

THE GROWING IMPORTANCE OF E-COMMUNITIES ON THE WEB¹

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ABSTRACT

As the web is changing, e-communities are gaining more and more importance. The formation and maintenance of e-communities is supported by various technologies like wikis, discussion forums and Internet games which we briefly describe in this paper. Some of these technologies are not completely new and have been well known for a long time. We believe that in combination with new technologies and methodologies it makes sense to take a look on how e-communities are used now and will be in the near future. This paper describes an overview which software pieces, methodologies and techno-social behaviours are responsible for the growing importance of the further development of e-communities.

KEYWORDS

wiki, blog, Internet games, file sharing, discussion forums, answer brokering, Web 2.0.

1. INTRODUCTION

The Web is more and more a technological basis for the information and knowledge society. It is not only driven by new services, technologies, methodologies and content-rich digital media, but by an increasing amount of interactivity. The early Web user who consumed information, placed some orders, and participated in a chat or discussion here and there is more and more replaced by an active participant creating new and intertwined content on the Web, or is working in close collaboration with others for productive tasks or for just the pleasure of doing so. Vehicles for such activities are e.g. wikis, blogs, file sharing systems, discussion forums, answer brokering and Internet games. Nowadays the easy usage of a variety of new software tools is sometimes referred to as Web 2.0 (O'Reilly 2005), a term we consider a bit unfortunate, since there have been earlier uses of the term Web 2, e.g. a VRML based Web called 2nd Web (2nd Web Symposium 1998) or a second generation Web systems (Maurer 1996). A feature of O'Reilly Web 2.0 is that organisations offer simple technical services like blogs, wikis etc. and users – the community – easily fill them with content without knowing anything about HTML, Java etc. In Web 2.0 users are more than information consumers, they are also authors: publishing information is as easy as retrieving information. This opens the Web for a whole new group of users and applications.

The necessary technologies have spread rapidly in the last years and can now be found almost everywhere on the Web. The impact they have on the way our society works is tremendous. E-communities have existed since the beginning of the internet, but their real role and potential has just been discovered and is bound to further increase in the course of time.

In the second chapter of this paper we will describe features, advantages and possible problems of these interesting emerging services, technologies and media. Since many of these technologies are not really new but parts of them have also been around or proposed in the past, our third chapter will offer a brief overview on earlier ideas and systems and what happened to them.

In the last chapter we also describe how these services, technologies and media could be combined in order to achieve even better results and therefore offer more collaborative possibilities for e-communities. We

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propose a system which combines the advantages of wikis, blogs, discussion forums, file sharing, answer brokering and possibly even Internet games in order to create a system which supports the formation and maintenance of e-communities.

2. COMBINATION OF WEB 2.0 SERVICES LIKE WIKIS, BLOGS, FILESHARING, DISCUSSION FORUMS, INTERNET GAMES AND ANSWER BROKERING

In this chapter we will give a brief overview of each of the technologies mentioned above.

2.1 Wiki

Wiki or "Wiki Wiki" meaning "quick" in Hawaiian is about 10 years old. It was created by a software designer from Portland, Ward Cunningham, who wanted to have a simple database system which would enable him to easily exchange design patterns (Portland Pattern Repository) with his international colleagues. (Möller 2005) He describes wiki as 'the simplest online database that could possibly work' (Wiki 2005). Indeed a wiki is software which enables every user to easily change the content of a page by clicking on an "Edit Page" Button. The content can be changed directly in the browser using a special wiki-Syntax which is even easier than HTML. A speciality of the wiki-Syntax is a schema called "CamelCase" which describes links to other wiki pages. Such links consist of one or more words containing at least two capital letters. As soon as users write such a construct a wiki page can be created by clicking on this construct (link). The fact that creating a page demands that the name of a new page is mentioned as a link on another wiki page makes sure that there are cross links between pages in wiki. (Möller 2005) Besides open editing, the other important feature of wikis is sophisticated version control which enables users to see recent changes and the history of the changes of a Web page. This is often an important instrument for assuring the quality of content in a wiki as in the case of (malignant) manipulation of the content the old version of wiki page can easily be reconstructed by the use of version control.

2.1.1 Wikipedia

The most famous practical example of wikis is Wikipedia 'the free encyclopedia that anyone can edit' (Wikipedia 2005). However Wikipedia does not implement all Wiki features: for example the 'CamelCase' is not used in Wikipedia. Wikipedia was founded by Jimmy Wales in 2001 as a work platform for his encyclopaedia project "Nupedia", which turned into the prototype of Wikipedia. It can be found in various languages, with the biggest Wikipedia edition in English.

The main requirements of an encyclopaedia are that information is presented in an objective, well-balanced and up-to-date systematic way. To give a specific example, contributions on artists of similar standing have to be similar in structure and volume. At this point the problem of content quality of Wikipedia is equal to the more general problem of the validity of information on the Web. Is the Web an immense collection of information garbage, disinformation, conspiracy-theories and individual information exhibitionism without any differentiation needs between reality and fiction/fantasy? The Wikipedia turns out to be a valuable knowledge tool, better than what ordinary search results on special topics would deliver. The Web community trusts Wikipedia more than other Web resources. The question is if this high trust is justified from the point of information validity. There are indications that completely uncontrolled contributions are not acceptable, a fact already discovered in the late 80's in the open discussion forum E.R.D.E (Lechner and Maurer 2003) on Austrian videotext! This became evident to users of the Wikipedia when in November 2005 John Seigenthaler published his story in his column in USA Today (Seigenthaler 2005) (see also Kleinz 2005). In his article Seigenthaler explained how he found false data and accusations in his biography in Wikipedia. His case started an extensive discussion about the reliability of Wikipedia content. The problem is that many other Web sites, like (Answers.com 2005), publish data from Wikipedia which makes it even harder to correct false information. It is not hard to imagine the impact false data about a person on the Web could have on one's life, in fact it can lead to as (Seigenthaler 2005) puts it: 'Internet character assassination'. It can also be very hard for a person to find proofs to rectify such false information once it has been published.

The case of Seigenthaler has shown that there is a need for some kind of authentication in Wikipedia. Wikipedia creators and volunteers realized this and they are currently working on a solution for this problem.

2.2 Blog

Blogs is the shortened term for Weblog which describes a Web page on which an individual or a group frequently generate text, upload photographs, video or audio files and links. An important advantage over a normal Web page is that a blog is even easier to create and maintain using common free software like (Blogger 2005) or Austrian (Twoday 2005) enabling users to create their own blogs within seconds and without any technical knowledge. Most blogs use RSS-feeds (really simple syndication feeds) for user subscribing.

Blogs are very popular. There are approximately 50 million blogs worldwide (Siebert and Fischer 2005) and in some world countries like Croatia (Blog HR 2005) blogs have more readers than daily newspapers. Since 2003 there are even annual Weblog awards (Weblog Awards 2005) with many interesting categories for blogs.

There are different types of blogs: Some of them with most impact on the e-community scene are personal blogs, collaborative blogs, blogs about news and politics and topical blogs. However the most interesting type of blog for this paper is the collaborative blog. In a collaborative blog the blog posts are written by more than one person. These blogs can be open to everyone or limited to a group. (Blog 2005) As you can see a collaborative blog is very similar to a wiki. However there is one big difference: a blog is "additive". I.e. there is no content edited or deleted from a blog. A user can just add text (or pictures, files etc.) to a blog post but it is not possible to edit or delete content once a blog has been published. A famous collaborative blog is (Slashdotcom 2005).

Personal blogs often act as an online diary containing very personal opinions and facts. These blogs have become amazingly popular over the last five years. However they have to be treated with caution, especially concerning privacy that bloggers can expect. Of course it is obvious that almost all bloggers desire attention and want people to read their blog posts. But although we all subscribe to the principle of free thoughts and speech, bloggers should be cautious when writing about politically controversial topics, or information that might be interpreted as innuendos. A year ago a young Croatian called Vibor Kalodjera, who worked at the U.S. embassy, was suspended from his job because he was suspected of writing a blog in which he ridiculed his job, the U.S. president and foreign officials. He did his blog posts anonymously but signed it with "Vibbi". (CBS News 2005) Another similar recent case happened to a school student who was reprimanded because he criticized his teachers in his blog. (Blog HR 2005) Such stories should serve as a reminder that we must not misinterpret the Web as a private diary unless the information is secured in some fashion.

However, there are also various advantages of blogs. The first one concerns private blogs: in some cases like for a person having cancer or suffering from anorexia or just having a bad period in life, it can be comforting and empowering to read about others having the same experience. Also there is the possibility to exchange experiences in form of recipes, advice, music, videos etc.

An important advantage of a (collaborative) blog is the speed of such a medium. If there are some interesting news they can be written within minutes. Such blogs can be also updated very fast and in case of a collaborative blog from very many persons in order to offer the most recent news. Of course one should consider that in this case the correctness of the news could be reciprocally proportional to the speed of the news.

One interesting example is a Korean citizen reporter portal with over 30.000 users and almost 2 millions readers daily. (Oh my news 2005) In this portal every user can write about regional happenings or specialized articles. In order to publish, users must first register and then they can publish articles for the portal. International editors read through stories, decide which articles are going to get online and polish them for readers.

The blog scene is developing fast and the newest trends among blogs are video blogs or vlogs. (Siebert and Fischer 2005)

2.3 Discussion forums on the Web

A discussion forum is a popular tool for theme-based communication on the Web which is methodologically similar to the first client-based newsgroups which have been used in the beginning of the Internet age. Nowadays discussion forums are more and more implemented as browser-based and clientless newsgroups.

Discussion forums come in many flavours and can be un-moderated or moderated. The second alternative is usually more successful. (Maurer et al. 1999) In a way it is surprising that discussion forums that often offer good structure are not preferred over blogs!

2.4 File sharing

In the last years file sharing has become very popular. The exchange of music, photos, movies or even applications is the new hobby of many. File sharing as such has a long tradition. At first there was the Internet Relay Chat (IRC) which was mainly used for text based communication, e.g. exchanging news from Gulf War 1991. (IRC 05) Nowadays IRC acts as an important file sharing system where large amounts of music, movies and applications are exchanged all over the world. However the problem with IRC is its usability. IRC is a text based application without good search facilities. In order to find something users have to first become member of an e-community and make friends willing to share their files. This can be very time consuming and exhausting and requires users to have good skills in computers. Napster, the well known music sharing program had better usability than IRC. It was the first with a nice graphical interface, making music sharing simple and hence very popular. But both, Napster and IRC were using centralized file servers. So stopping the trade could be easily done by shutting down the fileserver. After Napster was shut down due to IPR problems, peer to peer technology emerged. It allows everyone on the net to be both - server and client at the same time. The more data a user gives to others the more he gets from users. Today a new OpenSource peer to peer network has taken the leadership: BitTorrent. BitTorrent is software which was originally written to enable users to transfer big files (greater 100 MB) without using http or ftp. If one downloads a file from another user this file is split up into segments and everyone wanting this file shares their downloaded part with others. So the traffic can be better distributed and the file is faster on the downloader's hard drive. (Hottes 2004) Sharing of photos is also very common. Yahoo recently started flickr, an online photo management and sharing application. Photos can be easily shared with friends and stored on the internet. (Flickr 05) also offers the possibility for users to blog their photos. Following flickr many other similar services that are incredibly easy to use and are free have come available, e.g. (Magix 2006).

2.5 Answer Brokering

Answer brokering systems help users to find a solution to a given problem. Users first choose a domain of their problem and then ask a specific question. Depending on the system users can ask the community or declared domain experts.

Google Answers is a service from Google offering answer brokering. In Google Answers, users choose a problem domain, ask their question and determine how much they are willing to pay for an answer to their question. Domain experts who read the question can post an appropriate answer along with references and other resources. These experts are paid for each satisfactory answer. Registered users have the possibility to submit answers but they will not get paid. (Google Answers 2005)

Active documents use this idea: users can ask arbitrary questions to documents and answers are provided immediately and apparently from the document itself. According to (Kolbitsch and Maurer 2005b) and (Heinrich and Maurer 2000) there is an "online" and an "offline" component for such documents. The "online"-component provides the answer without human intervention. It provides a similar answer which has been asked (and answered) before. Otherwise the "offline"-component is invoked: the system answers something like "This is a really good question. Let me check with our expert and you will have the answer in a few days." Then the question is sent to an expert who answers it and stores the answer in the database. An advantage is that after some time, typically after some 500 to 1000 users per document, answers are available for most significant and most frequently asked questions.

2.6 Internet Games

Internet Games have been existing since the very beginning of the Internet and include all sorts of computer games which involve playing online with other users. To succeed in playing the games e-communities are created to share knowledge among users. Although all current popular gaming consoles like Microsoft XBOX 360, Sony PSP, Sony Playstation 2 and Nintendo DS support an Internet interface, the market for

collaborative Internet games is currently low. However it is expected that the market will grow in the next years. (Heise News 2006). A few examples will have to suffice:

Bongfish Interactive Entertainment was founded by two students from Graz University of Technology in 1996 (Bongfish 2005). They have implemented a snowboard action PC game which is now in beta phase. One interesting feature of the game is: the players can choose on which route (in Alaska) they want to ride. They can practice riding this route under various weather and light conditions and then compete with other members in the e-community! (Stoked Rider 2006) Another similar ski game where users can compete in the community is (Ski Challenge 2005).

A game called OGame has gained large popularity in 2005. OGame is a strategic space simulation PC game with players competing with each other simultaneously. An important advantage is that a standard Web browser is sufficient for playing the game. A player can choose one universe and make a planet with resources. The goal of the game is to build an empire with lots of resources, make alliances with other players, attack other alliances and players and destroy their planets. The e-community is very important for this game, for example OGame offers a management for alliances which enables forming an own alliance or search for already existent ones. There is a ranking of players which makes the game even more appealing. OGame requires its players to be virtually always online in order not to miss an opportunity in the game and can therefore provoke some problems in every day's life. It is also interesting that this game is offered as a free game and it is completely financed by in-game advertising. (OGame 2005)

Since its launch in 2000 the Internet PC game (Habbo Hotel 2006) has opened the world of e-communities to children. "Habbo Hotel has already attracted users to create 37 million Habbo characters to the game and the number of unique monthly users is already over 4.3 million." (Sulake 2006) Habbo Hotel is a computer 3d graphics animated chat room platform as a virtual hotel where users move around chatting, build their own characters and rooms, make friends, exchange furniture and buy Habbo coins in an e-shop to be able to decorate their rooms, buy gifts for friends or play additional games. The game was designed for teens between 8 and 18.

2.7 Other interesting services/tools/technologies for e-communities

There are new promising services, tools and technologies emerging almost every day. One of these are geographical information systems, e.g. (Google Earth 2005) which is a piece of software that enables users to search for places all over the planet, search for services in these places (e.g. pizza delivery) and add tags to these places. (NASA World Wind 2006) is an open software geographical system which offers similar features like Google Earth but in a more scientific manner. One interesting feature of NASA World Wind is the possibility to see the moon as well as the earth. Recently also Microsoft has released a beta version of a geographical system called Windows Live Local (see Live Local 2006). It offers similar services like the two already mentioned geographical systems but it can be used from an ordinary browser and it has other interesting features like e.g. possibility for creating driving directions and printing them out. Furthermore it offers the possibility to locate users on the map by using Location Finder from Microsoft or IP-address.

Podcasting is another emerging service. The word (Podcasting 2005) comes from iPod and casting and stands for producing and publishing audio files in form of a Weblog (blog) with a special RSS-feed. As there are more and more videos there are also podcasts with videos called videocasts or vcasts. The audio or video files are called episodes and can be heard or seen on the computer or an iPod. Podcasting can be used for various purposes e.g. e-learning, diary, radio etc. (see also Odeo 2005)

There are other interesting services for e-communities like online bookmark management (del.icio.us 2005). Everything posted to del.icio.us can be seen by other users which enables building of a great teamwork bookmark collection. (Yahoo 2005) offers a similar service in a beta version.

As we have shown in this chapter the development of Web is going towards more and more actively involving the users, by content production, diverse activities, communication, building and maintaining of strong e-communities. However we may ask ourselves whether the tools and technologies described in this chapter are really new. This is discussed in the next chapter.

3. REVIEW OF SOME EARLY SYSTEMS

In the second chapter we have discussed many interesting technologies. However research shows that most of these are not really new. In fact many of the ideas behind the technologies have been present for quite a long time but were not accepted by large user communities. In this chapter we want to discuss some of the past developments and ideas in this direction.

3.1 Xanadu

Although never implemented in its entirety, Xanadu (Nelson 1965) (Gillies and Cailliau 2002) as proposed by the visionary Ted Nelson was not just a forerunner of all Web-like efforts, but was already expected to deeply involve the user, not as reader, but as someone who would assemble material from existing sources via the ingenious and still rarely implemented transclusion idea (see Kolbitsch and Maurer 2005a) and combining it with own content. Actively incorporating links was another feature of Xanadu. Since information could never be deleted it can be said to have had already the most perfect version control conceivable. We all have to bow to the genius of Ted Nelson who was some 30 years ahead of his time.

3.2 Early Hypermedia Systems

It has been noted that many of the earlier Hypermedia Systems did contain features that go well beyond what is even now available on the Web, including much user involvement. The famous Hyperties system of Ben Shneiderman is one such system, but maybe the grandest of all was the Intermedia system developed by Andy van Dam and others at Brown University: its functionality even from today's vantage point is stupefying. However, after years in good use (locally) it shut down simply because it was based on an obsolete hardware/software platform and nobody had enough courage to try to port it! Those are just two of the many hypermedia systems, many with features that go much beyond what we have today on the Web, but did not make it big. Early surveys such as (Conklin 1987) show how much has actually been lost by the wave of victory of the rather simple minded Web, that is only slowly catching up.

Before 1980 (!) Viewadata, later called Videotex (VTX, and BTX in German) was already started in Europe as first large scale public distributed systems. They were the predecessor of the Austrian BTX system starting in 1985 (Gillies and Cailliau 2002). By using proprietary hardware called MUPID which has been sold some 40.000 times (Bruck and Mulrenin 1995), MUPID-BTX had already "teleprograms" (akin to Java applets) and a number of e-Community features.

3.3 Early collaborative gaming and discussion systems

The craze of the (in)famous "Dungeon and Dragons" games that were played on the now almost forgotten PDP 11 in just about any research establishment world-wide gave early indication of the popularity of networked games. Collaborative games like "Discovering the Planet AC" in Austrian BTX showed already the power of large-scale networks for gaming, yet somehow things did not take off in a big way, except for some local success. From 1988 until 1995 a public discussion forum existed on the Austrian videotext system BTX called E.R.D.E (Elektronische Rede und Diskussions Ecke) (Lechner and Maurer 2003) where users could discuss any topic in e-communities.

3.4 Hyperwave

Hyperwave is an internet information system originally called Hyper-G. Hyper-G was conceived and implemented in the early nineties by Frank Kappe and Hermann Maurer at the Institute for Information Systems and Computer Media at the Graz University of Technology and was officially released in July 1994. Its concepts reach far beyond the usual WWW. Among other advantages, Hyper-G offers more structure than WWW (for example by having persistent help for orientation and navigation) and a more powerful linkage model. There is an object oriented database where all documents and links (link is an individual object) are stored. Furthermore links are bidirectional, meaning that they can be followed back and forward, and in Hy-

per-G links can show from and to any type of documents. The later feature allowed links in all kind of documents – even pictures, video and 3D-objects. This technology also enabled making annotations or blogs in these documents: for example users could annotate a video. (Dalitz and Heyer 1995) (Maurer 1996) (Dalitz and Heyer 1996). Hyperwave (Company 2006) is still in major use in Intranets: with its many collaborative features, its version control, its built-in annotation and discussion features, its provisions for consistent file sharing, etc. it can do all that systems mentioned earlier can do, with one significant handicap: the interfaces (due to high functionality) are not as clean and easy to use as in today's dedicated systems. We can notice here an aspect that is typical: the simple often beats the more complicated one: programming in schools would have never taken off without a stupid programming language such as BASIC, laughed at by the developers of Pascal, Algol 68, etc.

3.5 Computer Supported Cooperative Work (CSCW)

Many of the present ideas for enabling e-communities have already been designed in the past (Uni Hannover 2006) as the part of Computer Supported Cooperative Work. The idea of CSCW was to build a work platform for groups which could overcome geographic and time barriers. The term groupware is often used in this context: groupware is a notion for practical implementation of CSCW-theory as software or hardware.

A CSCW system consists of four base models: multi user editor, news systems, conference systems and coordination systems. Let us take the multi user editor as an example. This is an editor which enables many users to jointly edit documents in a collective environment. This kind of editors can be compared to today's wiki systems. It is interesting, however, how attitudes are changing over time. In the past it was not at all imaginable that somebody would change the text another user had written in such a collaborative document. This would rather be taken as an insult. But today this is even desirable: it is one of the most important characteristic of wikis. The importance of CSCW can be best judged by the plethora of conferences that have been held on this particular subject.

4. WHAT SHOULD A MODERN E-COMMUNITY OFFER?

Physical and virtual communities (e-communities) depend on communication. Classical communication among humans without any technology is mainly (a) face-to-face or one-to-one (e.g. in a dialogue), sometimes (b) one-to-many (e.g. speakers to their audience, a priest to his community, advertisement) and rarely (c) many-to-many (e.g. sellers and buyers at a marketplace). The speech flow from many-to-one (e.g. many buyers at an auction to one seller) is less dominant in classical communication than in the digital age. With the technological inventions of the Morse telegraph, telephone, radio, television, fax, mobile telephone, and a variety of text based and multimedia internet communication systems the disparities between (a), (b), (c) and (d) have changed. Communication has been enriched by digital tools, which enable users to communicate with these communication models in a more balanced way. In the digital age phones (e.g. mobile phones, internet phones), emails and instant messengers are the main tools for (a) one-to-one communication (e-communication). Portal web servers, file sharing, Web radio, Web-TV, blog and e-shops are typical tools for (b) one-to-many. Mailing lists, newsgroups, discussion forums, IRC, e-marketplaces, Internet game sites and wikis are used for (c) many-to-many communication. If many people communicate to one person in order to get information, knowledge, services, products or entertainment, they use the (d) many-to-one form of communication, e.g. in Ebay and dating/matching sites. The many-to-one communication flow has also a severe data protection impact. With hidden wiretapping systems, spyware and employee observation software, conversations, emails and Web transactions can be easily transmitted from numerous unsuspecting users to one single point of analysis, e.g. for criminal action. E-communities can use multiple combinations of communication flow models, but they should be aware of the fact, that it is relatively easy for communication tool providers, network administrators and hackers to read, copy or manipulate unscrambled contents. Especially the instant messengers are a new target for hackers (Leavitt 2005) to integrate viruses, worms and malicious codes. Therefore e-communities – even within a closed virtual private network (VPN) - should encrypt their content before sending, such as Skype encrypts 'voice over IP', file transfer, and instant messenger with AES 256-bit end-to-end encryption.

Assuming that all social software tools for e-communities are secure, the question is how we should use them without taking the risk of a Babylonian confusion of tongues, where the explosive development of digital tools – with the consequence that everybody uses a different tool and methodology – leads to the destruction of all communication. Two key concepts are a well known solution to this question: standardization and market leadership. Thus we should learn how to communicate with proper tools.

Most of all e-community home sites are centred around portal servers. Since the late 1990s these portal servers have been simple content aggregating engines with features like member mailing lists, schedulers, project management tools, document management, archives, file sharing, organization charts, discussion forums and link lists. Portal servers and enterprise information technology core systems have been completely different. But in the last few years the portal servers have adopted application integration and then – most recently – the automation of business core processes. One major business core process of an e-community is communication itself. Communication is mobile and user-centric, therefore the best tool for communication is the personal digital assistant (PDA) – also known as a Pocket PC Phone Edition or Smartphone, which is a mobile phone on a sub-sub-notebook with all sorts of fast internet tools. The new home of the e-community is the fully customized PDA, which works as a client or mirror of a powerful e-community server system. The features of such a next generation PDA are: mobile phone, full feature browser, fast Internet through WLAN and UMTS, VPN, huge memory cards/sticks, high resolution camera with flash-light (for scanner functions), media player, social software tools like instant messenger, I/O for external devices, GPS integration, touch screen display and slide-out keyboard. At the moment the Blackberry client/server 4.0 technology and the Microsoft Mobile 5/Exchange 2003 SP2 are close to this PDA specification. One of the most important new features is push technology, which means that the user of a PDA does not have to retrieve his/her emails, calendar, tasks, contacts or other data by starting a synchronizing program - the data replication finds its client automatically and updates the client over-the-air close to real time. Therefore the user is always online and standby such as working in an office desktop environment. Another basic requirement for this PDA technology is to protect data against usage by unauthorized people, e.g. in the case of loosing the PDA.

Assuming that such a PDA in combination with a server infrastructure is available: what are valuable applications and features for e-communities? Most people are members in communities. Exceptions are people who deny communication like anchorites or are not able to communicate like patients with complete paralysis or locked-in syndrome. But the majority of people are members of several communities and e-communities. Today the contact manager feature in the organizers like Outlook, Groupwise and Lotus do not manage e-community features. The contact manager does not propose to automatically store new contacts from instant messaging sessions, discussion groups and chats. But this would be an advantage, if persons could go back to a contact they had e.g. during a messenger session without searching in several social software tools. E-community management is an item which should be integrated into organizers. The main tasks are: organization of e-communities (“my e-communities”, where someone is a member and “other e-communities”, which is a link list), listing of the members contacted before by specific communication channels (phone, email, messenger, newsgroup, etc.), storage of the contacts in the contact folder/database. Another important application feature is how to work with documents within an e-community. Hyperwave IS 6.3 and Microsoft SharePoint Portal Server 2003 are good examples of providing access to information and documents for e-communities. The Microsoft SharePoint Portal Server 2003 uses the concept of Web Parts. These are pre-defined components which can be easily configured by non programmers by simply dragging and dropping to assemble a view of complementary information from multiple sources. For example, one Web Part might display a user's appointment calendar from Outlook; another might show a list of e-community members, each of which functions as a link to an instant messenger service. The SharePoint Portal Server 2003 is designed to be a self-service portal and therefore new features can be easily added. As a server for an e-community it has features for alerts and audience targeting. Alerts notify someone when any relevant file, Web site, person, or application has been added or changed. Audience targeting enables individuals or groups to push relevant information and applications to an e-community. Search and indexing can easily implemented over the whole portal. PDAs as the new e-community engines have transactional access to portals, on the one hand to retrieve information and on the other hand to upload content and change the architecture of the portal according to the user's roles and rights. For a glimpse of what future PDA's might look like and what they can do see (Maurer et al 2003).

A self-service portal in combination with instant messaging services is an interesting combination for accelerating the e-community development process. Messaging services like ICQ, Psi (Jabber), MSN Messenger, Yahoo Messenger, Google Talk, AIM (AOL Instant Messenger), Skype and QQ have been used mostly

without collaboration on portals. These tools are used in situations, where problems have to be solved by teams using time sharing by communicating in parallel with some members of an expert team e-community. The reason to use the instant messenger in a special situation instead of a phone and email is that the communication with the team is faster and electronically documented. With an instant messenger, team members on the "buddy-list" are "online-marked" and therefore seen as being available/standby. Now someone who is working on a problem can easily communicate with more than one member, ask questions and "pick up" the solutions from the different instant messenger windows and copy & paste it into the own document. The phone has the disadvantage that the caller knows only after the call, if the callee would have been ready for collaboration before the call. A caller has also the communication control which is sometimes too invasive into team collaboration, e.g. some people do not stop talking while phoning. The email-collaboration is sometimes too slow and complicated with using attachments. Also the communication flow of "replying to all" results in some cases in too much information where the overview can easily be lost as to who has inserted which piece of information into an email or into an attachment. The disadvantage of the instant messenger is that the information archive is not automatically integrated into the email/organizer/desktop-search systems. The search: "Which messages did I get from Hermann Maurer the last 2 days?" should list a result like this: "5 emails, 3 SMS, 2 phone calls, 1 fax, 3 instant messages and 1 video conference". With the paradigm of a unified messaging system (UMS) one step has been already done: the integration of email, fax, SMS and voice mail, e.g. to send a SMS by email or receive a voice mail by email. Instant messaging and video conferencing (e.g. by using UMTS video phones) are the next integration tasks.

5. CONCLUSION

In this paper we have written about the growing importance of e-communities on the Web. We discussed various new technologies like wikis, blogs, file sharing etc. The development and the offer of various services, tools and new medias/technologies are enormous. This is the reason why our paper cannot provide more than a first glance at some of the more important developments. All technologies described in this paper enable building and maintaining different kinds of e-communities, like work communities, entrepreneur communities, friends, neighbourhood communities, research communities, developer communities etc. We want to emphasize that the boundaries between these technologies are vague. To re-emphasise this point let us look once more at wikis. A wiki where editing of already existent pages is permitted by for some reason deleting this content is prohibited can also be referred to as a (collaborative) blog. The same principle can be applied to blogs. A blog to which a person can directly respond and start a new topic, can also be seen as a sort of a discussion forum. Discussion forums exchanging various types of files can be seen as a file sharing area and so on!

Up to now wikis, blogs, file sharing, discussion forms and answer brokering have been using independent technologies. However, our research has shown that a system combining all of these technologies would be a very powerful system for development of e-communities regardless of their purpose. We intend to come back to this in further papers.

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