ANALYSING THE DEVELOPMENT, MANANGEMENT AND GROWTH OF INTEGRATED DIGITAL COMMUNITIES

by

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A thesis submitted to
The University of Birmingham for the degree of
DOCTOR OF PHILOSOPHY

School of Electronic, Electrical
and Computing Engineering
The University of Birmingham
January 2003

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Introductory material and chapters 1 to 3

The remaining chapters and the appendices are in two additional files

Abstract

This thesis is concerned with understanding and describing the nature of 'community' within digital domains. A literature review indicates multiple media use within communities. The increasing range of personal and organisational technologies available suggests digital communities are more than just online communities. As such they require a new method of assessment.

The design of digital communities should be based on an understanding of 'community' in digital domains. Previous assessments, often focusing exclusively on the Internet, failed to recognise the ways in which technologies are integrated within communities. A new assessment method should allow the examination of integrated technology effects on communities through an analysis of important community features.

To assess digital communities a framework consisting of five headings was developed. The framework allows the effects of technologies to be examined across a range of communities. Taking a convergent methodologies approach five studies were undertaken covering a range of technologies and media integration issues.

The results suggest that digital communities are groups of people using technology to support their social interaction needs. Media use within digital communities is heavily integrated and the social needs of community members drive technology use. Designers should provide communities with flexible technology that permits integration and member adaptation.

To Moo for saving me and this

Acknowledgements

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Chapter 1

INTRODUCTION

The central argument of this thesis is 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. This chapter sets the context for exploring this argument. The increasing use of personal and organisational technologies is noted along with the increasing level of technology and media integration. A review of community offline, online and digital is carried out and it proposed that digital communities require a new method of assessment. Criteria for this assessment method are set out in preparation for the next chapter. This chapter sets out the aims and objectives of the thesis and a review of the original contributions of the thesis.

1 Context of thesis

"The social impact of new communications technologies is a greater number of social ties, more diverse social ties, more support. It doesn't cut into your phone communication. It doesn't interfere with your face-to-face contact. It just increases communication."

Hampton (2002b)

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; Wilbur, 1997; Weinreich, 1997; Galston, 1996) 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; Bowes, 2000; 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.

In contrast this thesis 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.

The role of technology within social interactions is increasing. More and more people are gaining access to the Internet. In the UK, 51% of adults access the Internet either at home, work, place of study or public access point (National Statistics Office, 2002). Digital technologies are changing the way in which companies operate, facilitating distributed offices and allowing employees to work from home. Information technology also promises a major transformation of higher education (Light & Light, 1999), with changes occurring in both co-located and distributed educational settings.
Coupled with this increasing access to organisational media is an explosion in the use of personal mobile technologies such as the mobile phone. The mobile phone, owned by

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three-quarters of the UK population (Oftel, 2002) is proving to be an instrument for social as well as task based interaction (Ling & Yttri, 1999).

There is now a wider range of technologies to examine in respect to the development and support of communities. This increasingly widespread array of personal and organisational technologies suggests new ways in which to conceptualise and study digital communities. It is proposed that technology and community are subtly intertwined and that their interaction allows the development of new forms of community. Within these digital communities members integrate a variety of technologies in order to support the development, management and growth of the community. Furthermore members seek to integrate their offline and online worlds so that technology-mediated interactions are supported by face-to-face interactions and vice versa (Hampton, 2002b; Etzioni & Etzioni, 1999). In this way technology not only provides the sole facility for creating community i.e. the context for community (Borovoy, 2002) but it can also provide a means of supporting existing communities and extending members` activities. In these integrated digital communities the seeming gulf between the offline and online world has been bridged.

1.1 Analysing digital community

The design of digital communities needs to be based on a proper understanding and analysis of 'community' in digital domains. Current analyses of technological effects on communities are hampered by disagreements as to what elements of community need to be studied. The lack of consensus regarding the definition of 'community' has made the examination of technology effects more difficult and has led to disparate findings and interpretations in relation to communities. The golden standard of face-to-face communication has meant that many of the more social aspects of technology-mediated communication have been overlooked or disregarded by researchers (Kraut et al, 1998). The persistent focus on the Internet has made it difficult to draw comparisons between different technologies and across different communities. This has resulted in the absence of a governing structure for the analysis of how and where different technologies affect

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communities. This has implications for designers of future technologies, community developers and in turn community members themselves.

A number of schemes for classifying online communities have been proposed (see Lazar & Preece, 1998). These vary in terms of their focus but most concentrate specifically on either the differences between offline and online communities or ignore the specific effects of the technology altogether by only highlighting generic similarities with offline communities. The schemes reviewed by Lazar & Preece (1998) are concerned only with online community. The notion of the Internet being the only digital technology to support community is quite pervasive. It serves to reinforce a gap between offline and online communities and does not permit a more detailed examination of media integration. It is argued here that a new analysis method is needed if a proper understanding of digital technology effects upon communities and their members' activities is to be gained. Only then can design decisions regarding digital communities be established.

A new assessment framework would allow the examination of combinations of technologies at various stages of development across different types of community. The framework would highlight explicit features of community that could be examined and compared across different digital domains. It will allow:

1) Comparisons to be made across the technologies and across a range of communities
2) Technology and media integration to be examined
3) Assessments of how and where to support communities with digital technology

1.2 Technologies of interest

Various collaborative technologies have been designed to support different kinds of communication, from informal to formal and from one-to-one to one-to-many conversations. Collectively such technologies are often referred to as Computer-Mediated Communication (CMC) technologies. The range of systems that support computer-

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mediated communication is quite diverse. Most computer-mediated communication tools have been developed to support distributed communication (Preece, 2000). Table 1.1 illustrates some examples of the different types of CMC technologies available. The technologies are classified according to four different structures. The first, a conventionally accepted classification system of CMC, is based on whether the technology supports either synchronous or asynchronous communication (Dix et al, 1993; Ellis et al 1991). The second classification feature is the level of organisation required to use the technology. Systems that support CMC in combination with other collaborative activities, for example, decision making are often used in a more organised less ad-hoc manner than other more informal CMC technologies. The third feature is the communication channel of the medium, for example, whether the technology supports one-to-one or one-to-many communication. The fourth and final classification structure relates to the mobility of the CMC technology.

Type	Sync*	Async*	Ad-hoc	Organised	One-to-one	One-to-many	Mobile	Fixed	Examples of each type of CMC technology
1		•	•		•			•	Email
2		•	•		•		•		Text messaging
3		•	•			•		•	Message board, email mailing list
4	•			•		•		•	Shared whiteboard (audio and chat)

Table 1.1 Classification of computer mediated communication technologies

*Synch refers to synchronous communication and async to asynchronous communication

Decisions regarding the choice of the technologies were based on three main criteria. The first was the availability of the technology. The second was that members of the communities themselves had to have access to the technologies and the third was that the technologies should allow a broad coverage of the classification features.

1.2.1 Message boards and email mailing lists

These are two of the most common forms of Internet technologies used in online communities. Message boards are based on the physical metaphor of a notice board in

which people can leave messages for others to read at a different time. Web based message boards allow asynchronous distributed communication in which users can read and post messages from anywhere at anytime. Messages can also be stored, searched, and threaded to show the relationships between individual messages. Email mailing lists allow messages to be broadcast to all list subscribers.

1.2.2 Shared whiteboards

Shared whiteboards are a typical form of groupware. Shared whiteboards allow synchronous information exchange via the whiteboard itself and via the supporting audio and in some cases chat channels. Digital whiteboards also allow the meeting record to be stored and subsequently retrieved on any digital whiteboard.

1.2.3 Email

Considered by some to be the only really successful groupware application. Email is a form of asynchronous communication and is a common medium within academia and within business settings. Email allows the transfer of text and attachments, which can include photographs, code and video animations.

1.2.4 Text messaging

Text messaging or Short Messaging Service (SMS) allows the exchange of messages up to 160 characters in length via mobile phones.

1.2.5 A note on methodology

Triangulation, in which different techniques are used to provide a global picture, is a useful technique for studying digital communities (Preece, 2000). The benefit of triangulation is that different techniques provide different lenses through which to examine the problem (Morse, 1994). In this thesis data is obtained from questionnaires, interviews, participant observation, data logging and message analysis. These methods

allow different levels of questioning to take place from open-ended, exploratory questions to the testing of specific hypotheses. A more detailed description of the methodological approach is given in chapter 2 section 2.5.1

1.3 Aims and objectives of the thesis

The aim of this thesis is to assess the effects of technology upon communities and to characterise 'community' within digital domains. This includes examining the ways in which technology affects the nature of communities and the activities of its members. To this end the specific objectives of the thesis are to:

- Explore the nature of community in digital domains
- Examine and categorise a range of technologies for community support
- Demonstrate the effect of technology use upon community activities
- Understand the extent of media integration within digital communities
- Devise and demonstrate techniques for characterising and comparing community in digital domains
- Relate community features to the design of services for communities

1.4 Overview of thesis
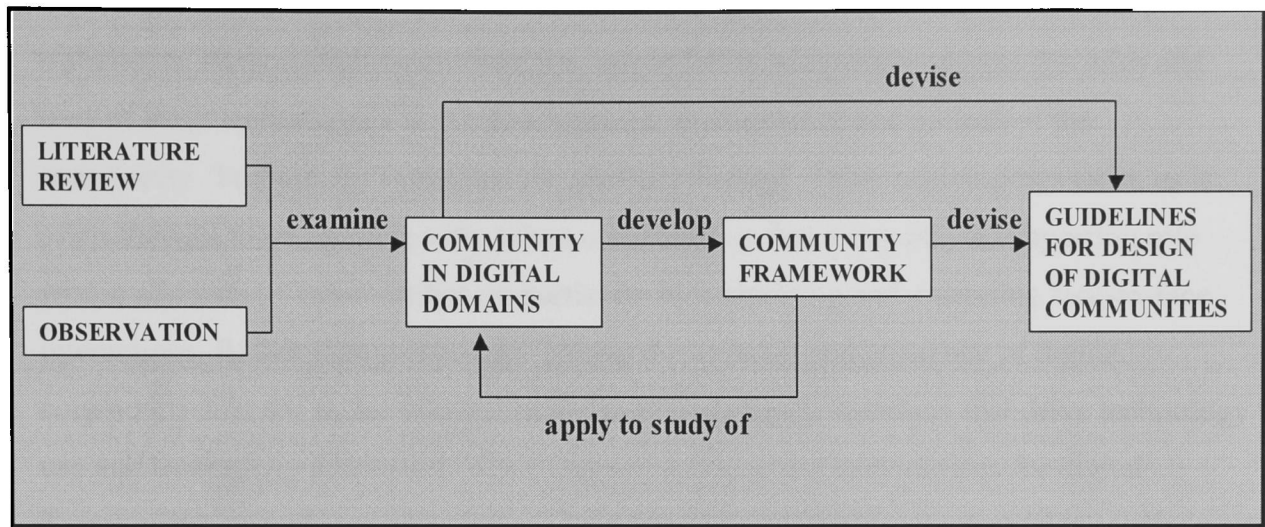
Figure 1.1 Overview of thesis approach

An overview of the thesis approach is shown in figure 1.1. Following this introduction a review of the literature on communities, online, offline and digital, is presented. In chapter 2 existing classification schemes for communities are reviewed and limitations identified. A five heading community framework is developed and presented. This is an advance on existing as it allows the characterisation of a greater range of digital communities, technologies and permits a detailed examination of media integration. The five headings of the community framework are presented in detail along with descriptions of the data collection process. Chapters 3 to 7 apply the framework to a range of communities examining the four technologies outlined earlier in this chapter. In chapter 8 a review of the thesis work is presented indicating where the objectives have been met and highlighting the important results. There is an analysis of the community framework along with considerations for future work.

1.5 Original contributions of the thesis

The central argument of the thesis is that digital communities are more than simply web-based communities. Digital communities consist of members using a variety of integrated technologies and media to fulfil their social interaction needs. In previous studies the

importance of media integration has not been recognised or explored. Media 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. Rather than technology driving the creation and existence of digital community it is the social interaction needs of community members that drive technology use and technology adaptation. The design of services and technologies for digital communities should recognise the need for flexible, adaptable and integration media. Exploration of these key arguments has resulted in the thesis offering the following original contributions:

- Production of a framework for characterising and comparing community in digital domains
- The design, development and application of a new SMS-web based interaction system
- Documentation and description of the role of a number of technologies, including personal mobile technologies in the development, maintenance and growth of digital communities
- Justification for the notion that a sense of community and community activities are supported and extended by technology and not only developed through it
- Demonstration and discussion of the role of integration in digital communities. This includes integration between technologies and across media.
- Examination of the adaptation of technologies by community members in particular the increasing use of asynchronous media in a synchronous manner
- Demonstration of the importance of social network factors in media use, across an increased range of technologies and settings

1.6 Exploring 'community'

The remainder of this chapter reviews the literature on offline, online and digital communities. The issues introduced in sections 1 to 1.3 are expanded upon. The literature review covers the existing work upon offline or physical communities and then describes the concept of online communities in terms of the changing place of community. The notion of digital community is then proposed and explored in greater detail. This provides an advance upon the existing work regarding online communities. It is proposed that digital communities are more than simply web-based communities. In particular the notion of integration within digital communities is set out. It is suggested that technology needs to be viewed within the context of the community's activities and members' daily lives. In preparation for the development of the new community framework in chapter 2, the notion of communities as social networks is introduced. The chapter concludes with an examination of individuals' perceptions of their own digital communities. This provides justification for the technologies chosen in this thesis and allows the concept of digital communities to be verified.

1.6.1 Defining community

Before being able to assess the effects of technology upon communities and to characterise 'community' within digital domains it is necessary to examine what is meant by the term 'community'. This is far from straightforward as the variation in describing and defining community is a well-studied problem within the social science literature.

The word 'community' is now a ubiquitous term. It appears in many different situations although its precise meaning remains somewhat elusive (Pereira, 1993). One of the difficulties in examining the term from a social science perspective is the number of diverse ways in which the term is commonly used outside the social science literature. It is used, for example, to describe a city or its inhabitants: "Brummies have a strong sense of pride in their Community" (Hamman, 1999).

Even within the social sciences, there is little agreement upon the definition of the term 'community' other than it is almost always used to describe a group of people. Poplin writes, *"As an element in the sociological vocabulary, this term has been used in so many ways that it has been described as an omnibus word."* (Poplin, 1979, p.3). Even the Penguin Dictionary of Sociology states that *"The term community is one of the most elusive and vague in sociology and is by now largely without specific meaning."* (Abercrombie, 1988). Over the last two centuries, the notion of community has altered according to the input of various socio-economical, historical and political factors.

Prior to the Industrial revolution societies had been largely based on kinship bonds and shared geography. Durkheim (cited in Hamman, 1999) refers to this as 'mechanical solidarity'. Following the industrial revolution, however, a number of changes took place within societal structure. There was mass economic migration away from the villages and towards the large cities. Communities became based upon common interest as well as shared geography, or as Durkheim put it 'organic solidarity', but not necessarily upon kinship bonds. Another pre-post Industrial revolution division regarding community was proposed by Tönnies in the 1920s. He made the distinction between Gemeinschaft and Gesellschaft, two German words, normally translated as community and society respectively. Gemeinschaft, normally translated as 'community', refers to the closeness of holistic social relationships said to be found in pre-industrial communities. Gesellschaft refers to the more instrumental, purposeful types of relationship typical of industrial society (Tönnies, 1971).

More recently, in the 1960s and 1970s, community was seen by some as a way of organising people who were interested in a specific cause. In the May 1968 revolution in France, the striking workers and students saw community as providing an alternative to capitalist consumerism (Barbrook, 1995). Political meanings and agendas are still attached to the term 'community'. In the current political climate the term 'community' is used as a 'feel good word' (McElvoy, 2000) and as a way of justifying actions.

In addition to the ambiguity imposed by the non-scientific usage of the term, definitions are also impeded by the ever-changing nature of the concept. The very social construct that it describes is continually changing and evolving (Fernback, 1999). Changes in the use of 'community' over the last century reflect differences in terms of who is using it, when they are doing so, and what their purpose is. The development of the written word, mechanisation, and alterations to the societal structure have all led to changes within communities and the ways in which we conceptualise them (Hamman, 1999). The term 'community' has dozens if not hundreds of distinct definitions in the social sciences. One of the most comprehensive attempts to assess agreement amongst definitions of community was carried out by George Hillery Jr in 1955. He subjected 94 sociological definitions of the term 'community' to quantitative and qualitative analysis. He found that only one concept was common amongst the 94 definitions: they all deal with people. Despite the difficulties, Hamman (1999) presents a clear and straightforward attempt at a definition: The term community refers to:

1) a group of people
2) who share social interaction
3) and some common ties between themselves and the other members of the group
4) and who share an area for at least some of the time

Hamman's (1999) definition of community is useful in that it provides a focus on communities that involve social interaction rather on 'community' as a term in everyday usage. The definition is also simple and clear enough to permit the acceptance of digital as well as physical communities.

Social interaction is key to people developing a sense of community (Chavis et al, 1986). Common interest may bring people together, but it is interaction that leads to the development of shared culture and 'human feeling' (Rheingold, 1993). This human feeling or 'sense of communion,'(Watson, 1997) leads to commitment and a stake within a community.

The terms 'community' and 'communication' both stem from the same Latin root *communis*, meaning common (Watson, 1997). Indeed, communication is vital if communities are to develop. A group of people located in one place does not guarantee the development of a community between those people. Nor is it enough to say that a group of people with a common interest always becomes a community. Steve Jones (1997) argues that genuine communities provide places to be *among* others, such as the bus stop, but also to be *with* others and provide opportunities to engage in conversation, which is not necessarily goal oriented. A common interest, or affinity, must bring people together strongly enough to engage their interest in an ongoing discussion.

1.6.2 Being in a community

It has been said that 'community' is a word that never seems to be used unfavourably (Williams, 1976). Whilst this is almost certainly an exaggeration, the generally favourable usage of the term stems from the fact that community like culture has prima facie moral and social benefits (Selznick, 1996). The emphasis on creating community across a range of settings is fuelled by research that reveals a number of positive benefits for individuals and the communities to which they belong. Strong interpersonal ties increase willingness to share information and resources (Haythornthwaite et al, 2000; Argyle, 1991). Trust in the community fosters contribution and support in times of need (Haines et al, 1996). Being part of a community also offers members a sense of belonging and a feeling of empowerment including actual social influence, political power or financial equality (Rappaport, 1987).

1.6.2.1 Public perceptions of community

" Community is a term which seems readily definable to the general public but that is infinitely complex and amorphous in academic discourse."

Fernback (1997 p39)

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In a 1997 survey the American Association of Retired Persons (AARP) explored community understandings and practices in the USA (Guterbock & Fries, 1997). 1500 respondents were asked to explain what came to mind when they thought of 'their community'. The results made it clear that for most people community is still a territorial concept. However, young adults, aged 18 to 30, were significantly less likely to cite location based and formal organisations than older adults. The young adults cited more informal organisations such as friends and social relations, school communities and recreational or sports groups. The following personal communications describe a similar trade off between geographical location and interest-based communities in young adults in the UK. The first definition represents a traditional view of community. The second quote represents the ideas of location and interest based communities.

> " a group of people who interact with each other for social or business reasons due to some common factor typically geographical location, religion or homosexuality."
> (Male, 23)

> "The first is a group of people living together. I immediately think of a minority group, ethnic, or a commune or something. The second definition is a group of people with similar interests, which have brought them together. These interests can be anything from bird watching to Pokemon. Both kinds of community, I think, are similar in that they maybe have some kind of common cause that binds them together." (Female, 24)

1.6.2.2 Community activities

Interactions within communities fulfil a number of functions. According to Rheingold (1993), activities within communities include exchanging ideas and knowledge, making plans, brainstorming, conducting commerce, gossiping, feuding and making friends. Preece (2000) suggests that the purpose of a community can involve any or all of the following high-level tasks (p.114).

Exchange information: The primary goal is to get answers to questions or to send out information. This can be unidirectional or multidirectional.

Provide support: Different from information exchange this task involves conveying empathy, which involves expressing emotion verbally or non-verbally.

Enable people to chat and socialize informally: Generally requires synchronous communication (whereas the first two can be achieved asynchronously). Socializing is likely to involve light hearted, short comments among several people.

Discuss ideas: May involve writing several paragraphs. Discussion may become heated or go off-topic.

Within communities members are variously engaged in some or all of these activities. Not all activities will exist within all communities and members' activities depend on the nature of the community and its stage of development. In order to meet the thesis objective of demonstrating the effect of technology use upon community activities, Preece's (2000) activities, listed above, will be used as a starting point. Preece's (2000) activities are specific to online communities and therefore it may be necessary to expand upon these activities with respect to the different technologies.

1.6.2.3 Summary

Explorations of physical community have indicated that there is little agreement in terms of defining community. Definitions depend on who is using it, when they are doing so, and what their purpose is. Social interaction within communities is vital and public perceptions of community relate to location and common interest. The benefits of community membership have been explored and a number of activities have been identified for use within the thesis.

1.7 Technology and community

Communication is at the heart of geographically based communities. It is surely as important if not more so in communities mediated by technology, where socio-emotional content, gestures and facial expressions are masked. In the second part of this chapter the nature of community within digital domains is introduced. Technology and community have a long history together (Rheingold, 1999). More recently the debate about the

influence of technology upon community has been re-ignited by the proliferation of online communities. Understanding the nature of community in digital domains may not be so different from understanding the nature of community per se. This part of the chapter reviews the interaction between community and technology.

1.7.1 Technology and community – An historical overview

Communication technologies have been changing the nature of communities for nearly 10,000 years (Rheingold, 1999). Alphabets and scripts for printed communication altered the way individuals, communities and societies conducted relations and organised themselves. Eisenstein (1979) notes that, prior to Gutenberg's invention of the printing press in the 1450s, getting the news was a community event. People would gather in the town square to hear news from travellers and messengers and discuss these events with each other afterwards. When printed newssheets became available people would retreat to read the news in private. This destroyed a certain kind of local community yet opened up connections to a wider variety of people. People began to identify with others who were not geographically close and ideas and affinities spread more quickly (Eisenstein, 1979). Whilst the written word made it possible to communicate with people at a distance, the speed of the communication often proved problematic. The telegraph solved this problem (Standage, 1998). It allowed people to communicate almost instantly across great distances, altered business practices, allowed new types of crime to develop, inundated people with information and allowed romance to blossom.

The decline of the telegraph and the introduction of the telephone in the 1870s brought about further increases in communication speed. The telephone allowed direct conversation between two speakers without the intervention of a third party as with the telegraph. The telephone altered relations between businesses and their customers and between community members, families and friends (Pierce, 1976). Currently, the Internet provides a popular focus for examining how communities are being affected by and are themselves affecting communications technologies. The Internet began as a computer network of ARPA (ARPAnet) that linked computer networks at several universities and

research laboratories in the United States. In 1983 ARPAnet split into two separate networks, ARPAnet and MILNET. A computer on ARPAnet could exchange information with a computer on MILNET by routing the data through a gateway computer, thus forming a network of networks called the Internet (Rheingold, 1993). Different sorts of programs use the Internet, for example email and the World Wide Web (WWW) or web. The web was developed in 1989 by English computer scientist Tim Berners-Lee to allow people to work together by combining their knowledge through interconnecting hypertext documents, forming a 'web'. In addition more advanced forms of groupware such as videoconferencing and shared whiteboards are making new forms of work-based communities possible. The recent growth in the use of personal mobile technologies such as the mobile phone also suggests new ways in which technology and community can interact.

1.7.2 The changing 'place' of community: Online communities

Given the positive associations with the term community in both its everyday and sociological usage it is not surprising that many lament its loss in the post-modern cities and suburbs of Western societies (see for example Putnam, 1995). Communities used to conjure up images of a homogenous group of people fulfilling social, employment, schooling and functional needs. People now belong to multiple communities each fulfilling many different needs (Ward, 1999). Rather than associating local geographic area with community, communities can be seen as social networks of people existing in a variety of different locations.

Wellman has described in some detail the shift away from communities based upon geographic areas towards private network communities (Wellman, 1999a; Wellman & Hampton, 1999). Instead of gathering in parks and cafes, people now chat with their friends via email and the telephone or else attend small gatherings in private homes. Oldenburg (1991) has also lamented the loss of public community spaces, or as he calls it, the "third place". Whilst Oldenburg and others, for example, Meyrowitz (1985), suggest that the loss of community spaces has meant the loss of the communities

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themselves, Wellman argues that the community's interactions have simply moved from public, physical spaces into spaces created by new technologies.

Increasingly it is being recognised that online environments contain numerous virtual places within which communities develop and grow. The labels given to the online locations where people can interact highlight the role that virtual places can play in providing a context for community discourse. These include chat rooms, conferences and settlements. Descriptions of online communities often include the notion of location (Preece, 2000; Fernback & Thompson, 1995). Ito et al (1999), for example, describe community sites as being *"places on the Internet that provide distinctive locations for sustained social interaction among repeat participants."*

Online meeting places vary in the extent to which they provide a physical metaphor. At the simplest level, online locations are just persistent web locations that guarantee a record of transactions involving like-minded individuals. Other locations use place as a physical metaphor. In chat rooms, members navigate between different locations as if travelling between different rooms. In Multi User Domains (MUDs), people can create and design their own locations (Curtis, 1992). Chat rooms and MUDs are both text based communities in which place is created by the interaction of its members. As Jones (1995) pointed out *"computer-mediated communication is, in essence, socially produced space"* (p.17). The design of some online meeting places is more complex and involves the recreation of physical places. These physical places can be real geographical locations in the case of online community networks or can be recreations of fictitious places. An online fan community built around the Radio 4 soap opera The Archers has designed a number of different locations in which members can interact. One of the most popular locations is The Bull. This is an area, which represents the public house of the same name on the radio program.

The notion of location is still important when considering mobile technologies. The introduction of devices such as Personal Digital Assistants (PDAs), mobile phones and associated communication technologies such as text messaging allows community

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members to interact away from a fixed location by connecting their locations wherever they are. Communication partners often still detail their geographical locations to each other. This establishes mutual contexts for communication and enables a sharing of circumstances between the two parties (Laurier, 1999; Bevan, 2002). Mobile technologies may support the existing, physical location of the community by helping to arrange group meetings at the shared meeting place.

One of the questions examined in this thesis is whether a technology has to create a place for a community to exist or whether it can support the existing place of the community in a number of different ways? Understanding the role of place and location in shaping discussions within digital communities is important. An assessment in terms of location provides a broad characterisation of a community and location is to be included within the framework developed in detail in chapter 2.

1.8 Digital communities: re-examining the community debate

Recently the Internet has provided the most common focus for examining the relationship between technology and community. The arguments surrounding so-called online communities not only serve to re-ignite the debate over the meaning of community but also suggest a new direction for research. This thesis advances existing work upon online communities by introducing the concept of digital communities. In this section the arguments in support of the notion of digital community are presented. In particular the idea of media integration as an aspect of technology use within communities is examined.

Opinions regarding the social impact of the Internet depend to a large extent on the way in which community is perceived outside of face-to-face interactions and the perception of separation between online and offline worlds. Those suggesting that increasing immersion in online activities is destroying real social interaction and community (Putnam, 1995; Wilbur, 1997; Galston, 1996) argue that mediated contact cannot constitute community. They maintain that CMC cannot substitute for the sensual experience of meeting one another face-to-face. Weinreich (1997) argues that the

fundamental elements of community such as shared norms, limited membership, affective ties and mutual obligation are not found in online groups supported by mediated contacts.

In applied studies, the perception of community existing outside of the physical world has a direct effect on both methodology and results. Online environments are still considered by many to be outside the realm of real community. The HomeNet study (Kraut et al, 1998) makes this assumption. The authors examined the social and psychological impact of the Internet on 169 people in 73 households during their first two years online. They found that the Internet increased social isolation and feelings of loneliness. In addition, the authors report decreased communication with family members and a decline in participants' social circles. Participants had had no prior access to computer networks from their homes and were given free computer equipment, Internet access and training. A number of researchers have questioned the validity of the HomeNet findings (Hamman, 1999; Rosenburg, 1998). They point out that the sample population consists of people with no prior experience of the Internet who might have a very different motivation for going online compared with other users. The findings also rely upon just two sets of questionnaire results over the two-year study period. Finally, they note that offline communications were always perceived by the researchers to be more positive than any online relations. Changes in social interaction were measured in terms of changes to offline interactions only. The authors did not count social encounters online as real social interactions.

1.8.1 Integration within digital communities

In the HomeNet study the researchers assumed a total separation between the household members' online and offline worlds. In studies where this assumption has not been made and media integration has been recognised and accepted, the Internet has been found to be part of people's everyday lives. 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, 1995a; 1995b; 1998; Patterson, 1996; Reid, 1991; Watson, 1997; Ito et al 1999; 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; Katz & Aspden, 1997). 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.

Technology penetration across a range of settings is increasing. CMC technologies and more sophisticated forms of groupware are changing the way in which organisations operate, academic courses are run and the way in which people maintain contact with friends and family (Sproull & Kiesler, 1990; Light & Light, 1999; Wellman & Hampton, 1999). Recent developments in collaborative technologies have made both distance and co-located working and learning easier. Many meeting support tools, such as audio and videoconferencing, are designed to mediate the dominant conversation (Stefik et al, 1987). Other tools are more concerned with building information and context around the community either at the development stage (e.g. Nishibe et al, 1998) or to maintain community awareness (Greenberg & Rounding, 2001; Sawhney et al, 2001). Borovoy et al (1998; 2001) have designed new technologies to encourage and support the development of face-to-face groups. The technologies are specifically concerned with developing a sense of common ground amongst potential members of a community and helping them to reflect on their own complex patterns of interactions.

Increasing access to organisational media, the Governmental drive towards universal Internet access (UK Online, 2000) and the increasing ownership of personal mobile technologies means a wider array of technologies are 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;). 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; Hampton, 2002b; Lazar et al, 1999; Suler, 2000, Adams et al, 1993).

1.8.2 Digital communities- an advance on existing work

This thesis presents a new approach to the study of technology and community. It provides an advance upon the existing work regarding online communities. The thesis proposes that digital communities are more than simply web communities. They are communities whose members use various technologies in support of their communication and interaction needs. These technologies support their activities and sense of community. Technologies such as the web, email, mobile phones and television are integrated into the community often in conjunction with face-to-face interactions. Rather than viewing technology as separate from communities it needs to be viewed within the context of the community's activities and members' daily lives.

1.9 Examining digital communities

One way of examining technology use within the context of communities and their members' activities is to studying communities as social networks. In this section the concept of communities as social networks is introduced. The public perception of digital communities is also investigated. This will allow verification of the proposed technologies of interest and of the concept of digital communities itself.

1.9.1 Social network theory and technology use

Studies of traditional communities have revealed that communities are clearly networks (Wellman & Hampton, 1999). People's communities consist of dispersed kinship, workplace, interest and neighbourhood ties, which together form a network of supportive ties. Social Network Analysis (SNA) is a frequently used method for exploring the nature of community. It has shown, for example, that among Toronto residents, a sense of community is maintained through ties, rather than through geographical proximity (Wellman & Wortley, 1990). Wellman (1997) has suggested that when a computer network connects people it is a social network. As such he argues that social network analysis might be useful for understanding how people relate to each other through computer mediated communication.

Social Network Theory (SNT) (Haythornthwaite, 1998; Wellman, 1997) suggests that interactions rather than task-media fit are key to technology use within groups. The social network approach considers the interactions that occur between people as being the building blocks that determine social behaviour. Thus to understand how people form communities, work together or gain access to information it is necessary to examine the types of interactions in which they engage. SNT argues that information exchanges are social interactions. The nature of information exchanges is constrained by the types of relationships people have as well as the types of media available. Exchanges are also affected by the kinds of information to be exchanged and the norms that are in operation (Haythornthwaite & Wellman, 1998).

1.9.1.1 Social network analysis

Social network analysis examines relations between actors in a network. Actors are usually individuals but can be larger units such as organisations and families. Relations are characterised by their content, for example, information exchange or emotional support and their direction and strength. Individuals who maintain the relation are said to maintain a tie. The more relations in a tie, the more multiplex the tie. Social network

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analysts have found that multiplex ties are more intimate, voluntary, supportive and durable. Within social networks a range of strong and weak ties exist. Ties that are weak are generally infrequently maintained, non-intimate connections, for example, between co-workers who share no joint tasks or friendship relations (Granovetter, 1973). Strong ties include combinations of intimacy, self-disclosure, provision of reciprocal services, frequent contact, and kinship, as between close friends or colleagues.

1.9.1.2 Types of communities

A set of relations or ties reveals a social network (Garton et al, 1997). By examining patterns of relations or ties, analysts are able to describe social networks. Typically analysts approach social networks in two ways. One approach considers the relations reported by a focal individual. These ego-centred (or "personal") networks provide views of their networks from the people at the centres of their networks. This ego-centred approach is particularly useful when the population is large, or the boundaries of the population are hard to define. The second approach considers a whole network based on some specific criterion of population boundaries such as a formal organisation, department or club. A whole network describes the ties that all members of a population maintain with all others in that group. The social network approach to communities allows a picture of the community to be built up. It provides an overview of members, relations and technology use. It provides a broad characterisation of a community and is one of the assessment techniques to be included in the framework developed in detail in chapter 2.

1.9.1.3 Social network diagrams and notation

Social network diagrams provide a visual representation of the group's communications. In these diagrams (see figure 1.2 for an example), community members are displayed as numbers and the connecting lines indicate communication direction. Where the frequency level of the exchanges is an important aspect of the diagram the number of messages is made explicit. In online communities messages can be targeted at a specific individual or

can be directed towards the whole group. These notational features are presented in figure 1.2 below.
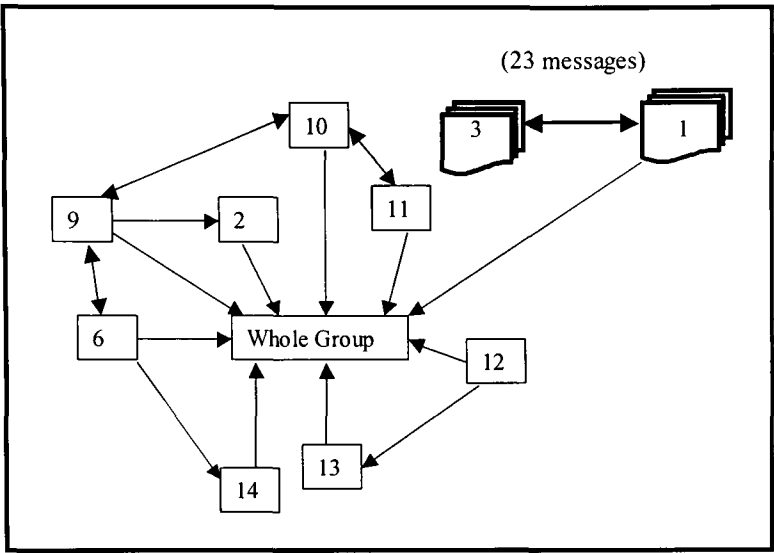
Figure 1.2 Example of social network diagram and notation

1.9.2 Public perceptions of digital communities

To start to investigate the role of digital technology within communities a simple exercise with a group of students was performed. 35 postgraduate students were given five minutes to sketch out their communities giving an indication of the members involved, how they communicated with them and how often. The purpose of this exercise was two-fold. Firstly, to investigate and verify the concept of integrated digital communities and secondly, to justify the technologies to be studied within this thesis. This meant an examination of whether the technologies to be studied corresponded to technologies that people were actually using in their communities.

The diagrams (see figures 1.3 and 1.4, for examples) revealed a number of interesting points regarding the nature of community and the role of digital technology within those communities. The diagrams confirmed that people use a range of technological support within their communities. The diagrams also showed that communities consist of a

mixture of face-to-face and technology mediated interactions. They also indicated that notions of community are perceived and constructed differently by different people.
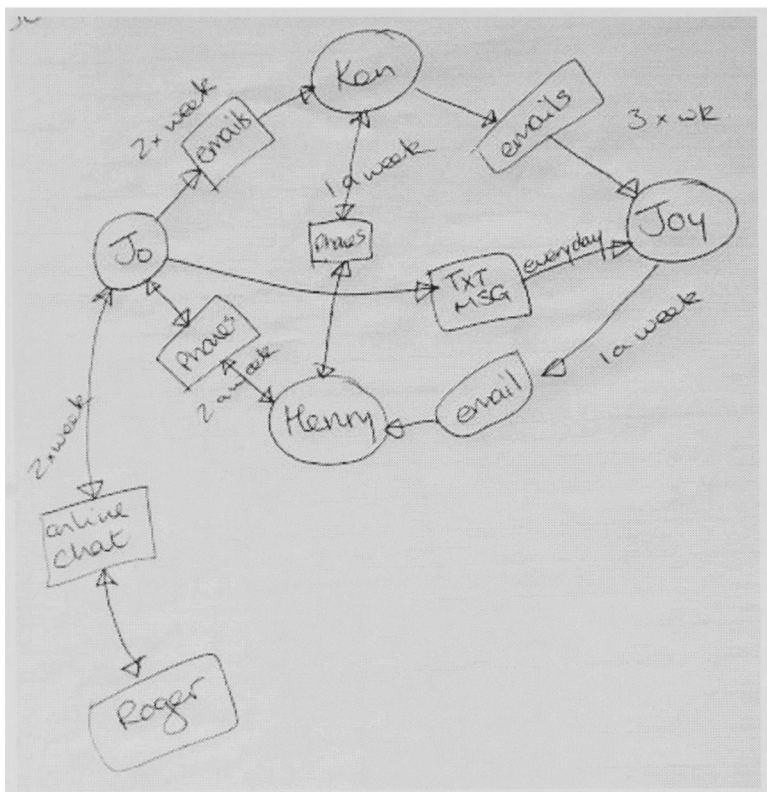
Figure 1.3 Digital community diagram (1)
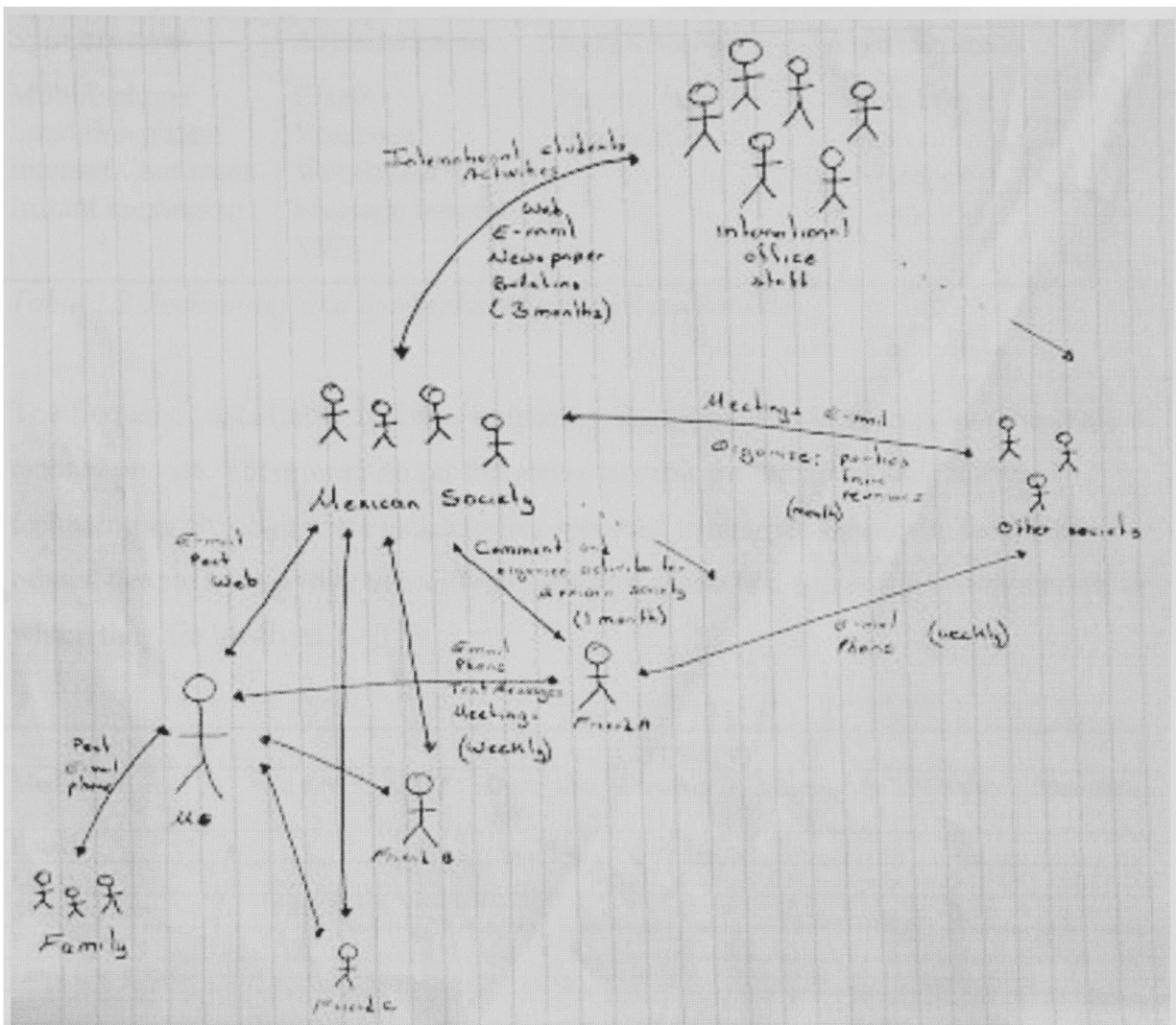
Figure 1.4 Digital community diagram (2)

The diagrams contained a range of technology and non-technology mediated interactions. The technologies mentioned (see table 1.2) included SMS, mobile phones, email, and message boards. This confirms that the technologies to be studied within this thesis are the technologies that people are actually using in their communities.

Technology based		Non technology based	
Synchronous	**Asynchronous**	**Synchronous**	**Asynchronous**
Mobile phone Land line phone Internet Chat room Instant messaging	Email Voicemail Web-based Message boards SMS	Face to face meetings	Notice board Letters Newspaper bulletins

Table 1.2 Technology and non-technology based mediations

The frequency data (table 1.3) also supports a non-deterministic approach to the study of technology use. There were no set frequency patterns for the use of the different technologies although some technologies appeared to be more frequently used than others. People have settled into different patterns of use that support the communities in which they are involved.

	Frequency						
Mediation	>1 a day	Daily	Every few days	Weekly	Fortnightly	Monthly	3months
Email		5	10	12		3	
Letter				4		5	1
Mobile phone	10	11	6	4		3	
Face-to-face	5	17	8	5			
Land line phone			3	10	9	6	
SMS		28					

Table 1.3 Frequency data for the different forms of mediation in the diagrams

The diagrams also indicate that people construct the notion of community and their communities in a variety of ways. Figure 1.5 shows differences between the constructions of community networks. The students were not given any instruction as to how to assemble their diagrams yet they show a remarkable similarity with the notion of social network diagrams described earlier in the chapter. Within the students' community diagrams there were examples of both ego-centred networks and whole or relational networks.
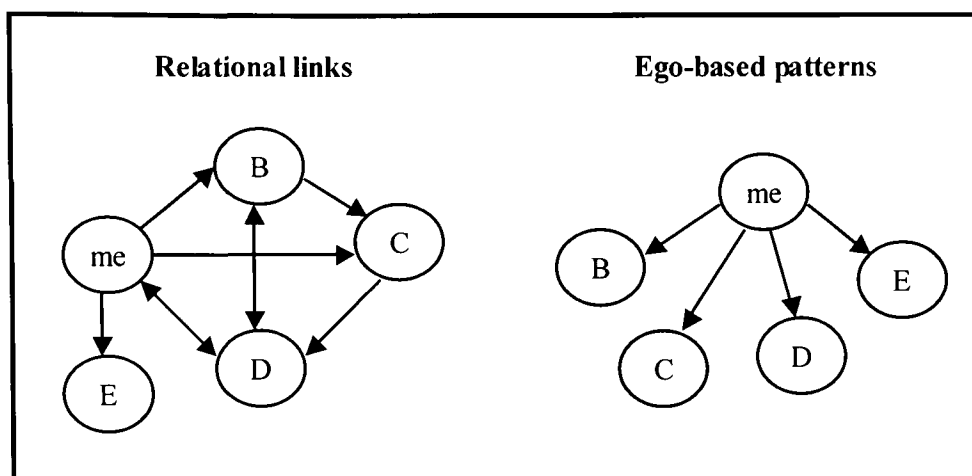
Figure 1.5 Network diagrams indicating two different types of community network

1.9.2.1 Summary of findings from community diagrams

The diagrams provide support for the notion of integrated digital communities. They indicate that people use multiple media within their communities. These media are integrated and support different types of relations and networks across different time scales and within different locations.

The diagrams also provide support for the different types of technologies to be studied within this thesis. Internet technologies, email and SMS all appeared frequently within the community diagrams. The absence of more complex forms of groupware such as shared whiteboards is not surprising given the fact that such technologies are still relatively novel within student academic settings. The diagrams portray a range of different types of community and suggest at least two different ways of studying communities. Either a relational approach in which all interactions within a community are examined or a ego-based approach in which individuals are used as the starting points of their own communities.

1.10 Chapter Summary

The central argument of the thesis is that digital communities are more than simply web-based communities. A number of limitations with current portrayals of technology and community interactions have been identified. These include an increasing array of

personal and organisational technologies, increasing technology use within communities and finally the integration of online and offline interactions. It is proposed that digital community is a more appropriate term to describe technology and community interactions. Digital communities consist of members using a variety of integrated technologies and media to fulfil their social interaction needs. The exploration of the notion of digital communities is presented as an advance on existing work. Digital communities require a new method of assessment and in this chapter the requirements of a new method of assessment have been outlined. Location and social network have been identified as two important aspects to examine with respect to digital community. The digital technologies, chosen to be studied, within the thesis were described. A study of public perceptions of digital communities provided support for the technologies chosen and for the concept of digital community itself.

Chapter 2

CHARACTERISING AND ASSESSING COMMUNITY IN DIGITAL DOMAINS

This chapter describes the development of a new community framework for analysing and comparing digital communities. The framework consists of five headings. Two of these, social network and location, are incorporated from chapter 1. The remainder of the chapter focuses on the development of the other three framework headings, membership, organisation and integration. The whole community framework is then presented. Measures for each of the headings along with data collection techniques are described.

2 Introduction

In chapter 1 the literature on community was reviewed and digital community was proposed as a more accurate description of technology and community interactions. Digital communities require a new method of assessment and in the last chapter the requirements of a new method of assessment were set out. In this chapter a framework for characterising and assessing community in digital domains is developed. It combines the broad characterisation techniques of social networks and location identified in chapter 1 with a number of more specific characterisations.

2.1 Beyond definitions

The discussions in chapter 1 made it clear that use of the term 'community' depends upon who is using it, when they are doing so, and what their purpose is. Any characterisation of community needs to take into account that it is not a uni-dimensional idea but consists of multiple variables or attributes. Describing communities in terms of their attributes is one of the ways in which online community researchers have tried to extend the

description process beyond definitions in terms of making a useful contribution to the design and development of different kinds of online communities. Lazar & Preece (1998) have reviewed a number of types of classification schema for online communities. These include, in full, those based on: a) attributes b) supporting software, c) relationship to physical communities and d) boundedness.

2.1.1 Classification in terms of attributes

Community is a multidimensional construct and a few researchers have sought to identify the important features or attributes of community as a way of defining online community (see for example, Whittaker et al, 1997). Communities are built upon webs of affect-laden relationships (Etzioni & Etzioni, 1999). In order to build such relationships, members have to actively participate in the development of shared resources, context and ultimately a shared community history (Selznick, 1996; Whittaker et al, 1997; Carroll & Rosson, 1996). Importantly, members need to be able to identify with the community at one level whilst still being able to see the effect of their individual influence. People feel that they belong because they have invested part of themselves in order to belong (Chavis et al, 1986). A shared emotional connection is important (Rheingold, 1993; Chavis et al, 1986) and there is a need for a sense of mutuality or reciprocity of information and support (Selznick, 1996; Whittaker et al, 1997). Relationships within communities need to be multiplex (Wellman & Gulia, 1999). This multiplexity or plurality (Selznick, 1996) means that different ties exist between different members. As relationships grow stronger so the more multiplex they become (Haythornthwaite, 2001). Communication partners extend their relationships beyond work-based interactions to social and emotional support.

In addition to those attributes concerned with developing affect laden relationships, there are other attributes pertaining to the logistics of the community. These include the issue of member control, i.e. whether or not community members can decide policies, rituals, protocols and rules themselves (Preece, 2000). Other attributes identified include the

different roles and reputations of people in those roles, the long duration of community existence and voluntary membership (Whittaker et al, 1997).

2.1.2 Classification in terms of supporting software

Online communities can be classified in terms of the software that supports them. This software includes, bulletin or message boards, mailing list technology and Internet Relay Chat (IRC). Indeed, online communities are often designed around a specific technology (Preece, 2000). Lazar & Preece (1998), however, point out that many online communities are supported by a combination of online communication tools.

2.1.3 Classification in terms of relationship to physical communities

The most common perception of online communities is that of anonymous interaction between groups of geographically dispersed people. A number of researchers have noted that this is not the only model of online community. Online communities differ in their relationship to physical communities. Aoki (1994), for example, proposes three types of online communities; those that are based on physical communities, those that are somewhat based on physical communities and those that are not related to any physical communities.

Online communities based upon physical communities are geographically focused. These communities are based on news, events, people and locations in the physical community (see for example the Blacksburg Electronic Village, Carroll & Rosson, 1996 and Cleveland FreeNet, Schuler, 1996). Members of online communities that are somewhat based on physical communities may meet face-to-face periodically through their shared interest in a research topic, hobby or sport (Lazar et al, 1999). Finally online communities that are unrelated to any physical communities usually have no face-to-face meetings.

2.1.4 Classification in terms of boundedness

The concept of boundedness relates to how many of the social relationships remain within the defined population of the group or the community (Wellman, 1997). Within organisations social networks are often tightly bounded and interaction is limited to those people working for the company. In a loosely bounded community, members have more social ties with people who are outside of the defined community. The Internet is an example of a loosely bound network. Communication can take place between anyone in any number of communities around the world.

2.1.5 Limitations of classification schemes

The classification schemes reviewed by Lazar & Preece (1998) are a useful first step in clustering together similar types of online community. The different schemes, however, do not allow a very detailed analysis of the communities to take place. They tend to either draw comparisons between offline and online communities, or ignore the specific effects of the technology altogether by only highlighting generic similarities with offline communities. All of the classification schemes are only concerned with online communities and provide little in terms of in-depth descriptions. The reviewers themselves, however, note that even some online communities are using multiple technologies in support of their activities and highlight examples of online communities which are starting to bridge the divide between online and offline realms. Characterising and comparing different types of digital community requires a more detailed assessment framework which allows:

a) comparisons to be made across the technologies and across a range of communities

b) media integration to be examined

c) assessments of how and where and to support communities with digital technology

2.2 Characterising community in digital domains

An assessment framework for characterising community in digital domains should take a broader perspective on digital communities above and beyond the simple notion of online or virtual communities. It is hoped that by developing and applying such a framework to the study of digital communities it becomes possible to assess the effects of each of the Computer Mediated Communications (CMC) technologies described in table 1.1 across a range of communities. The framework will also allow a detailed investigation of the concept of media integration within communities. In the debate over offline versus online communities the notion of integration is often lost. A few researchers have noted that offline and online worlds are not and need not be so separate. Etzioni & Etzioni (1999), for example, have argued that communities that combine both face-to-face and CMC systems would be better able to bond and share values more effectively than communities that rely upon only one or the other mode of communication. Hampton (2002b) has found that communication online leads to more communication, in person or on the phone. Other researchers have developed technologies that seek to develop, support and augment face-to-face interactions or 'co-present' communities (Borovoy et al, 1998; 2001; Rheingold, 2002).

2.2.1 Combining broad and specific characterisation techniques

In Chapter 1, two broad assessment techniques for characterising community were described. These were characterising community in terms of its social network and characterising community in terms of its location. Assessing community in terms of its location allows a high-level general description of the community to be developed. Assessing community in terms of its social networks allows a picture of the community to be established. Different types (networks) of communities are going to use technology in different ways and different technologies will support the formation of different social network patterns.

In this chapter, a number of more specific assessment techniques are developed.

The attributes are grouped into two meaningful components which are then incorporated into the framework. The final element of the framework is an assessment of community in terms of its integration. This builds upon the description of integration described in chapter 1. The development of the specific assessment techniques is described below. All the elements of the framework are then combined and presented at the end of the chapter.

2.3 Community attributes and components

As described earlier, attempts to produce a single all-encompassing definition of community would result in the complex and evolving nature of community being eroded. Community is a multidimensional construct. Taking a different approach, this study seeks to identify the important features or attributes of community. However, rather than using attributes to define community (see for example, Whittaker et al, 1997), this study uses the attributes to provide two components for the community framework for characterising digital communities in greater detail. The attributes provide a way of analysing the specific effects of a given technology upon a community and allow an analysis of the way in which that technology supports that community. This in turn can then be used to make an assessment of the type of digital community under investigation.

It is important to note that the framework allows for differences and similarities between different communities to be identified. It is not a recipe or a set of rigid specifications for community. Whilst it is possible to say in general terms that communities are characterised by the attributes identified in the analysis, it is important to remember that not all communities possess every attribute. Different features vary in prominence within the different communities.

2.3.1 Overview of study method

The aim of this study was to group together important community attributes to produce useful community components which could then be incorporated into the community framework. The study consists of three phases. The first involves selecting the attributes,

the second involves rating the importance of the attributes to a number of communities and the third involves grouping the attributes.

2.3.2 Selecting the community attributes

The selection of the attributes was based on two main sources of data. The first was a review of the theoretical literature concerning definitions of 'community' (e.g. Chavis et al, 1986; Selznik, 1996; Smith, 1992; Schwier, 2002; Whittaker et al, 1997; Pereira, 1993). A review of specific case studies was also carried out in order to identify any additional attributes (e.g. Carroll & Rosson, 1996; Wellman & Gulia, 1999; Baym, 1998; Haythornthwaite, 1998, Rheingold, 1993). The community attributes were described earlier in the chapter in section 2.1.1. The original search produced 18 attributes. Some of the attributes were felt to be different descriptions of the same construct. Where this was the case, for example, enduring and ongoing community only one (the one more widely referenced in the literature) was kept to represent this feature of community. The 12 final, separate attributes are shown in table 2.1. All the final attributes were referenced by at least two published papers. Previous research is referenced where appropriate and full citations appear in the bibliography.

Attributes	Description	Reference
Multiple Relations	Members are connected by a number of different ties. They communicate about many different topics and for many different reasons	Haythornthwaite 1998; Garton et al 1997
Voluntary Membership	Being part of the community voluntarily	Stewart 1996; Whittaker et al 1997
Informal communication	Communication that is less structured and less explicitly goal based	Wellman & Gulia 1999; Selznik 1996
Ongoing community	No obvious time limit on the duration of the community	Chidambaram 1996; Smith 1992
Opportunity for personal investment	Members can invest time/content in the community and have an emotional commitment to the community. Opportunities for participation and reciprocity	Chavis et al 1986; Selznik 1996
Shared history/context	The community has ability to recall and/or record its own history thus building up a shared context amongst members	Carroll & Rosson 1986; Whittaker et al, 1997
Strong human feeling	Strong sense of personal regard for fellow members	Rheingold, 1993; Watson 1997
Sense of Identification (social identity)	Strong feeling that one belongs to the community and is a member. Identification is a means by which community members define the self in relation to the community	Turner 1987; Selznik 1996
Member control	Members have control over membership issues, activities and decisions about their community	Hattori et al 1999; Schwier 2002; Chavis et al 1986
Provided content	The 'site' provides information and advice. Members can use the site to gain information and answer questions	Preece 2000 Kim 2000
Homegrown experts	Diverse background of members ensures that there are plenty of unofficial experts within the community. This occurs, for example, in SeniorNet	Preece 2000 Howse 2000 Ito et al 1999
Member generated content	The community members generate the content of the site e.g. in the ACL group	Preece, 1998; Misanchuk & Anderson 2001

Table 2.1 Community attributes

2.3.3 The communities

Table 2.2 shows the twenty-five communities, both online and offline that were reviewed in terms of the attributes. A description of each community can be found in Appendix A. The web-based communities included SeniorNet a site for the over 50s and a web-based learning group. The offline communities included a Christian Union group and a group of University classmates. Offline or physical communities provide a well-researched standard by which to compare and contrast online communities. A wide selection of communities was chosen with the intention of covering a range of interests and ages. Additionally, the selection covered both male and female dominated communities and a

range of community locations. The selected communities were either well researched with published analyses or the author had in-depth personal knowledge of them. A number of the communities (epinions and consumerreview) were included at the request of the sponsor.

	Community	Reference		Community	Reference
1	SeniorNet	Ito et al (1999)	14	SeniorCom	www.senior.com
2	Christian Union		15	Barton Neighbourhood	
3	ParentSoup	Trabak (2000)	16	Phish.net	Watson (1997)
4	Rats	Baym (1995b)	17	Alt.good.morning	Patterson (1996)
5	Stop smoking	Uzark et al (1997)	18	Ivillage	
6	University Classmates		19	Ebay trading groups	Kollock (1999) Alevizou (1999)
7	Long distance learners	Haythornthwaite (1998)	20	AOL members	Hamman (1998, 1999)
8	Virtual work teams	Chidambaram (1996)	21	ACL group	Preece & Ghozati (1998)
9	Blacksburg Electronic Village	Carroll & Rosson (1996)	22	Epinions	
10	Genealogy group		23	Consumerreview	
11	Motley fool	Trabak (2000)	24	H2g2	Schenker (2000a, 2000b)
12	Local elderly group	Zaff & Sloan-Devlin (1998)	25	Vavo.com	Phillips (2000)
13	Deaf group				

Table 2.2 Communities reviewed in terms of attributes

2.3.4 The rating procedure

In order to rate the importance of each attribute to the different communities it was first necessary to build up a detailed picture of each community. Each site was examined in a semi-structured qualitative manner. This involved observing and documenting characteristic features of the communities and examining relevant literature where available. Each community was assessed according to the guide shown in table 2.3.

Community heading	Guide questions
Community background	When was the community started? Who started and runs the community? Is the community sponsored?
Community membership	Age Gender Location
Topic	Main interest(s) of the community Sub topic(s)
Content	Does the community contain face-to-face contact, email messages, public notices, animations etc?
Activity	How often do members meet or interact? Level of activity

Table 2.3 Guide for analysing the communities

Once the communities had been assessed according to the guide it was possible to rate the importance or salience of each attribute to each of the communities. The importance or salience of each attribute to the different communities was rated along a scale of 1 to 5 where 1 equals not important and 5 equals very important. The ratings were based on the community descriptions and observations. A coding scheme was used for the rating procedure to ensure that the assessment of each attribute was the same across the 25 communities. An example of the coding scheme is shown below in table 2.4 (the full coding scheme can be seen in Appendix A).

(9) Guide to member control and rating scheme

1	2	3	4	5
Community members have no control over their own community		Community members have some, limited control		Community members have control over membership issues, topics and activities and can make decisions regarding their community

- Evidence of member roles
- Discussions between members regarding policies and membership issues
- Decision-making between members
- Evidence of resolving disputes

Table 2.4 Example of the coding scheme (member control) used in the rating procedure

Another researcher, working for the sponsors, also rated a sample (15) of the communities according to the coding scheme in Appendix A. The researcher was also provided with the community descriptions described earlier and where appropriate community URLs. There was 89% agreement between the two sets of ratings.

2.3.5 Results

Table 2.5 shows the means and standard deviations of the attributes rating scores. Voluntary membership and member generated content are the two attributes with the highest means (4.52 and 4.12 respectively) and provided content is the attribute with the lowest mean (3.0).

Attribute	Mean	Standard deviation
Voluntary membership	4.52	1
Multiple relations	3.12	1.1
Informal communications	3.48	1.16
Ongoing	3.32	1.49
Opportunity for personal investment	3.16	1.03
Shared history	3.6	1.35
Human feeling	3.16	1.31
Identity	3.2	1.44
Home grown experts	3.7	.84
Member generated content	4.12	.73
Provided content	3.0	1.34
Member control	3.28	1.31

Table 2.5 Means and standard deviations of the attribute ratings

2.3.5.1 Grouping the attributes

All the attributes scored a mean rating of at least 3. Thus even across a diverse range of online and physical communities these attributes appear to be relatively important to communities as a whole. The community attributes were then grouped into two meaningful components. The groupings are shown in table 2.6. The attributes were grouped according to a simple heuristic which fits in with the literature on community attributes as reviewed in section 2.1.1.

- Does the attribute relate to the nature of the relationships within the community? Or
- Does the attribute relate to the logistics of the community?

Those attributes that related to nature of relationships were grouped into component 1 and those that related to the logistics of the community were grouped into component 2 (see table 2.6).

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Component 1	Component 2
Multiple relations	Voluntary membership
Informal communication	Ongoing
Opportunity for personal investment	Member generated content
Shared history/context	Provided content
Human feeling	Member control
Identity	Home grown experts

Table 2.6 Grouping of attributes into components

The two components were named membership and organisation (see table 2.7). The naming of the components reflects the semantic content of the attributes. This reflects the idea that one component consists of attributes associated with relationships and being a member of the community whilst the other is more concerned with the actual organisation of the community in terms of provision of content and length of duration. The literature review of the attributes in section 2.1.1 supports the notion that there is some construct validity to the components "membership" and "organisation."

Component name	Description of component
1: Membership	This component concerns the relationships and interactions between members and the way this leads to the functioning of the community
2: Organisation	The structure of the community in terms of the provision of content, expertise and control

Table 2.7 Name and description of the two components

Figure 2.1 shows the distribution of the 25 communities in terms of their average membership and organisation scores. Most communities were located to the right of the distribution indicating a strong membership component. 15 of the communities were located in the top section of the distribution indicating a strong sense of self-organisation. 10 of the communities were less self-organised and more 'externally' controlled. In the top right of the distribution, (high membership and high self-organisation), there are examples of both online and offline communities, for example, SeniorNet (1) and Christian Union (2).

Component 1 Membership

Membership increases in strength from left to right

Organisation acsends the axis from controlled to self organised
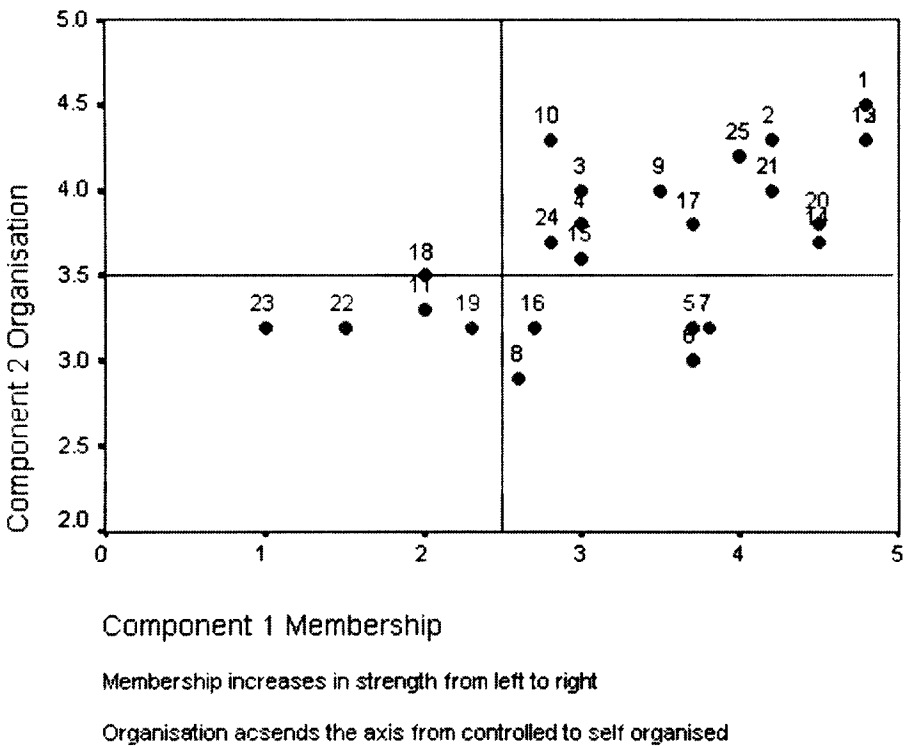
Figure 2.1 Distribution of the 25 communities in terms of membership and organisation

1 = SeniorNet, 2 = Christian Union, 3 = Parentsoup, 4 = R.a.t.s, 5 = Stop smoking group, 6 = University classmates, 7 = Long distance learners, 8 = Virtual work group, 9 = Blacksburg Electronic village, 10 = Genealogy group, 11 = Motley fool, 12 = Elderly group, 13 = Deaf group, 14 Barton neighbourhood group, 15 = Seniorcom, 16 = Phish.net, 17 = Alt. Good morning.net, 18 = iVillage, 19 = eBay, 20 = AOL networks, 21 = ACL group, 22 = epinions, 23 = consumerreview, 24 = h2g2, 25 = vavo.

Figure 2.3 indicates that there are examples of both online and offline communities sharing similar levels of these components and their attributes.

2.4 Integration

In section 1.8.1 the concept of integration within digital communities was introduced. Hampton's (2002a) study was described and it was noted that online communication increases rather than decreases face-to-face communication within neighbourhoods. People can successfully integrate relations that began online to include offline communications as well (Parks & Floyd, 1996; Katz & Aspden, 1997). Other digital technologies are also being developed that allow and encourage the integration of face-to-face and technology mediated interactions. Borovoy et al (1998; 2001), for example, have designed new technologies to encourage and support the development of face-to-face groups. In chapter 1 the study of public perceptions of digital communities also indicated members use a range of media to satisfy their information and communication needs. These 'other' technologies are integrated into the community. Integration involves combining media for communication purposes and integrating media in terms of information gathering. Rather than groups using a single medium as their only form of group interaction, 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.

Integration is therefore the final specific assessment technique to be included within the community. As relationships become stronger within communities so integration between multiple media increases (Haythornthwaite, 2001) with a number of practical and psychological benefits (Etzioni & Etzioni, 1999; Hampton, 2002b; Lazar et al, 1999; Suler, 2000). The way in which the community integrates technological and face-to-face communications will be explored in more detail. This will depend on both the nature of the main technology of interest within the community and the specific context of the community in terms of its member make-up and main activities. In particular, the way in which a technology of interest helps to integrate communications within the community will be examined.

2.5 A framework for characterising community in digital domains

- Membership component
- Organisation component
- Integration
- Social network
- Location

The framework for assessing and characterising community in digital domains consists of five headings shown above. As a framework it provides a basic conceptual structure of community in digital domains. The framework is not hierarchical in nature but is structured so as to provide both broad and specific characterisations of digital community. The headings within the framework are all given equal weighting within the analysis. The framework is valuable in that provides a way of understanding and characterising community in digital domains. Using the framework to guide analysis it should be possible to measure and describe community in digital domains.

The first three headings provide a specific detailed assessment of the community and allow the specific effects of a given technology upon the community to be explored. An analysis at this level makes it possible to analyse how the technology supports the important features of the community. The effects of each of the four CMC technologies (see table 1.1) will be examined. How does email, for example, support the membership and organisation components of the community? Furthermore, how does the technology support media integration within the community?

The social network analysis allows a broader assessment of the community, as does the assessment of the community's location. Both techniques allow the effect of technology to be examined at a broader level. In terms of social networks, how do social network patterns supported by email differ to those supported by text messaging? In terms of

location, does the technology of interest have to provide a new, shared meeting place for the community or can it support the existing location of the community?

2.5.1 Data collection for the framework

As described in chapter 1, triangulation was used to provide a richer, global picture of the communities. Nonnecke & Preece (2000a) note that the combination of in-depth interviews and data logging, for example, is already providing useful research results. In-depth interviews provide rich qualitative data whilst data logging provides a snapshot of community wide activity. Using triangulation allows different levels of questioning to take place from open-ended, exploratory questions to the testing of specific hypotheses.

The two community components provide a useful way of thinking about community and its important features. The headings themselves, however, do not provide measures of community. For the two components, therefore, there is an associated measure. These measures reflect the underlying component and can also be used to describe the original attributes as well. Identity is considered as a measure of community relating to membership and interactivity is considered as a measure of community relating to organisation. These measures are described below in more detail along with a description of integration, social network and location measures.

2.5.1.1 Measuring aspects of the membership component

Measures taken to assess the effect of technology upon the membership component relate to social and personal identity and to a sense of community. Social and personal identity relate to many of the attributes present within the membership component. Social identity represents the social and psychological ties binding the members to the community or organisation (Wiesenfeld et al, 1998). It is thought to be the basic process underlying group phenomena such as social stereotyping, group cohesion, cooperation and empathy (Hogg & McGarty, 1990). Social identity is important in creating a sense of belonging as well as commitment, trust, engagement and future action (Watson, 1997). Personal identity is also important. In order for a sense of human feeling to develop between

members and for the community to bond and share values people have to be able to encompass interpersonal knowledge about their communication partners (Etzioni & Etzioni, 1999). Personal identity is also important in terms of making a personal investment in the community. Identity is socially mediated and much of the mediation is through language (Harré, 1989). Language is important in presenting 'self' although in face-to-face encounters much information about the self is communicated in ways incidental to the 'main business' of the encounter, and some is communicated involuntarily or given off as Goffman (1959) puts it. In digitally mediated interactions, language becomes even more critical in presenting self (Miller, 1995). Social identity can be measured in a number of ways. These include scales, questionnaires and interviews. Social and personal identity can both also be assessed through an analysis of language use. In many online communities the interactions of its members provide an automatic transcript of their language use for analysis.

2.5.1.2 Measuring aspects of the organisation component

Measures taken to assess the effect of technology upon the organisation component include an analysis of information exchanges or message content and measures of the volume, direction and immediacy of messages. In addition, interactivity of the discussions is assessed. Interactivity refers to the way in which a coherent discussion is established through the inter-relatednesss of communications. Fully interactive communication requires that messages take into account not just preceding messages but the manner in which previous messages were also related. In digitally mediated environments, often devoid of visual cues, the way in which messages relate to one another indicates engagement within the community (Bagherian & Thorngate, 2000). Interactivity leads to increased social interactions (Rafaeli, 1988). It may also be important in holding computer-mediated groups together (Rafaeli & Sudweeks, 1997; Quentin Jones, 1997; Smith, 1992). Interactivity measures can illustrate different contributions to the community, member control and engaged and willing discussion. It can be measured and assessed through message analysis. This is considerably easier in computer-mediated communication.

2.5.1.3 Measuring aspects of integration

The extent of media integration within a community can be assessed in a number of ways. Questionnaire and interviews can provide data on integrated communication technologies. Message analysis can provide data on media integration in terms of information resources and cross referencing.

2.5.1.4 Measuring aspects of the social network

Aspects of a community's social network can be assessed through observation, message analysis and through the use of social network questionnaires. These gather information on communication partners, technology use and information exchange.

2.5.1.5 Measuring aspects of location

The location of the community can be assessed through questionnaire data, through message analysis and through interviews. The physical location of members can be examined, as can any virtual or online meeting places or locations.

2.5.2 Summary of data collection techniques

In order to build up a picture of community in digital domains, a number of different communities and different technologies need to be studied. Variations in technologies and communities mean that it is not always possible to use the same data collection techniques in each study. To be able to make appropriate comparisons between the studies data on the same five headings have been gathered for each study. All the studies have collected data on identity, interactivity, integration, social network and location. The nature of the community, the level of access to the participants and the level of access to the community interactions have determined the type of methods used. The nature of the community in terms of it being a relation-based or ego-based network affects the way in which social network data can be collected. The level of access to the participants affects

the level of detail in terms of collecting identity data. The level of access to community interactions affects the collection of data regarding interactivity and integration. In each chapter comparisons between the studies and the findings will be made and highlighted.

2.6 Chapter summary

This chapter has achieved one of the thesis objectives: of devising techniques for characterising and comparing communities in digital domains. Previous techniques have provided too narrow a focus on online communities and have limited descriptive capability. The framework consists of five headings. Two of the headings 'social network' and 'location' were described in detail in chapter 1. These headings allow a broad assessment of the community to be made. Three more specific assessment headings were developed in this chapter. Two of these were developed through a process of selecting and grouping the important attributes of community. The two community components produced were labelled Membership and Organisation. The final specific heading is that of integration, which examines how technologies are integrated into the community's discussions and activities. Measures for each of the headings along with data collection techniques were described. As a framework it provides a basic conceptual structure of community in digital domains. The framework is valuable in that provides a way of understanding and characterising community in digital domains. Using the framework to guide analysis it should be possible to measure and describe community in digital domains. Chapters 3-7 present the experimental work, demonstrating the use of the framework in this analysis process.

Chapter 3

ONLINE COMMUNITIES

This chapter uses the community framework to characterise two different online communities. A review of the emergence of online communities in the business world is followed by a description of the arguments for and against online community. Recent interest in the design of online communities and the importance of their social aspects is reviewed. A three-month analysis of two online fan communities using the framework allows design decisions regarding the implementation of technology to be assessed. The chapter highlights the importance of member adaptation and media integration with respect to the members' sense of community and their social interaction needs.

3 Introduction

In this chapter the framework developed in chapter 2 is used to characterise two digital communities. The two communities are based around the same topic of interest but have been implemented using two different Internet technologies. They are typically thought of as online communities. Online communities are often considered to be groups of people interacting entirely within the confines of the Internet. It has been suggested that online community designers can influence the development of a community through the design decisions they make regarding the technology used and the social interaction policies they implement. Using the framework it should be possible to characterise these two communities, examine the effects of the different technologies and investigate the concept of integrated digital communities. Before describing the study, a brief description of the history of online communities and the increasing emphasis on design may be useful.

3.1 Designing online communities

The first decisions about the design of online communities can be traced back to early e-commerce literature. Werry (1999) provides a lucid account of the representation of online community within Internet based commerce. In early e-commerce texts the notion of culture or community is given little consideration. Building web sites that represented shopping malls or catalogues were thought to be infallible " *If you build it they will come* " (Ellsworth & Ellsworth, 1994). This phrase reveals what little thought had gone into determining who potential users might be and how they would interact with each other. The certainty that 'they' would naturally explore and use online shopping centres was misplaced and the concept was unsuccessful. Some theorists (e.g. Cantor & Siegel, 1994) did pay some attention to the user population. However, they viewed Internet users as a population to be controlled, dominated and planned rather than to be understood and designed for.

In the late nineties designers began to recognise the importance of fostering social interaction and developing successful communities. In current business discourse, online community is seen as being central to the commercial development of the Internet. Hagel & Armstrong (1997) suggest that the key feature of online communities is their ability to capture and accumulate member-generated content. This potential, they argue, can be captured through carefully designed community sites. The Amazon website, (www.amazon.co.uk), for example, allows members to post their own book reviews and the Think Geek website, (www.thinkgeek.com) encourages customers to put up photographs of themselves using the items they have purchased from the site.

Interest in the business potential of online communities has focused attention towards determining the key elements of successful online communities (Hagel & Armstrong, 1997; Cothrel, 2000; Figallo, 1998). More recently there has been a wider focus on the more social notion of online communities (Kim, 2000; Powazek, 2001; Kollock, 1998; Preece, 2000). Increasing access to the Internet at home and at work has meant a proliferation of more socially based online communities. These communities range from broad lifestyle communities such as those targeted at parents or women as a whole

through to very specific medical communities dealing with, for example, damaged knee ligaments (Preece & Ghozati, 1998b). These studies have generated a number of general and specific guidelines for the design of online communities. Preece (2000) in particular has noted that effective design involves combining the technological and social side of the design. Designers can influence the development of a community through the design decisions they make. In business conceptions of online community the role of design is more apparent. Issues of security, privacy and copyright are naturally associated with business ventures. Designing secure software applications and strict registration policies do not seem out of place when thinking about making payments online. In more social conceptions of online community these design decisions appear sterile and unnecessary especially when considering Rheingold's (1993) description of online communities:

[Places where we] *"...fall in love, find friends and lose them, play games, flirt, create a little high art and a lot of idle talk. People in virtual communities do just about everything people do in real life, but we leave our bodies behind." (p3)*

But all online communities are designed to some extent. Decisions about how people are going to read and post messages, what software the community can afford to purchase and maintain, the technical know-how of the developers all impact on the way the community looks, functions and importantly its overall character. But how far do design decisions go in forming and maintaining the character of the community and the way in which its members interact? Any discussion of online community needs to recognize that community is a process and not an entity (Fernback, 1997). As such the purpose and needs of the community can and often do change. Developers may only be able to influence an online community in its infancy (Preece, 2000). As Schwier (2002) puts it *"Communities are built or dismantled by those in the communities, not by the people organising or managing them."*

3.1.1 Designing for social interaction

In contrast to face-to-face communications, Computer Mediated Communication (CMC) has historically been characterised as a 'lean' medium (Daft & Lengel, 1986). More recent research, however, has indicated that social relationships can and do thrive online (Baym, 1998). Although still considered by some to be outside the realm of 'real' community, studies of online environments have found that people can create community and sustain strong ties through electronic media (Rheingold, 1993). In online environments devoid of visual cues, communication is the key to social identity formation and maintenance (Wiesenfeld et al, 1998). Despite the anonymity that an online environment offers, many people have found ways to develop and present an outward 'face' (Goffman, 1959) and to build communities. There are numerous examples of the ways in which software designed to support online communities has been adapted to the social interaction needs of the user. Strongly tied pairs, highly motivated to communicate manage to modify or adapt the 'lean' CMC environment to support their social interactions. People use emoticons or smileys to convey emotions using plain text. The smiley 'faces', for example :-) or :-(have to be read sideways. People also use abbreviations as well as developing and adhering to CMC-specific rules of conduct (Baym, 1998; Patterson, 1996). The use of CMC is adapted to the needs of the community and the interacting members. CMC *"never are technologies whose design is fixed; instead the design continues to be developed simultaneously with their implementation and use."* (Lea et al, 1999, p.300).

3.1.2 Online community guidelines

Whilst Graphical User Interface (GUI) design is a well-researched area producing numerous and extensive guidelines (see Preece et al, 1994), there is as yet no comprehensive set of guidelines for the design of online communities. Online communities are set up every day and many of those falter and fold. There have been numerous attempts at defining a set of steps that must be taken to build a successful

online group, for example Palloff & Pratt (1999) state that the group must have a clearly defined purpose and must have a distinctive gathering place. The group must also allow for a range of member roles and allow members to resolve their own disputes. Going beyond these general guidelines, some researchers have highlighted the importance of specific design decisions regarding online communities. Preece (2000) suggests that designer decisions affect the character and to some extent the success of online communities. Malhotra et al (1997) have also noted that the introduction of different design features led to changes in the size and usage of their online community. Preece argues for a balance between the technological and the social aspects of online community design. She has produced a number of guidelines pertaining to what she calls usability and sociability.

Usability is a well-established concept in Human-Computer Interaction (HCI) (Preece et al, 1994; Nielsen & Mack, 1994). It is concerned with designing computer systems to support rapid learning and low error rates. Such systems are highly productive pleasant and easy to use. In terms of online communities, usability impacts upon members' ability to communicate with each other, locate information and navigate through the system. Usability focuses upon the human-computer interaction and sociability refers to the social interaction between group members. **Sociability** issues relate to the purpose, people and policies of the community. The purpose of the community will have an effect on the nature of the interactions and the use of the technology. Is the purpose of the community to engage in discussion, to find information or to offer support? Social, chatting based communities will be better supported by technology that enables synchronous chat. Message boards in which messages are posted to and read from a central board, may be better suited to communities concerned with exchanging information and ideas. Designers need to think about the future members of the community. How old will they be? What level of technical skill will they have? Have they got any special needs? Finally the policies of the community are perhaps the most visible aspect of sociability decisions. Policies regarding membership and registration, security and privacy, free speech and moderation are all important.

Assessing the purpose and the needs of the community will help focus upon the usability issues and the sociability issues that need to be supported. Decisions about who is taking part, why they are taking part and how they should take part all affect usability issues concerning the design of the online community. The purpose of the community for example will affect the type of software used for communication. Message boards, for example, are useful where information exchange is the main purpose of the online community. Policy decisions regarding membership affect the design of registration forms and login scripts.

3.2 The current study

In order to study the effect of the digital technology and its intertwined usability and sociability effects, 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. Table 3.1 is a section from table 1.1 presented in chapter 1. It illustrates the features of the technology studied in this chapter.

Type	Sync	Async	Ad-hoc	Organised	One-to-one	One-to-many	Mobile	Fixed	CMC technology
3		•	•			•		•	Message board,
3		•	•			•		•	Email mailing list

Table 3.1 Classification features of the technologies studied in this chapter

The two online communities exhibit many similar, generic characteristics. Both fall under the same space-time classification (Ellis et al, 1991). 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. In addition to their generic similarities, the two online communities also exhibit a number of specific differences in terms of their usability and sociability features. These differences and a brief history of each community are outlined below and summarised in table 3.2.

3.2.1 Site A: Email list

The email list was started by an interested individual to whom members send registration requests. Once registered the user's name is automatically added to the group list. When a user sends an email to the group every member of the list receives the email. Members can reply to the group list or directly to the sender by replying to the individual's email addresses, which appears in the header of the message. The email list is supplemented by web links to some additional features. These features include a calendar, a photo board and a document area. In addition members can also initiate ballots and quizzes. When any of the additional features are used, an email alert is sent to the list with a link to the relevant page.

3.2.2 Site B: Message board

The message board was started by a commercial company and members register on the website and are assigned a username. Once on the board members can post new messages or read through the existing messages. Messages are threaded and the archive can be searched. To post a reply, a member clicks on a reply button and an authoring template appears. The user can decide whether to included the original message in the reply and whether or not to add a signature. The reply is then posted back to the board. It is not possible to send a message to a specific individual only. There are seven prescribed message board topics. Five deal with the books; one with the film and one is a general

message board representing the schoolhouses. Each message board is subdivided into more specific topic areas. This community contains thousands of registered members.

Design Features	Site A (Email list)	Site B (Message board)
1 Usability Issues		
Type of software	Email List	Message Board
Posting messages	Send a message to group list email address	Post form automatically addressed to message board
Replying to messages	Reply function on email application	Reply form automatically addressed to message board
Threading	Optional feature of email client	Yes
Search facilities	No	Yes
Ability to set preferences	No	Yes (preferences for viewing messages, ignoring certain authors, time zones etc)
Additional features	Web storage area for photos, documents, database tables Facilities for voting and quizzes	Access to film trailer
2 Sociability Issues		
Purpose	To discuss Harry Potter	To discuss Harry Potter
People	Fans, mostly young people	Fans, mostly young people
Policies		
Membership	Send email to group manager	Register email address against a screen name and password
Security	Email client security to access messages Login with username and password to use additional features	Login with username and password to read or post messages
Privacy	Individual email addresses used. Anonymity at discretion of members	No individual email addresses used. Known as username on the board. No personal information, age etc allowed.
Moderation	No	Yes (moderation of other website addresses and personal information e.g. age)

Table 3.2 Usability and sociability features of the two sites

3.2.3 Aims and objectives of the study

The aim of the study is to assess differences in the communities' interactions based on their usability and sociability features. The character and type of both communities will

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be assessed and a number of predictions based upon the design guidelines will be examined, specifically that:

1) The technology used will affect the type of messages that are sent. Email lists should include more information and announcement i.e. broadcast messages.
2) Threading should aid the flow of messages and lead to more interactive discussions.
3) Messages should relate to the specific topic headings under which they are posted.
4) Moderation should affect the amount of personal information that is disclosed.

3.2.4 Methodology

The study was run as a quasi-experiment (Preece, 2000). The two communities have similar purposes but use different software and contain different sociability policies. It should, therefore, be possible to examine the impact of the usability and sociability differences on the nature of the two communities. Due to the nature of communities it was not possible to control all variables and so the results must be examined carefully with respect to cause and effect.

3.2.4.1 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, the Trailer board and the Gryffindor board. Samples were taken from the beginning and the end of the study period. In total 415 posts were collected, 200 from the Trailer board and 215 from the Gryffindor board. 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. Posting figures for Site A were simply summed on a daily basis and membership numbers were recorded from the registration website. All the messages on Site B were numbered sequentially. It was therefore possible to calculate daily posting figures by subtracting the highest message number on day x from the highest message number on day x +1. Membership data for Site B was not available. An electronically distributed questionnaire was used to gather demographic data and personal statements about the nature of the communities. The questionnaires are shown in Appendix B. Some of the questionnaires were followed up with email-based interviews, the themes of which are also shown in Appendix B. For privacy reasons all names have been changed and any identifying information has been removed. Any messages that are quoted are for the purpose of illustrating a specific phenomenon and are used with the posters' consent.

3.3 Results

The analysis of the collected messages, the questionnaires and the observations is divided into 2 sections. The first examines the nature of the two different communities in terms of the objectives and predictions presented in 3.2.3. In the second, the results are discussed in terms of their implications for the five headings of the community framework. Technological support for the community's activities is examined before the wider implications of the results are described in the discussion section.

3.3.1 Overview of messages

The two communities differed in terms of the size of their membership base and their daily posting figures. Site A received an average of 11 messages a day. Whilst Site B varied from 144 messages a day on the Trailer board to, 622 on the Book 5 board, to 1566 on the most popular 'Gryffindor' board.

As described in section 3.2.2, Site B is subdivided into a number of specific topic boards. In the 'trailer board', for example, members are encouraged to discuss the film trailer. An analysis of the messages under each topic heading revealed considerable overlap between topics and members frequently discussed topics in the 'wrong' boards. The trailer board contained trailer messages plus six other kinds of messages including those relating to plot speculation and merchandise. Of the six other topics, four were also found in the 'Gryffindor board'. The Gryffindor board also contained many non-topic heading messages. The messages on Site B did not always relate to the specific topic headings under which they were posted. Compared with Site A, the boards in Site B, the Trailer board and the Gryffindor board, contained a smaller number of topics (12 versus, 7 and 5 respectively).

As a starting point for examining the study predictions, a content analysis was performed on the collected messages. Unlike the categorisation schemes in chapter 2 which were used to assess aspects of the whole community, the categorisation scheme used here relates only to the collected messages. To analyse the content of Site A's messages the 316 collected posts were examined. A content analysis was performed and a taxonomy of five types of content was developed: introduction, opinion, information i.e. question/answer, announcement and other – a catch-all category. The categorisation schemes were not mutually exclusive and some messages contained elements of, for example, information and opinion. To simplify the categorisation process, each message was examined holistically. This approach involves reading each message through and then classifying the message into one category only in terms of the overall or prominent tone of the message. This approach was also taken by Preece & Ghozati (1998b) in their content analysis of online health community messages. Two colleagues also classified all the messages according to the same criteria. This produced a high inter-researcher reliability of over 93%. Messages that were not immediately classifiable were put to one side. The classification of these messages was then resolved through discussion between the different raters. The content types are explained in more detail below and the results are shown in table 3.3.

Introduction: The overall tone of the message involves an introduction by the member to the group.

Opinion: Concerns expressing personal opinion or speculation.

Announcement: The message is concerned with making an announcement to the group.

Information: Message is concerned with asking for or providing information.

Other: A catch-all category including technical problems.

Content Category	Number of posts	Percentage of total messages
Introduction	28	9%
Opinion	79	25%
Announcement	54	17%
Information	133	42%
Other	22	7%

Table 3.3 Content analysis of Site A

All 415 messages from Site B were examined. The messages were taken from the two message boards and were sampled from the first and last week of the study period. A taxonomy of seven types of content was developed. Five of the content categories are the same as those developed for Site A and represent the same type of content. The three new content types not present in Site A are explained below. The same two colleagues classified all 415 messages according to the taxonomy. This produced a high inter-researcher reliability of over 95%. A comparison of tables 3.3 and 3.4 reveals that Site A contains more information type messages than Site B.

Reaction: Expression of emotion.

Personal narrative: The message conveys personal information.

Presence: The message announces presence or impending absence on the board.

Content Category	Number of posts	Percentage of total messages		
		Overall	Trailer Board	Gryffindor board
Opinion	158	38%	68%	10%
Information	99	24%	26%	22%
Introduction	11	3%	0%	5%
Reaction	10	2%	3%	2%
Personal narrative	98	22%	2%	42%
Presence	32	8%	1%	14%
Other	7	3%	0%	5%

Table 3.4 Content analysis of Site B (Trailer and Gryffindor boards)

3.3.2 Interactivity

Interactivity is assessed in a number of ways. These include an assessment of the number of single, reactive and interactive messages. Table 3.5 shows that Site A and B contained similar percentages of single messages. Site A contained more reactive messages and Site B, which included automatic threading, contained far more interactive messages.

Message type	Site A	Site B
Single	20%	21%
Reactive	72%	51%
Interactive	8%	28%

Table 3.5 Interactivity data for Sites A and B

The results for the integration and identity sections presented below draw upon 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. The questionnaire allowed cultural and demographic differences between the two communities to be identified.

There were differences in the age and the location of members. Two thirds of the respondents from Site A were from the UK. Three-quarters of the respondents from Site

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B were from the US. The respondents ranged in age from under 18 to 65. In Site A the median age of the respondents was 17 and in Site B the median age was 18. There was a heavy gender bias in both groups. Three quarters of the message board posters and two thirds of the email list were female. This does not match the general finding that 35% of UK Internet users and 39% of US Internet users are female (Matthews, 2000; GVU, 1998). The relatively young age of the members may be important in this respect. The GVU's 9th WWW user survey found that younger Internet users were likely to be female. Strong gender biases have been found in other online communities, in particular specialist newsgroups (Patterson, 1996; Baym, 1998). The detailed results of the questionnaires can be found in Appendix B.

3.3.3 Integration data

A number of types of integration were examined. Integration between different types of information source was examined. Table 3.6 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.

	Source of information						Personal information	Contact details
	Email	Radio	TV	Web	Book or paper	% of total messages		
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 3.6 The number of messages containing a reference to a source of information, personal details or contact information

Integration between different communication channels was also examined. The messages in Site A contained far more personal information i.e. age, name, location then 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. Finally the 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.

3.3.4 Identity

	Site A	Site B
Number of respondents reporting that online group was a community	14/15	15/17
Number of respondents reporting feeling like a member of community	12/15	14/17

Table 3.7 Self-report data for community membership

Table 3.7 indicates that the majority of members of both Sites A and B considered that their online group was a community and that they themselves felt like members of that community. Those that did not feel like a member of the community reported that they were new to the Site and had not had time to develop feelings of community membership.

3.4 Community framework analysis

The results are now discussed in terms of the five headings of the community framework.

3.4.1 Membership component

The results show that most respondents from both Sites felt like members of their respective communities. The follow up interviews reinforce the sense of belonging. The time spent with the community and the size of the community appear to be important

factors. The small size of Site A also made it possible for members to feel like they knew each other, for example, people noticed if another member had been absent from the list for a while and asked after them. 'Knowing people' was also important in Site B. In this Site a strong sense of human feeling existed between some members and was characterised by in-depth conversations concerning members' personal lives.

Within Site A there was a sense of being part of a group of like-minded people. Members posted messages for the benefit and interest of everyone else and members viewed the email list as a way of providing community based discussion. As such, conversations are open to all and group participation is encouraged. Most members interacted with one another and many members maintained multiplex relations with each other. Posters see themselves as members of the community and the messages are for the benefit and interest of 'us' the group. Site A displays a lot of 'us' style communication. These group messages allow everyone to become involved and for a shared history of the community to be built. Language use also supported the feeling of social identity. Members used inclusive terms such as " Hi everyone" when addressing the community.

Site B also contains some 'us' style communication. In message boards containing discussions about future plot lines, speculations and ideas are laid before the group as a whole for analysis. Many of the other message boards e.g. Gryffindor Board contained more one-to-one messages. Individuals use the boards to hold one-to-one discussions often about off-topic matters. One way in which people achieve one-to-one discussions is to post a message with the intended discussant as the subject heading e.g. *Subject: DavidR.*

On Site B the reply template automatically posts the reply back to the group and there is no provided facility for posting an individual reply. It is common, however, for people to post their contact details, usually in the form of an email addresses and encourage members to correspond directly with them and to miss the board out altogether. Discussions on both Sites tend to be informal. Whilst the majority relate to Harry Potter,

off-topic messages about topical information or pertaining to location provide additional links between members and strengthen relationships.

Discussions frequently make reference to details within the books. A sense of shared identity is enhanced by the use of specific codes and abbreviations. Members of both sites appear to be well acquainted with standard 'Netiquette', (Lehnert, 1998), abbreviations such as LOL (laughing out loud) and PPL (people). Specific abbreviations were also used e.g. JKR (J.K. Rowling) or HP (Harry Potter). Members of Site A even designed a range of emoticons or smileys specific to Harry Potter, for example: <I~8-) This smiley, when read sideways, indicates Harry's wizard hat, his trademark scar and his glasses.

Personal identity was a prominent feature of Site A. Members registered using their email address and signed messages using their real names. The use of email addresses sometimes led to confusion regarding the identity of the poster. This forced posters to make their personal identities very explicit.

> **"Hi, I'm not Ann that's my mum, our email system always sends out messages under my mum's name, I'm Helen"**

Introduction messages were another way in which Site A members developed their personal identities and became recognised members of the community. Most people introduced themselves with their first post. This seems to be an established norm although there is no explicit encouragement to do so. Despite the moderation restrictions in place, members of Site B still found ways to express personal identity. Usernames, for example, often related to aspects of the Harry Potter books, for example, BarryPotter and Quidditchking. These convey a sense of personal identity as well as showing affiliation with the group. Personal signatures attached to the end of each message were also common.

3.4.2 Organisation component

The results showed that Site B contained more fully interactive messages than Site A. Fully interactive communication requires that later messages in any sequence take into account not just preceding messages but the manner in which previous messages were also related. Design factors affecting the interactivity of a discussion include threading, the reply function and the use of quoting. On Site B the explicit threading aids members in creating interactive discussions. Threading on Site A is an optional feature of the members' email clients. The threading on this site does not aid interactive discussions because of differences in how members make use of the reply function within the email client. The reply function is sometimes used instead of sending a new message to the group. A newcomer may post a message to the group for the first time by replying to the most recent message. The result is a message whose content does not relate to the subject heading and thus threading, which is based on subject headings, is rendered useless. This leads to confused and disjointed communication. In Site A, usability issues are determined by the email client used to send and read messages. As such there is no standard way of replying to a message. Different email clients use different ways of quoting messages, which can make following discussions on Site A difficult. The reply template in Site B assists in the creation of conversational coherence by asking the poster whether or not they wish to include the previous message. The message can be edited for length and is then automatically included in the new message with angle brackets to indicate a different speaker, for example, **David wrote >**

The questionnaire results indicated that many members found the discussions difficult to follow. This related to the problems with quoting and in the case of Site B with the number of messages and the size of the community.

A reactive or interactive email or message board discussion indicates that members are interested in responding to one another. The nature of the interactive discussions varied. Discussions often related to external activity such as the publication of new books,

merchandise and the release of the first film. Whilst both sites were predominantly built upon member generated content they differed in terms of the provision of structures to shape that content. Site B split the message board into a series of progressively more specific topic headings. Each heading related to a different aspect of Harry Potter. This did not, however, encourage members to stick to the prescribed topics and there was considerable overlap between the boards.

The message analysis shown in tables 3.3 and 3.4 indicates differences between the two Sites. Most messages in Site A were questions and answers and email lists are well suited to this type of interaction. Many of the information messages were repetitions. This is common in communities with no searchable archive. The size of the community and the number of daily postings make it possible to answer individual requests for information. The content types in Site B differed from those in Site A. Introductions are less common in Site B. This may relate to moderation but may also be due to the size of the community. Newcomers to Site B may feel that any introductory message would simply go unnoticed considering the number of daily posts. Opinion messages are the largest overall form of exchange within Site B. Members exchanged opinions on the books, the characters and the film. The high percentage of personal narrative and presence messages on some of the boards (see table 3.4) suggests the development of personal relationships and indicates that not all discussion is centred on the topic of Harry Potter.

During the course of the study the effects of moderation were both observed and personally experienced. Messages posted to Site B that did not adhere to the guidelines were quickly removed from the message board. The questionnaire posted to Site B was also deemed by the moderators to be in breach of the guidelines and was removed without warning or explanation. It was possible, however, to collect some responses prior to the removal of the questionnaire and subsequent questionnaires were distributed via these initial respondents.

Interactive discussions are sometimes restricted by the presence of moderation, which can also influence the amount of member control within the community. The moderation on

Site B reduces the amount of member control. Site B is moderated to ensure that members adhere to the board's guidelines with respect to the protection of younger posters' identities. In addition to the reduced personal information disclosure, the effect of moderation can also be seen in posts containing cross-references to other sites. As members of Site B are not allowed to post messages containing sponsored website links or addresses, they often paste the relevant information directly into the body of the message. In Site B, in particular, members demonstrate in-depth, and often expert knowledge when presenting personal opinions or plot analyses.

> **"I've been thinking about where Hogwarts might be? We know that the school is in Scotland from the "Acromantula" entry in "Fantastic Beasts and Where to Find Them." The Hogwarts express leaves from Kings Cross and takes all day. Book 1 describes the forests, mountains, and rugged countryside, I would guess that the school is in the Grampian Mountains."**

3.4.3 Integration

The results show that members of both Sites A and B integrate a number of media and information sources into their community discussions. Including references to other media and information sources extends the range and interest of the community as well as providing a source of verification. Members of both sites have integrated their online community involvement into the rest of their lives (see figure 3.1). 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.
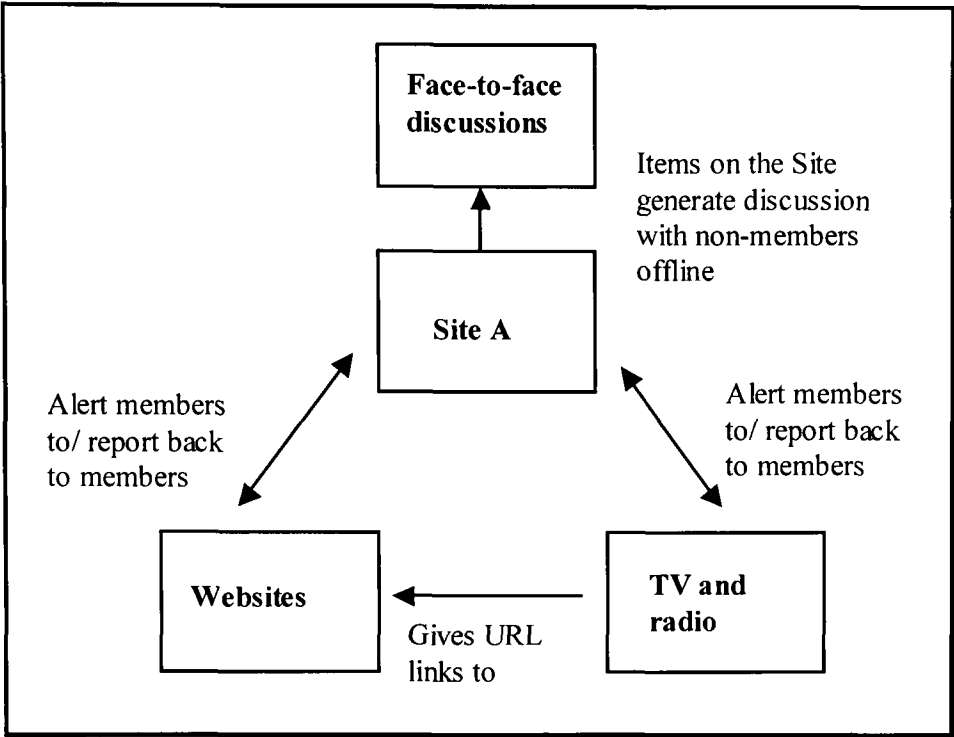
Figure 3.1 Integration of media in Site A (Email list) community

Members of both sites have found additional ways of communicating with each other. These include, private email, instant messaging, IRC and face-to-face. Offline relations help to support online relations as well. Figure 3.2 shows the integration of communication media surrounding Site B. 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.
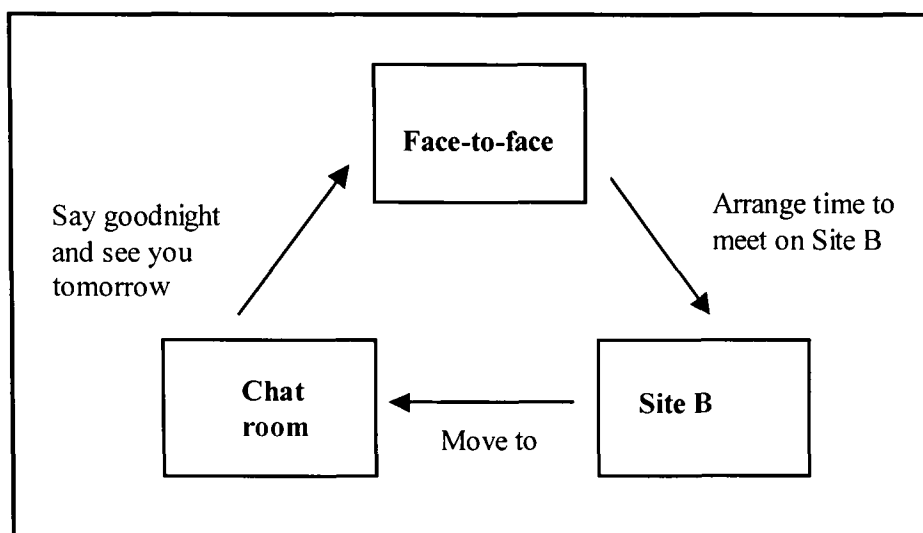
Figure 3.2 Integration of media in Site B (Message board) community

The two sites differed in terms of the exclusivity of their media genre use. Site A members, for example, specifically objected to members using genres characteristic of other media. They wanted to maintain the nature of interactions specific to an email list. Members of Site B, however, had started to use their message board technology to express other software genres most noticeably IRC.

In IRC the style of interaction is very different from that which message boards are designed to support. Chat is a form of synchronous interaction. It supports fast moving conversation with an emphasis on greetings. The predominant style of interaction on the most popular message board on Site B appears to resemble chat and is not typical of message boards. The high level of personal narrative messages and presence messages also supports the idea that members used the message board as if it was a chat room. The concept of presence messages is similar to the notion of CB radio codes in which broadcasters alert each other if they are in service (10-7) or are out of service i.e. about to go off air (10-8) (Davis, 2001). Presence announcements indicate who is currently available to chat and are similar to automatic messages indicating the number of users currently logged on to a chat system.

Chat style interaction takes on many of the conventions associated with IRC. It is common practice, for example, to verbalise physical cues e.g. 'hehehe' for laughter. Another recognised convention is to represent physical actions or reactions by presenting them between two asterisks (Reid, 1991). This can be one line in a chat conversation or form part of an extended role-play.

door opens
1ˢᵗ year girl steps into room
this is Moo from gryffindor here to tell you my favourite part of book 1!
waves wand
smiles and speaks thus

3.4.4 Social network

The pattern of interconnections within the communities differed between the two sites and between the two boards on Site B. Site A was far more interconnected and most members interacted with one another. There were also a number of central members who exchanged a wide variety of content types and maintained multiplex relationships with all members. Site B revealed different social network patterns. Some of the message boards showed little community wide interconnection yet strong pair relationships. Other boards were characterised by heavy use of the base group i.e. messages directed to the whole group rather than targeted at a specific individual.

In all the diagrams, the notation follows that described in section 1.9.1 3. The numbers represent individual members and the connecting lines indicate communication direction. All the diagrams are based on 50 consecutive messages collected from the communities and the whole group refers to messages directed to the whole group rather than targeted at a specific individual.
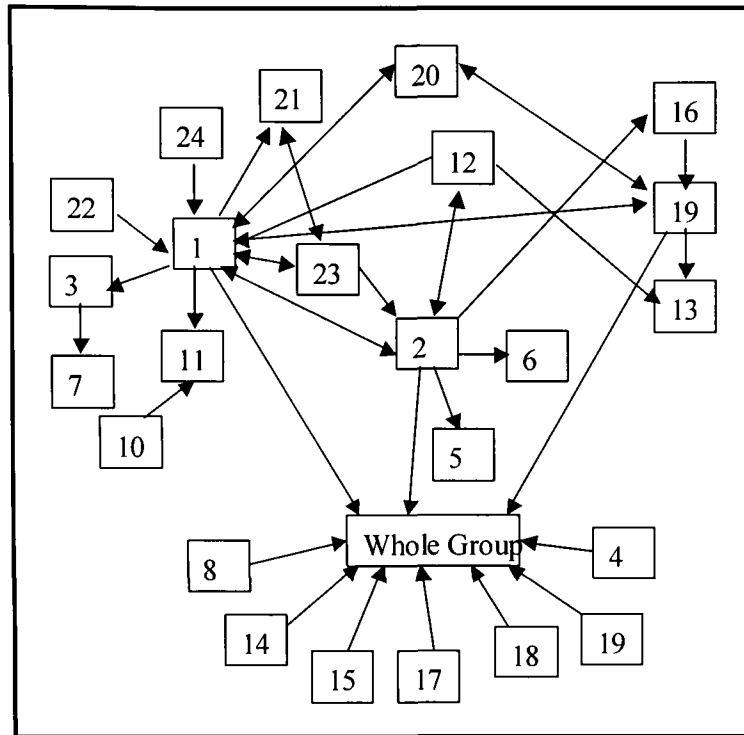
Figure 3.3 Social network diagram indicating relations between members on Site A

Figure 3.3 is by far the most interconnected diagram. Most members interact with one another. There are only a few solitary messages sent to the base group and these tend to be introductions i.e. a person's first message to the community. There are a number of central members in this community. Members 1 and 2 both send and receive messages. These members exchange all types of content especially opinion and information, they also take on the role of welcoming new members to the community. Central members also send messages such as announcements to the base group. Figure 3.4 shows that the members of the Gryffindor board on Site B are not very interconnected. The social network diagram is dominated by a single connection between two individuals (members 1 and 3). Of the 50 messages analysed 23 are exchanged between these two members alone. The social network diagram for the trailer board of Site B (figure 3.5) shows even fewer interactions between members.

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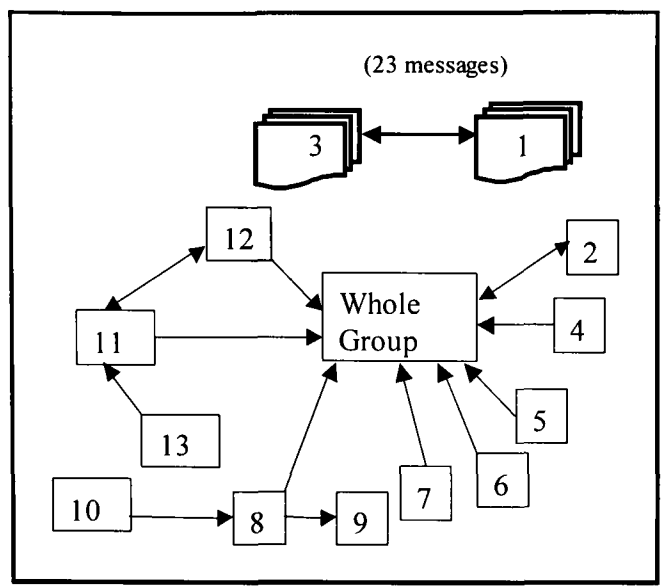
Figure 3.4 Social network diagram indicating relations between members on Gryffindor Board

Figure 3.5 contains far more individual members than figures 3.3 and 3.4, yet is still very unconnected. There is neither community wide connection as in the email list (figure 3.3) nor strong pair relationships as in the Gryffindor board. The base group features more prominently in this diagram than in the other two. Most messages are not exchanged between members but are single messages directed at the base group. There is little reciprocity and only pockets of member- to-member exchange exist.
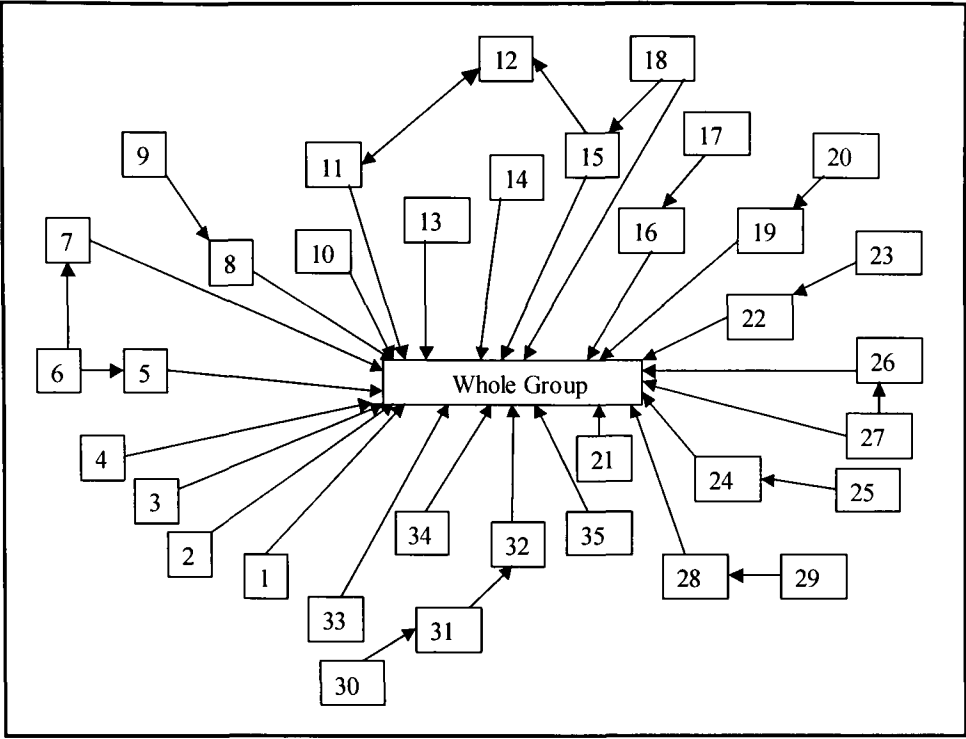
Figure 3.5 Social network diagram indicating relations between members on Trailer Board

3.4.5 Location

Site B had a shared online meeting place. This provides members with a location for the community. This socially produced space provides a meeting place and a location for the transcript of the community's interactions and history. The boards in Site B were referred to as 'real places'. Members, for example, signed off with 'see you tomorrow in Gryffindor'. The limitations of both Sites have led to the extension of the communities' locations. Site A provides a location for the transcript or message history of the group. It incorporates links to other websites and refers to radio broadcasts, newspaper articles and television programs. This serves as a way of enriching the email only communication and as a way of extending the space of the community. The location of the Site B community is often extended to include other chat rooms. Both communities have spread across the online-offline divide into physical meetings places and have found other mediated methods of communication.

3.4.6 Summary of the two communities in terms of the framework

Membership component

Site A was characterised by group wide communication and a strong sense of community. The development of personal identities allowed members to make a personal investment in the community.

Site B was characterised by more one-to-one communication and a series of strong friendships.

Organisation component

Site A was characterised by reactive discussions. Member generated content was self controlled and moderated.

Site B was characterised by ongoing interactive discussions. The members made more use of homegrown expertise and had less member control.

Integration

Site A members had integrated the HP community into their physical lives and vice versa. They also integrated external sources of information into the community.

Site B members were limited in terms of their media integration onsite. They used and integrated a variety of communications media away from the HP website itself.

Social network

Site A consists of an interconnected group of members with a central group of posters. The Site B trailer board was characterised by the heavy use of messages directed to the whole group rather than targeted at a specific individual. The Gryffindor social network pattern showed little community wide interconnection yet strong pair relationships.

Location

Site B had a shared online meeting place. Members of Site B extended this location through the use of other media for personal communication. Site A provides a location for the transcript or message history of the group. Members of this Site have extended the location through reference to external sources of information such as other websites.

3.5 Community activities

Figure 3.6 shows that the members of the two Harry Potter fan communities engage in a number of activities including discussing ideas, making friends and socialising. The activities are based on Preece's (2000) activities (see 1.6.2.2) and have been expanded on the basis of the results of this study. The technologies support these activities by allowing time to compose and edit messages and by providing access to many like-minded people. The technologies enhance these activities by providing search and threading facilities, calendars to record important dates and a simple way of linking to other media.

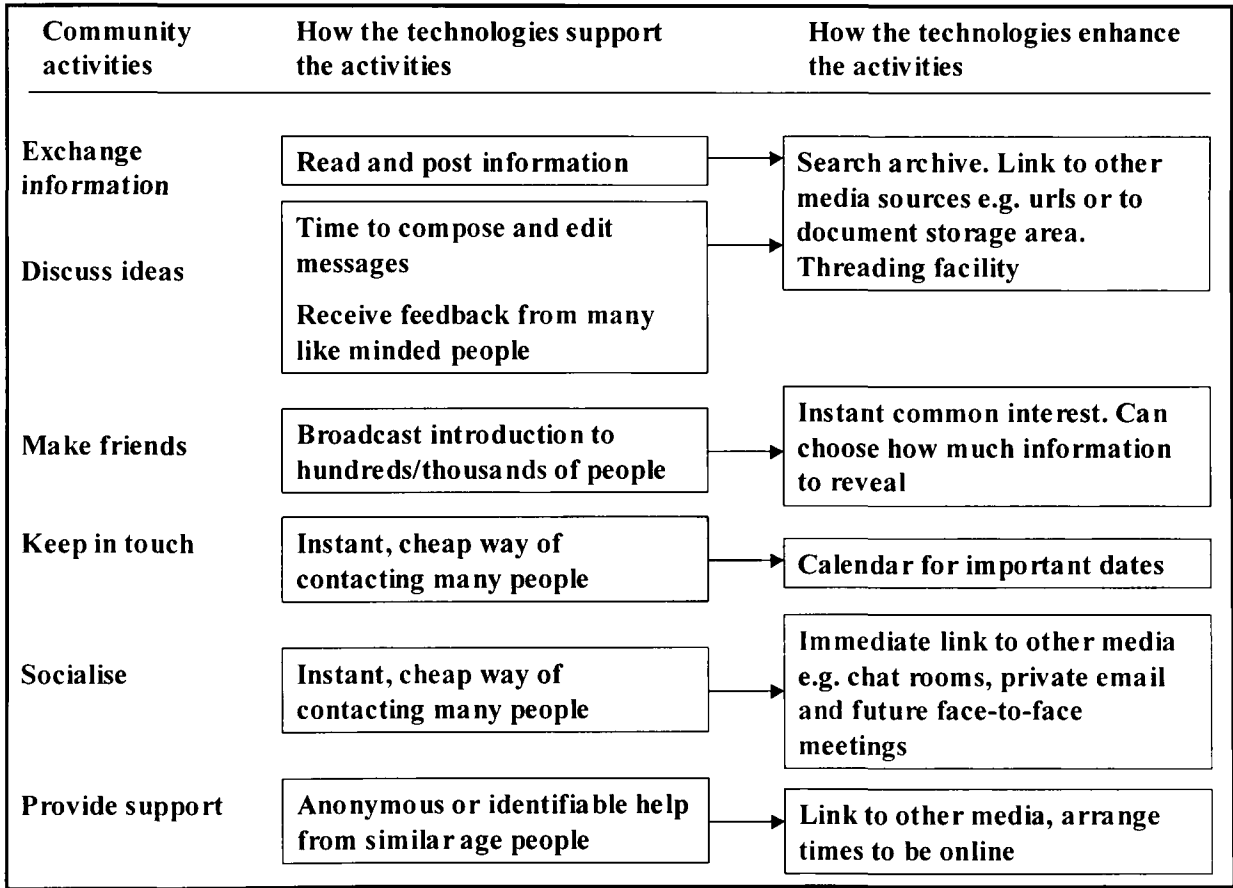| Community activities	How the technologies support the activities	How the technologies enhance the activities
Exchange information Discuss ideas	Read and post information Time to compose and edit messages Receive feedback from many like minded people	Search archive. Link to other media sources e.g. urls or to document storage area. Threading facility
Make friends	Broadcast introduction to hundreds/thousands of people	Instant common interest. Can choose how much information to reveal
Keep in touch	Instant, cheap way of contacting many people	Calendar for important dates
Socialise	Instant, cheap way of contacting many people	Immediate link to other media e.g. chat rooms, private email and future face-to-face meetings
Provide support	Anonymous or identifiable help from similar age people	Link to other media, arrange times to be online

Figure 3.6 The community activities supported and enhanced by the technologies

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3.6 Summary of main findings

- The technology affects the type of message content, Site A contained more information messages

- Messages in Site B did not always relate to the specific topic headings under which they were posted

- The interface threading facility in Site B aided the development of interactive discussions

- The presence of moderation on Site B did limit personal information disclosure although members discovered other ways of expressing identity

- Respondents from both Sites reported a strong sense of community and of a sense of belonging

- Members of both communities had integrated other technologies into their interactions. These included other communication media and other information sources

- Members of Site B had adapted the media to suit their needs by using the message board as a chat room

3.7 Discussion

Despite being based on a common interest, the two Harry Potter fan communities examined in this study exhibit differences in terms of their overall nature and their members' interactions. These differences are based to some extent on the different design features of the two communities. Usability design differences, such as threading, affected the flow of interactions within the two communities. Sociability design differences such as moderation policy did limit personal information disclosure on the website but increased the amount of messages containing personal contact details. In addition to usability and sociability factors, the demographic and cultural make up of the communities also differ. The US bias in Site B has financial implications for the length of

time members can afford to stay online. People often stay on the message boards for several hours at a time. The larger number of messages ensures that new material is present and this makes 'chatting' on the boards a lot easier. The size discrepancies between the two communities also play a role in the differences observed. The larger the membership the more one-to-one communication develops. It becomes difficult for all members to participate actively in the discussions that maintain the shared values of the community (Etzioni & Etzioni, 1999).

3.7.1 Type of community

Both the underlying technologies supported the development of Harry Potter fan communities. The email questionnaires and interviews revealed a strong sense of community within both groups. The community framework headings have provided a way of assessing the type of community present in both Sites A and B. In terms of the membership component of the two communities, the messages sent to both Sites A and B showed a strong sense of social identity and of shared human feeling. Site A encouraged individual identities as well whilst the members of Site B devised ways in which individual identity could be expressed without the explicit revelation of personal information. The organisation component of the community revealed differences between the communities in terms of member control and the development of reputation. Site A members moderated their own community whilst Site B, prevented from cross-referencing to other websites had to demonstrate in-depth knowledge and expertise in presenting new information to the community. In terms of integration, both sets of community members had integrated different sources of information and different methods of communication into their interactions. Members of Site B had adapted their message board technology and were using it as if it was a chat room.

The communities are characterised by very different social network patterns. In Site A most members are interconnected and the network reveals a number of important central members that maintain ties with most of the community. The network pattern for the Gryffindor board indicates less group wide communication and more involved one-to-one

friendships. The trailer board network is the least connected with most messages being directed through the base group. Site B has a distinct online location where members can meet. Site A provides a location for the transcript or message history of the group. The fact that the members have extended their relations beyond the online environment has meant that the location of the communities has also been extended.

Overall the two technologies encouraged two different types of community. The email list supports a more information-based community, with broadcast messages being sent out to a relatively small group of members. The lack of external control and design promotes self-management and control in addition to social and personal identity. The size of the community makes it possible for group wide communications often involving central members. The message board supports a more conversational style community through the posting and reading of threaded messages. Whilst many strong personal relationships have developed in both communities the size and moderation differences have affected the styles of the two communities. Site B feels more like a group of people waiting in a cinema queue. They are all waiting to see the same film but some people become restless and wander off to buy ice creams. The queue provides a good meeting place and some people make very good friendships but the queue is a long one and those at the back cannot hear those at the front. Site A, however, is more like a convention. A group of people with a common interest have all gathered together to listen to one another and to make announcements. The members take it in turns to propose new resolutions and are free to agree and disagree with the different speakers.

3.7.2 Assessing the usefulness of the usability and sociability guidelines

This study has presented a different view of digital community. Both communities have highlighted limitations with the concept of a simple online community. Members of both Sites A and B made 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 community. Many community members had bridged the divide between offline and

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online worlds. Members involved offline friends with online events and vice versa. Furthermore several members also interacted face-to-face thus expanding the location of the communities. An implication of this 'different view' is that the tendency to design websites to support 'digital community' might fail to adequately address the roles and uses of these other technologies in the development, management and growth of the community. Given this implication the usefulness of the design guidelines regarding usability and sociability are reviewed below in terms of community integration and adaptation.

3.7.2.1 Integration and adaptation

The design guidelines regarding the usability and sociability of the two underlying systems did predict some of the differences between the two communities in terms of their overall nature and their members' interactions. Guidelines relating to usability, did on the whole lead to the intended effect. The effect of the more restrictive sociability guidelines was more complex. Trying to control or manage social interactions is a more difficult task than the sociability guidelines would suggest. Some sociability guidelines take a limited view of the consequences of their implementation. This study has shown that social interaction is key within these communities. The driving force behind using the technology for these members was a desire for social interaction and community. 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.

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. The influence of the designers was more acutely felt within Site B and led to a number of member adaptations. These included subverting the message board genre into one of chat. 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. Where moderation policies, for example, on Site B limited relationship development on the site itself, some friendships moved off site instead. Members provided each other with alternative, private contact details or arranged to simultaneously transfer their conversations to a chat room. The different technological implementations of the two communities did lead to differences in terms of their overall natures. Site A with its simpler email system allows members to be more flexible in terms of their social interactions with one another. It allows the expression of a strong sense of both social and personal identities and allows for a more integrated digital community.

3.7.3 Implications for design

- Designing topics for online discussion are only necessary at the start of the community's life. Over time open-ended topics suggested by members become more popular

- The questionnaire and email interview data indicated some difficulty in terms of being able to follow the discussions. In addition to threading and reply templates, email clients should consider automatic templates for new messages that include the group's email address e.g. by providing a link at the end of the email message

- Both communities tried to incorporate information from other sources into their discussions. This was limited to some extent by moderation. Websites need to facilitate open-ended discussion on associated topics e.g. similar books and films and consider multiple communication methods between members e.g. chat and message board

3.7.4 Implications for community

- The size of the community affects the type of social network relations that develop between members

- Restrictive policy decisions can speed up the process of adaptation by community members

- Internet based communities still require access to other technologies to support their communication and information needs

3.8 Chapter summary

In this chapter the community framework has been used to assess the effects of two Internet technologies upon the nature of two online fan communities. The five headings of the framework presented in 3.4.6 have allowed a characterisation and comparison of the two communities studied. It has allowed the existing design decisions to be related directly to the community headings. The framework distinguished between the two types of community. Through an examination of the headings it was possible to identify where design decisions made by the community developers, for example, in terms of moderation had an effect on the nature of the community, in this case in terms of organisation.

Integration emerged as an important theme during this study. Members of both fan communities had integrated a range of different media into their online communities and had also integrated the online communities into their day-to-day physical lives. Online communities do not exist in isolation from other media or from the physical world. Indeed, both these communities were in fact integrated digital communities. Furthermore, members of both communities had to some extent adapted the technology to suit their own needs as the communities developed. In the next chapter the notion of integration is explored in more detail. The community framework is used to analyse the development of a new community as it uses text messaging as a way of extending its web-based interaction.