1 The Wiki Concept

1.1 What is a Wiki?

Imagine you are surfing the Internet, and you stop at a site where you could and would like to add or modify something. For instance, you have a literary reference or link to add. Or you've noticed a typing error. Perhaps you even have a lengthy article that you'd like to display on a separate page. So, you just click on the "edit" button, change everything you wish, add a couple of ideas, confirm it, and the new page is online immediately! In a history, a listing of the saved, older versions of the page, you can view previous changes to the page as well as reverse your entries. If it all was a simple and transparent experience, you were dealing with a wiki. Wiki technology enables virtually anyone to completely edit pages without difficulty. Yet that's not all – anyone can contribute significantly to the structure of the site, simply by creating new links and adding new pages. This openness is the innovative and amazing aspect of wikis. The title of a book on wikis by Bo Leuf and Ward Cunningham puts it in a nutshell: *The Wiki Way. Quick Collaboration on the Web*.

Tools

Wikis are downright fascinating tools. It has never been so easy to become a "correspondent" on the Internet, because the technical hurdles have been reduced to a minimum. People who hear about or use wikis for the first time often experience a bit of culture shock. "Anybody can come along and change my text!" is a popular reaction. The opportunities and consequences of free cooperation in the context of the typical work organization of our society inevitably lead to irritation, because we assume that a contribution from "others" will destroy our own work. We are simply not used to handing over control and responsibility – and to strangers at that. The Swedish data systems specialist Lars Aronsson writes:

"Most people, when they first learn about the wiki concept, assume that a website that can be edited by anybody would soon be rendered

useless by destructive input. It sounds like offering free spray cans next to a grey concrete wall. The only likely outcome would be ugly graffiti and simple tagging, and any artistic efforts would not be long lived. Still, it seems to work very well."[1]

Excursion

You can't quite imagine it yet? Then let's take a short excursion, and try out whether or not it is really as easy and free as it sounds. Get on the Internet and go to the site *http://www.wiki-tools.de*. Click on **Sandbox**. In this sandbox, you are free to experiment at will. Click on **edit**. Now, write over the existing text in the middle by typing your name or whatever else comes to mind. Then click on **Save page** below the text field. Congratulations! You have just made your first entry in a wiki.

Definition

A wiki is web-based software that allows all viewers of a page to change the content by editing the page online in a browser. This makes wiki a simple and easy-to-use platform for cooperative work on texts and hypertexts.

Note: Many wikis also correspond to the legal definition of open, free software. Most are subject to the GNU General Public License (GPL), which, among other things, prohibits a program from being converted into "proprietary" software. In this way, copyright laws prevent a program from being claimed as private property by a legal person for commercial purposes. Furthermore, the free use, distribution and editing of the program is ensured.

Origin

The first wiki, with the name WikiWikiWeb, was developed in 1995 by Ward Cunningham.[2] The software developer from Portland, Oregon is considered to be a pioneer in the development of new methods, such as object-oriented programming, design patterns or extreme programming. Because he was dissatisfied with conventional word processing programs, Cunningham searched for a new documentation system that would better suit the needs of programmers. His goal was a relatively simple software that would enable collective work on software codes that could be published immediately. The new program would automatically document all editing steps to make changes easier to trace (document history). Ultimately, the first wiki server went online and has been in operation ever since.[3]

Connotation

"Wikiwiki" is a Hawaiian word that means "quick" or "hurry". The name stands for the programming characteristic of wiki software in which content can be made available in a quick and uncom-

[1] Aronsson 2002.
[2] Leuf/Cunningham 2004.
[3] http://c2.com/cgi/wiki

plicated manner. As demonstrated below, there are a number of further developments of Cunningham's first Wiki, which we will subsequently discuss (MediaWiki, TWiki, bitweaver, ProWiki, etc.).

Note: When we refer to "wikis" below, we generally mean the concept, and less so any special implementation.

Functions

The use of wikis is dependent upon the goals of the community, organization or company that utilizes it. Although they were first intended for software development, they are now used in a variety of areas. Due to the further development of the wiki concept via various wiki clones,[4] wikis can integrate an increasing amount of functions.

Areas of Application

Generally, we differentiate between two application options with wikis: They can be used as tools in a closed work group, or they can be directed at potentially everybody over the WWW. Wikis serve as knowledge management tools in planning and documentation. They can also be utilized as an open, web-based content management system (CMS) for the editing and management of a web presence or

Fig. 1.1

[4] See Chap. 4 for wiki clones.

to supplement an existing CMS. You can use wikis as your internationally accessible notepad or as discussion forums for general and specialized discussions.

In the meanwhile, the most varied of institutions have discovered the advantages of wikis. Groups within the so-called civil society, such as the Austria Social Forum or the Chaos Computer Club, use wikis as an organizational aid. Wikis are employed in the classrooms of Swiss schools. Yet even companies such as SAP, Web.de, Motorola or British Telecommunications employ a wiki clone as a decentralized intranet, since, in contrast to conventional groupware, it is considerably more user-friendly.

Growing significance

Wikis are becoming increasingly popular. Primarily due to the success of the free online encyclopedia Wikipedia, wikis have become known to a wide audience.[5] At Wikipedia, the wiki concept is utilized to integrate and display encyclopedic knowledge "from the bottom up". In the German-language edition alone, over 540,000 articles were developed communally from May 2001 to February 2007. To date, however, the flagship of wiki technology remains the English language edition, for which, during the period from 2001 to early 2007, about 1.6 million articles were written. Worldwide, Wikipedia exists in more than 220 languages. According to Jimmy Wales, the founder of Wikipedia, the site, with 400 million hits per month by the end of 2004, was already more popular than the websites of IBM or Geocities[6]. Wiktionary[7] is an example of a wiki-based dictionary; Wikitravel[8] is an international travel guide. A few software instructional guides and aids (e.g. German Smalltalk User Group[9]) are based on wikis. Furthermore, wikis also serve as a professional information medium (e.g. Jurawiki[10]). Others have discovered wikis as an alternative form to forums and mailing lists.[11]

Potential

Basically, wikis are very young digital tools in which there is still great potential. Several further applications, such as learning systems or local news services, are conceivable. Wiki application opportunities for the self-organization of private or public organizations and businesses must be further discussed and tested. In addition, much more development of wiki software will also take place.

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[5] See Schwall 2003. Wikipedia is a successor project of Nupedia, also based on wikis.
[6] http://www.answers.com/topic/jimmy-wales-lecture-at-stanford-university-on-2-9-2005, 02/10/07.
[7] http://www.wiktionary.org
[8] http://www.wikitravel.org
[9] http://swiki.gsug.org/
[10] http://www.jurawiki.de
[11] See e.g. *WikiUserTypes*, www.twiki.org/cgi-bin/view/Codev/WikiUserTypes, 02/10/07.

Let us briefly summarize:

Non-linear hypertext structure

Firstly, the WikiWikiWeb server technology enables the creation of associative hypertexts with non-linear navigation structures: Typically, each page contains a series of cross-links to other pages. The reader decides which page he or she will view next. In cases where larger wikis employ hierarchical navigation structures, these structures still play a secondary role.

Easy and extensive access

Secondly, using wikis, the technical hurdles and prior knowledge required for communication in and design of the mass medium of the WWW are reduced to a minimum. It is characteristic of wiki technology to allow externally generated texts to be edited "on the fly". The entry and formatting of a text is usually done using a few simple rules. For instance, sequential lines are formatted into lists by placing a star or dash in front of them. Also, pages within a wiki can be linked very easily by writing a sequence of words together without a space and with each word capitalized (called WikiWord or CamelCase, e.g. HomePage) or by placing a text in brackets.

No client software

Thirdly, regular users (clients) require no additional software, but rather can navigate, read, or alter content within wikis using conventional browsers.[12] Similarly, no applets or plug-ins must be loaded by users. Extensive training is not required to participate in a wiki. Cunningham was right when he described the wiki as "the simplest online database that could possibly work".

Social processes in the foreground

Fourthly, the simplicity of the software is the condition under which a number of communities and projects have been able to develop.[13] Not only is the technology of wikis interesting, but also the "wiki philosophy" and the debates on social perspectives linked to its use. For Internet projects based on the wiki concept, the discussion of purely "technical" problems can generally take a back seat to work processes, content-related issues and the social connections of the project. One could say that the wiki concept undoubtedly marks a new level in Internet technology and its usage.

Simple usage and technical hurdles

If wikis are tools that are so easy to use, why would one need a 400-page book? Let us point out a differentiation here. As a normal wiki user, you require hardly any previous knowledge. If you would like to install and maintain a wiki as an administrator, problems may arise for which more detailed explanations are needed.

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[12] This means that, in contrast to comparable systems, wiki technology does not differentiate between "back end" and "front end".

[13] The relationship between project and community varies. For example, at Wikipedia, a community has developed around a free encyclopedia project. On the other hand, the MeatballWiki is only a community without a central project.

Between these two poles, plug-ins, for instance, offer a series of new possibilities that we would like to present. In addition: As easy as wikis generally are to use, the self-organizational processes that make wikis so fascinating can be very tricky. In such cases, introductory workshops may be necessary.

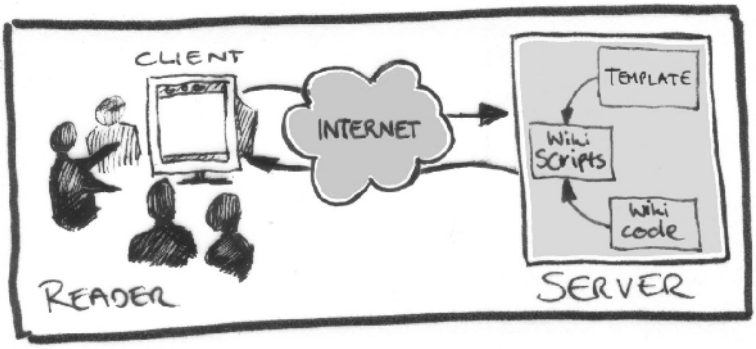
The fundamental principle of the wiki technology, however, is still simple. Let us have a closer look at the technical side of wikis.

1.2 The Technology of Wikis

Readers

Wiki-Software is installed as a script on a server. The server produces small documents, so-called wiki pages or articles, that can be accessed via a browser. The content of the wiki page itself is written as simple text and then stored in a file or database. When a wiki-based Internet page is accessed, the browser first sends a query to the server that administers the data sets containing the wiki software. This data, which is in the form of simple text, must now be formatted for display in the browser.

Fig. 1.2



To do this, the wiki script translates the file text (wiki code) or data set into HTML and embeds it in the web page (template) to be sent back to the browser. For example, the wiki script can be a PHP script that reads the raw page data from a MySQL database. This raw data is checked line for line, and the specific format commands contained in it are replaced by the corresponding HTML codes.[14]

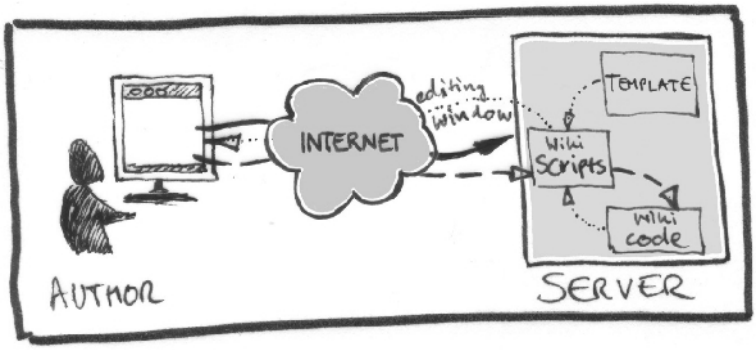
[14] In this step, all URLs are then clickable, and in place of all URLs that end in gif, .jpg or .png, in other words those displaying images, the corresponding image tags are set (the images themselves are subsequently loaded by the browser).

Subsequently, the page thus created is integrated in the layout template. Every wiki page has its own, distinct name indicating the subject of the page. In addition, there is usually a navigation menu and a few page-specific links of the displayed page. The most important of these links is the "Edit" link.

Authors

If this page is then to be edited, the **edit** button is used. This sends another query to the server. The same page is loaded again, only this time the contents are not converted to HTML format, but rather displayed in "raw form" in a large text field in an HTML form. The user can edit the text in this form and send a new version, which immediately replaces the old version in the database. When the page is accessed again, the new version is displayed.

Fig. 1.3

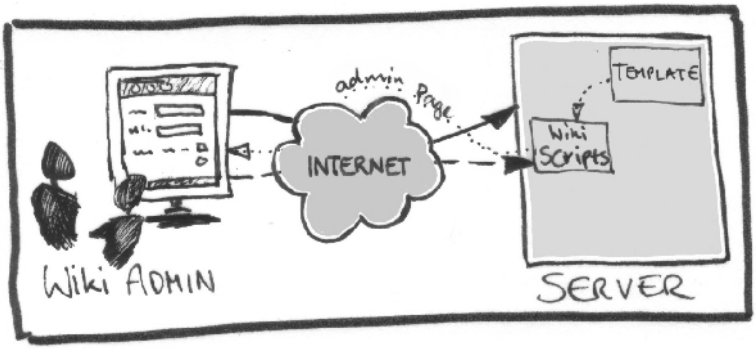


Visitors do not need to know any programming language or HTML in order to use wikis. Wiki pages are written in simple ASCII format, just like emails. There is a series of conventions that you should become familiar with sooner or later, but they are generally easier to learn and more "intuitive" than HTML. For instance, a blank line separates paragraphs. When this page is saved, the system translates the blank line to HTML, that is, it adds a <p> at the respective spot. The wiki link syntax, which we describe in more detail below, is also important.

Wiki Admins

The primary task of wiki administrators is to maintain wiki content and ensure the smooth operation of working in a wiki. They have more extensive rights than regular participants; for example, they can delete pages or block individual user access. To do this, wiki admins usually have their own interface or special pages in the wiki to which only admins have access.

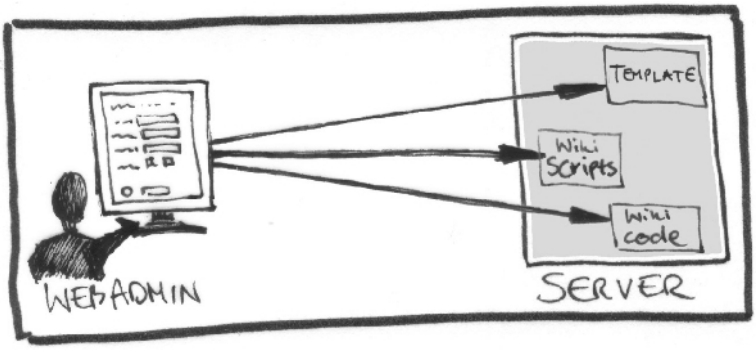
Fig. 1.4



Web admins

Yet even a wiki cannot exist without some technology. On this level, the web admin is in charge of software installations, maintenance and updates. In contrast to the other groups mentioned, web admins have direct access to files without needing to detour through the wiki interface.

Fig. 1.5



Level model

The categories mentioned up to now indicate a model which divides the access of participants into levels that differ technically in type and depth. We add to these the lowest level, which includes the infrastructure, the server and operating system, as well as the necessary software, web server and database. They are maintained by a system administrator.

Thus, while the system and web administrators have direct access to the server and must not necessarily be integrated into the wiki community, wiki administrators, authors and readers navigate the web-based interface of the wiki.

Using the idea of the level model, we can also clearly see that, in contrast to a normal HTML page, the interface with which content can be created is found in the client realm. This means that, from a technical standpoint, conditions have been established in which

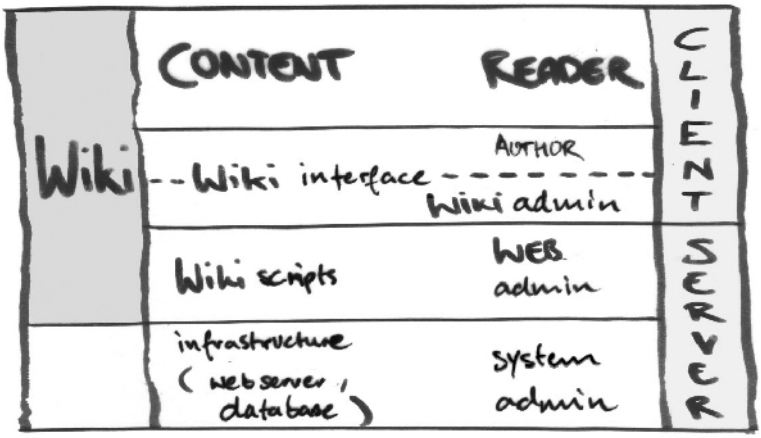


Fig. 1.6

a great number of people can participate extensively in the design of the content without needing to clear any major hurdles (such as access to the server).

1.3 Characteristic Wiki Functions

Regardless of the wiki script used, all wikis offer a few technical core functions, which we will only mention briefly here and later in more detail.

Editing. The **edit** button is the ultimate typical feature of a wiki. Only in extreme cases are specific pages excluded from the editing option. At Wikipedia, for instance, the capability of changing the title page has been made more difficult. A page can also be completely prohibited from editing. Since such blocking goes against the grain of the wiki philosophy, it should be avoided when possible.

Links. Each article can be linked to other articles and thus form a new network structure.

WikiWord/ CamelCase

Note: Links can be created in most wikis using a WikiWord: Words are capitalized and written together without a space (so-called CamelCase, which in itself is an example of such a WikiWord). CamelCase makes linking easy, but can also cause problems in some applications. That is why, in other wikis, links are generated by simply placing the title in square brackets. Regardless of which procedure is chosen, a link is thus generated that appears in the normal view.

If a respective linked page within a wiki does not yet exist, it can be created with a simple click of the mouse on that link. In this way, wikis support associative links between pages in that they design and display links in an almost intuitive manner, whether or not an intended link exists. The new pages are now linked to the existing ones and thus part of the hypertext structure.

History. This function basically saves all previous versions or modifications of any single page. Here, it is possible to exactly track the editing process of an article, since all changes have been documented. The "History" function allows a previous version to be opened and saved again, in order to restore the original content (rollback). This concept is based on Cunningham's editing history, and is also a useful tool against unfriendly users who wish to destroy the page. However, it is being used more and more for regular coordination problems. The history can roll all the way back to the first version, but can also be limited due to space reasons. More complex wiki clones offer a so-called "Diff" function, which displays detailed alterations between two versions, such that authors do not need to compare two texts line for line.

Recent Changes. This page either provides a current overview of a certain number of recent changes to wiki pages or all changes within a predefined time period. It is produced automatically and cannot be changed by users. Some wikis, such as MediaWiki, offer so-called watch lists. Such lists enable selected pages to be monitored over an extended period of time. If you are partial to a particular article, you do not have to continually look through the list of all changes to all pages.

SandBox. Wikis usually offer instructions and introductions on their homepage, which serve to facilitate working with the system. In addition, new users, as well as experienced ones, can use the so-called SandBox or PlayGround to learn how to utilize wikis and try out various solutions without having to use a regular page. You have already been introduced to the sandbox. This test environment is nothing more than a wiki page that is emptied on a regular basis.

Search functions. Most wikis also offer a classic full-text or title search for the wiki pages. Thus, articles in a wiki can be accessed quickly. It has been our experience that if titles are well-thought out, the search can function like an index card system.

1.4 Wiki Clones

With the development and utilization of the WikiWikiWeb, new challenges have emerged, and accordingly, new programs in which the wiki concept has been further developed. Meatball (itself a wiki community) claims that there are currently about 200 different types of wikis.[15] These programs are called clones, since they imitate the original Wiki, but have added a few extra functions. Most of them have the term "wiki" in their name. Here are just a few common examples:

UseModWiki is one of the oldest and most widely-used wiki clones. Written in Perl, they include several small programs that enable a variety of additional functions. UseMod has had a substantial influence on the development of other wikis, such as MediaWiki, whose formatting language (or, more precisely, its syntax) strongly resembles that of UseMod.

MediaWiki was conceived for the needs of the Wikipedia encyclopedia project. It consists of several scripts written in PHP, and contains a few further developments (name spaces, sidebar, and messages regarding processing conflicts).

PmWiki is written in PHP. The focus of its development lies in ease of use, in order to reduce obstacles which might keep people with little IT savvy from using a wiki. Simple installation and configurability are the hallmarks of this clone. With its attractive interface and ability to link namespaces with user rights, it could mean competition for MediaWiki.[16]

MoinMoin is a simple and very widely-used wiki clone written in Python. MoinMoin, whose name reflects a friendly northern German greeting, enables user registration and has a plug-in system for enhancements, among other functions. MoinMoin requires no database connection.

Bitweaver, a descendent of TikiWiki, written in PHP, already offers a whole series of useful features. It can stand up to a comparison with existing content management systems and groupware. However, in this case, the wiki is just one component – albeit a central

[15] Many wikis are listed under: http://c2.com/cgi/wiki?WikiEngines.
[16] An assumption not shared by the authors of this book ☺.

one – in an array of additional groupware features, such as forums, blog functions, newsletters, file and image galleries, and survey, chat or calendar functions.

The Perl-based **TWiki**, with its many plug-ins and features, is, in addition to TikiWiki, the most comprehensive wiki clone. TWiki implements wiki technology more consistently than bitweaver, because additional functions can also be realized with this technology to a large extent. TWiki, which was conceived to be utilized as a company intranet, is being used increasingly for commercial purposes, due to its high level of development.

The target group of **Dokuwiki** is primarily developer teams, work groups, and small companies. This simple wiki clone does not require a database and, due to its practical application, has attracted a number of fans.

ProWiki is written in Perl and primarily conceived for use in so-called wiki farms. Developers place great value in the ability to quickly generate subordinate wikis as copies of existing ones. In doing so, the features of the original wiki are transferred to the subordinated pages. ProWiki aims for high adaptability to a variety of demands within a wiki.

Wetpaint is a special example for a free wiki offering. With it, you can write your own wiki pages on a public domain. However, the wiki software itself is not freely accessible. Several similar commercial wiki clones, such as **Confluence** or **Socialtext**, were developed in the past.

Selection criteria

In the appendix, you will find a small tabular overview of important wiki systems. It cites a few criteria you should look for when selecting a wiki. Section V also contains further tips on selecting the right wiki.

1.5 The Wiki Phenomenon

Brecht's Radio Theory

Bertolt Brecht, in his so-called "Radio Theory", written in 1930, wrote that radio has one side when it should actually have two. "It is purely a distributive apparatus; it just rations out."[17] His now infamous proposal was to convert broadcasting from a distributive appa-

[17] Brecht 1930/1967, 129.

ratus to a communicative apparatus. "Radio could conceivably be the greatest communicative apparatus of public life, an incredible channel system; that is, it would be, if it were capable of not only broadcasting but also receiving, of thus being able to make the listener not only listen but also speak, and not to isolate him but connect him."

Just a few decades later, an innovative mass medium became available in the form of the Internet, which has markedly accommodated Brecht's technical demands of connecting broadcaster and receiver. This was just as much the case with the classic visual and audio media as it is with the "Internet revolution". Yet technology and new inventions alone do not change anything. A complex and difficult reciprocal relationship exists between social progress and technical innovation. We can analyze this relationship with the aid of the following questions: Who uses this technology? What goals and forms are involved? Upon what dependencies does he or she rely? Accordingly, wikis can be used in an emancipated manner – or not.[18]

1.5.1 Creativity Through Group Processes

Wiki effect

Yet beyond the question of the emancipatory potential of wikis is perhaps the question as to why the "wiki effect" even occurs at all. What we mean by "wiki effect" is primarily the self-organization processes that can be observed in well-known and successful wiki projects. It is astounding that people will independently research, organize, write and publish to provide the general public with a free service. For instance, communities have not only formed around the large Internet lexica that largely do without central control models. Their self-organized projects have, in the meanwhile, exhibited considerable successes.

Cathedral and bazaar

In such cases, it is often evident that the communication of large groups is much more effective and thus can react more flexibly to change than when using hierarchical organizational models. Such wiki projects are not the exception to the rule: Similar experiences were previously made with the "subversive" development of open source software (e.g. Linux). Eric Raymond, a well-known author and programmer in the hacker and open source scene, hit the nail on the head when he metaphorically differentiated the various management methods using the principle of the cathedral and the bazaar:[19] While conventional software development assumed that im-

[18] See: Ebersbach/Glaser 2004.
[19] Raymond 1999.

portant programs had to be built like cathedrals, "painstakingly chiseled by individual druids or small teams of high priests who worked in complete isolation and were not allowed to issue any unfinished beta releases, […] the Linux community seemed to be like a large bazaar of wildly intermingled voices having a variety of goals and approaches which could produce a coherent and stable system only through a series of miracles. The fact that the bazaar appeared to work, and work very well at that, was a downright shock."

The appeal of wiki technology lies in the act of rethinking the familiar. Once again, hierarchical control models are at our disposition, and with them, valid ideas of why and how, through the division of labor, complex problems can be solved and products produced and distributed. It is no less than a question of alternative socialization models whose possibility (!) becomes apparent.

Large-group dynamics

People repeatedly ask why wikis work. This question has to be posed more precisely: Why and under what conditions do people cooperate in wiki projects without central control and external pressure? Group processes are a much discussed and investigated topic in the fields of sociology and education; so much so that we cannot present it here in all its theoretical complexity. However, experiences with large group events have revealed a few principles which contribute greatly to the success of large group processes.[20]

Playful creation. "Why Wiki works? It's cool", is the brazen comment at Ward's Wiki. A loose, playful atmosphere and fun at work are important conditions for self-organized processes, because one's creative, social and practical skills can best be unfolded in such an environment. It is motivating when one can make his or her own designs or contribute an article for a large-scale project. Less attractive "obligatory" tasks do not necessarily fall by the wayside if their necessity is recognized.

Flat hierarchies. Flat hierarchies are decisive for creative, self-organized group processes. The responsibility for the entire process, not just for subareas, is transferred completely to those individuals performing that process. These responsibilities are integrated into the planning and workflow control processes as completely as possible. Newer methodological approaches for large-group events transfer workflow and goal definition responsibilities to participants and those concerned. This concept requires of its participants a willingness toward the open nature of the process, as well as an agreement to not only equally distribute the risks, but also the advantages.

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[20] Especially at open space conferences. See Petri 2000, Maleh 2000.

Projects based on the wiki philosophy require flat hierarchies. This can be seen, for instance, in the fact that participants contribute considerably to designing the organizational structure of the wiki, e.g. through linking. Yet social structures also develop within a wiki – and they often differ from those the initiators had initially imagined.

Modification pressure and the complex topic. The pressure to modify (as intrinsic motivation) and the will to want to solve a problem represent, according to Raymond, an indispensable motor for the "bazaar". Working on one's own topic creates dedication.[21] Self-organization processes build on a responsibility that stems from interest in the matter. Inevitably, in step with the wiki philosophy, incomplete or faulty wiki pages are bound to remain unedited for a time. Only after someone has deemed it necessary will the page be modified or existing errors corrected.

It is important, as Raymond has explained for the bazaar, to be part of a worthwhile cause and that improvements in which one is involved become apparent. In addition, a complex topic representing an intellectual challenge promotes the dynamics of large-group processes. They develop their full strength through a fascinating and challenging topic which can, by all means, have a high potential for conflict.

Simple system, simple rules. The decision to sit down and join in is the greatest obstacle for self-organization processes. Successful self-organized group processes are often founded on very simple basic systems, because favorable – if complex – decision-making and modification processes depend only on a rough overall concept, access to all relevant information and clear basic conditions. Thus, the conference model *Open Space* functions with just a handful of rules.

Wiki technology, with its low technical access hurdles, is ideal for web-based group processes. Several wiki communities have implemented simple codes of conduct.

Open access. Free will and open access are vital conditions for motivation in self-organization processes. The success of the bazaar principle as well as the wiki philosophy is based on the fact that discussions are removed from alleged expert and specialist circles, right from the start. This creates transparency and incentive.

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[21] Of course it makes a difference whether a goal is self-set or stipulated, or whether external goals have been taken on as one's own.

A large pool of participants testing the system is also a way to identify errors at an early stage. The system becomes more stable and can be more quickly adapted to the changing needs of its users.

For wikis, this approach is supported by the principle of "open postings". With wikis, users are invited to edit an existing page within their normal browser or add new pages. In contrast to the classic editing principle, articles are not first proofread and only published when completely error-free, but rather as soon as possible, so that users of a page can be integrated in the cooperative process.

Diversity of the participants. For the dynamics of self-organization processes and collaborative work, a climate of openness and mutual trust is necessary – despite inevitable conflicts. A variety of experiences, backgrounds and knowledge is seen as the basis of creative processes and as an enrichment, and thus, every user is initially recognized as an expert.

The wiki philosophy is based on the assumption that those individuals will become involved who also want to contribute to the situation. Their knowledge and motivation are sufficient to contribute to the issue. A certain degree of heterogeneity can also be observed in participants of wiki projects regarding their areas of interest.[22]

Extremely flexible scheduling. A relatively flexible scheduling of one's work time within an overall process is a further motivator. According to the bazaar principle, which knows no deadlines, it is possible to tailor one's work time to suit one's own rhythm and individual daily life. Work begins when the time is ripe, and ends when it is finished. It is less bound to fixed schedules. Time pressures exist only when problems remain untouched.

Self-determined work. People involved in group processes and members of communities have very different strategies and just as varied an understanding of their own function within the overall relationship. In addition, strategies and self-conception are subject to continuous change, such that it is difficult to determine certain roles or types – perhaps it is not even advisable. However, for better understanding, it would be helpful to consider that each individual – once freed from a socio-economic background – enters into relationships with other participants via a wiki in a very multifaceted manner. Cooperation in open wiki projects is attractive because strate-

[22] As in the case of many other Internet projects, we must mention the limiting factor that we expect the circle of active wiki users to continue to be limited to certain social groups for the present (keyword: digital divide).

gies, focal points, and work intensity can be self-determined to a large extent.

Reception behavior. We have to distinguish between whether and how often participants visit a wiki system, whether they read the articles fleetingly or closely, and whether they are searching for articles on a particular topic or across several subjects.

Writing behavior. With regard to writing behavior, there are a number of variations. Some visitors of a wiki never write there. Others proofread, edit the style and layout, and make small changes. Others still, the specialists, acquaint themselves in detail with a subject and contribute articles with a great degree of content. In comparison, "generalists" jump from article to article and bring in knowledge from other areas.

Structural behavior. This category refers to the extent to which responsibility for an overall project is assumed. It includes the question as to how intensively one participates in fundamental debates or voices considerations regarding general procedures. Some participants take on functions as mediators or moderators. Others assume regulatory tasks, such as checking orphaned pages. Accordingly, the technical administrators and maintainers also belong to this category. People in self-organized processes ideally receive functions through their authority and the trust they have earned through their work.

Social behavior. This category encompasses atmospheric aspects. It refers to the form in which criticism and encouragement are imparted. Does one enter the discussion with a provocative or cooperative stance? On another level, the organization of the social and cultural periphery is also part of this realm, such as a regulars' table or seminar weekends.

The forms broadly discussed here are naturally not pure, but rather overlap each other and evolve. Due to the interplay between the individual practices and goals, the overall relationship is continually restructured as a process. The members of a community have just as much of an effect on the individual through their actions as the individual does when contributing to the daily design of form and content of the community. All of these behaviors, including those that are passive and, in a broader sense, "destructive", are necessary to a dynamic community. However, the community can also be destroyed by them at any time. Knowledge of specific and general

group processes within a wiki community is still in its early stages. At the 21st Chaos Community Congress in 2004 in Berlin, Jimmy Wales presented some initial considerations using the example of Wikipedia. A few of the "types" he outlined serve to illustrate the degree of diversity.

- **Bees.** Wales describes as "bees" those participants who perform very important work and without whom Wikipedia could not achieve or maintain its quality. Nevertheless, they are the least recognized group. They include generalists and specialists. They provide important content articles, proofread texts or negotiate with difficult users.
- **Sock puppets.** This group is comprised of people who publish under more than one account. This is done for a variety of reasons. A few wish to preserve their privacy (such as a professor who also writes as a fan of Britney Spears but fears a loss of authority). For others, such as those using multiple identities to manipulate polls, it represents a despicable attack on the mutual trust upon which open editing is based.
- **Judges.** This is obvious. These are people who focus on conflict resolution and decision-making. They are active in juries and arbitration committees. They organize polls and further develop proposals for regulations.
- **Moths.** This rather strange label becomes clear when considering that "moths are drawn to flames", as Wales explains. Flames in this case refer to flame wars, that is, heated and often insulting verbal duals. While people who start aggressive flame wars generally do not enjoy a good reputation, Wales sees the fact that individual participants seek conflict and do not try to avoid it as not necessarily negative action. On the contrary, these discussions can lead to vital advancements.
- **Vandals** are a common problem in open editing systems. They willfully destroy content, and yet they pose a much smaller threat to the community than is generally assumed.
- **People "outside" of the wiki** are often overlooked in terms of their significance. They continue to develop wiki technology as programmers. Even those individuals who primarily develop wiki content in other communicative media (e.g. chats or mailing lists) also play a role.

1.5.2
Limits of the Wiki Philosophy

Wikis are not automatic "successes", much less a cure-all. Productive group processes are always faced with destructive practices that even the large wiki communities have to combat right from the start. In problem analysis, we need to differentiate between whether the group dynamics have stemmed from a constructive start to the process and then slipped toward the negative, or whether wikis are simply not being accepted as normal tools.

Lack of interest

If wikis are not being accepted as tools and are thus not integrated into the daily work routine, they share the same fate as several knowledge management systems. Usually one person alone does the writing, and the others only read. Or the wiki system is not consulted at all. There are several wiki systems whose possibilities cannot be fully unfurled due to a lack of interest or out of lethargy. The causes are manifold. Generally, social elements are underestimated when dealing with new software. More than a few users already have high expectations when a wiki system is made available, and are quickly disappointed when it is not met with immediate positive response. However: Even if the technical hurdles are few, using wikis must still be "learned;" people still have to be interested in or introduced to the system. This includes the realization that a wiki is never "finished" and that not everything is going to function properly right away. The fact that one is not dealing with a WYSIWYG system can cause apprehensions that need to be taken seriously.

The acceptance of wikis depends on the degree to which I as a person can truly benefit personally from using them. That is why it is still important that the wiki not be empty at the start, but rather provide a certain quantity of content that can be further edited or to which additions can be made. This also means that a small core group that uses wikis for itself and thus feels responsible for it is of great significance.

Social environment and working world

Using wikis, the work environment can be influenced, and at the same time, be dependent upon it. Using open systems in today's working world is met with many types of resistance. The lack of willingness of managerial persons (project managers, area managers, etc.) to permit open systems in private companies is only one example.[23] However, the same thing can occur in authoritarian organizational structures.

[23] Even in companies in which hierarchies are being disassembled, this does not necessarily translate into a higher degree of transparency of company structures.

High workload, family and social responsibilities or social security worries often allow little room for free forms of cooperation which are admittedly also complex.

Vandalism

Let us return to the issue of "vandals" and vandalism. It has generally been observed that in wiki projects, destruction and/or damage remains relatively insignificant. It is assumed that cracking an open system poses no great appeal to "serious" crackers. The WikiWiki-Web server principle provides its own evidently effective antidote in its version control. It enables the previous version to be restored at any time. In systems with a high visitor frequency, disturbances can be detected quickly, as systems with several participants tend to be more "stable". Wikipedia, for instance, places pages that are frequently damaged on a separate list, to which the administrators pay special attention. According to an IBM study, incidences of deliberate destruction at Wikipedia are often eliminated within five minutes: "We were surprised at how often we found vandalism, and then surprised again at how fast it was fixed,"[24] reports Martin Wattenberg, a researcher at IBM TJ Watson Research Center in Cambridge, Mass. The fact that many people can control the process and anyone can take instant action is the most significant element in the quality control of large, public wikis. It only requires a corresponding sense of problem awareness on the part of users, who anticipate such attacks. Yet even willful alterations to small details can greatly inhibit the quality without being immediately noticed. Another – last – method has already been mentioned: blocking a page – which means the end of the wiki philosophy for that page.

Attention-seekers

Greater problems stem from people who use wikis as a platform for attention-seeking or those who do not wish to conduct discussions cooperatively. Provocation and posing general questions can be useful in breaking through a rut in thinking. Various opinions on a topic often develop into "editing wars". So-called trolls knowingly incite flame wars with lengthy, superfluous or provocative articles. Such conflicts, which contribute nothing to the issue, cost a great deal of energy. "Wiki pages represent consensus because it's much easier to delete flames and spam than indulge them."[25] In many wikis, trolls are kept away from the articles through discussion pages, so that, where possible, they only need to vent on this meta-level without "adding noise" to the real content[26]. In addition, at Wikipedia, a few mediation procedures and open instances have been established, such as ad hoc mediation commissions or openly-discussed exclusion petitions.

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[24] IBM 2003.
[25] Why Wiki Works, http://c2.com/cgi/wiki?WhyWikiWorks, Feb. 10 2007.
[26] Aronsson, 2002.

In very stubborn cases, there is also the opportunity to block certain users for a limited period or forever, using an IP list. In order to promote transparency and exclude arbitrariness, users can access a list of blocked users at any time and find out about the initiator and grounds for exclusion. Such blocking of certain IP addresses, in turn, leads to the problem that non-excluded users may be mistakenly barred from having continued access.[27] A further problem is that the disruptive parties can re-register at any time under a new name.

In his book "Die heimliche Medienrevolution" ("The Secret Media Revolution"), published in 2005, Möller provides a comprehensive look at the problems and possible solutions in dealing with difficult controversies and vandalism in blog and wiki community environments.[28]

Project portal excursion

The best overview of the discussion culture and decision-making processes can be had with a visit to Wikipedia. Let us take a short excursion to the project's Community Portal page.[29] Here, we find guidelines and conventions, discussion pages for admin candidates, moderation information and pages collecting opinion statistics. Completed problem cases are documented on the arbitration committee page. And of course, a visit would not be complete without taking a look at some of the discussion pages of individual articles.

Quality assurance and Wikiquette

As we can see there: For quality assurance and conflict resolution, a few mediating instances, rules and practices have formed at Wikipedia. We find name and formatting conventions; well-made articles are presented as examples, and quality offensives are being performed in certain topic areas. A Wikiquette offers recommendations for cooperative communication with other users:[30] Suggestions such as assuming the good intentions of other users, objectivity, mutual help and encouragement, and kindness are proposed, as is the advice to keep cool in conflicts that will inevitably crop up. After all, there are always the arbitration committees. And yet, the overall character remains true to its democratic fundamental principles. Anything else would cause the project to fail.

Neutral Point of View

One especially touchy subject is the credibility and objectivity problem. At Wikipedia, this is addressed, among other ways, under the heading "Neutral Point of View". Since many people from around the world and having the most varied of political and religious views take part in the project, Wikipedia is obligated to formulate articles as neutrally as possible. The point is not to write them as objectively as possible – this is a common misunderstanding – but to

[27] Since IP addresses are not always issued on a permanent basis.
[28] Möller 2005. To an extent, also in: Möller 2003.
[29] http://de.wikipedia.org/wiki/Wikipedia:Portal, Feb. 10 2007.
[30] http://de.wikipedia.org/wiki/Wikipedia:Wikiquette, Feb. 2 2007.

present all aspects of an issue. Most wiki users have thus learned to express themselves in a conflict-free way, insofar as possible. Instead of writing "Apples taste good", one would instead write "Some people like the taste of apples." We will address the issue of apparent neutrality at the end of this book.

Open editing

Giving up the author principle is an aspect of collaborative work. It leads to a few questions: Is someone who has contributed to collaborative texts legally accountable? Who is the author? It is true that traditional newspapers and encyclopedias also represent a collection of articles by a variety of authors, but in open wikis, there is no traditional relationship between publisher and author. Wiki texts are thus not directly subject to the compulsion of marketability. In such cases, the individual author, on the one hand, receives a much stronger, more independent role, while, on the other hand, he disappears in the open system as an individual author at the same time.

Open text

A further area of interest is the issue of ownership and copyright. Since many individuals contribute to content, the question must be clarified as to whether anyone can claim copyright on individual articles or even the whole collection. Wikipedia, for instance, allows every user the right to protect his or her own contributions. However, when the page is being saved, the user is informed that he or she may only benefit from one type of copyright, namely the GNU Free Documentation License (FDL). In short, this means that anyone may copy and use the text for other purposes as long as he or she makes the original text available to other readers, which is most easily done by linking to the Wikipedia URL.[31]

Another question which arises deals with how materials protected by copyright are used in wikis, and who is responsible for any arising damage. To date, there has not yet been a precedent case. However, the law in most European countries differentiates between newspapers having an editing department for which a publisher is accountable and bulletin board systems or services of an Internet provider, where individual users bear the responsibility. Wikis are more likely to be categorized with the latter.

Careful optimism

Wikis will also have their share of problems and setbacks. The wiki philosophy may see some things too optimistically. Nevertheless, previous experience has given reason to adopt an open and optimistic stance toward these developments. The problems known to date and mentioned here do not negate any grounds for optimism; if one considers human relationships as being permanent collective learning processes, one cannot simply say, "people are the way they are", and stop there. Instead, one must question the causes for obsta-

[31] Aronsson, 2002.

cles to "learning" (prejudices, insecurities, lack of complete understanding of group processes). Brecht's comment on "Radio Theory" is good advice for dealing with the "impossibilities" of wikis:

"Not feasible in this social order, feasible in another, the suggestions, which are only a natural consequence of technical development, serve the propagation and form of this other order. [...] If you should consider this utopian, I kindly ask you to consider why it is utopian."

1.6 Wiki Pages

Pictures are worth a thousand words. That is why we would like to present a few sample wiki pages on the following pages. We used no special criteria in selecting these examples; moreover, we wish to convey an impression of the diversity of wiki software.

TeacherWiki *(http://teacherwiki.pbwiki.com):* An open platform for teachers to collaborate and share knowledge on education, curricula, instruction, resources and technology.

Recipes Wiki *(www.recipeswiki.org):* A free collection of cooking and baking recipes to which anyone can contribute easily and without registration. Includes integrated cooking videos.

Wikitravel *(www.wikitravel.org):* Project with the goal of generating a complete, current and reliable international travel guide whose content is freely accessible.

Open Guide to Boston *(boston.openguides.org):* One example from the Open Guide travel guide.

DorfWiki (VillageWiki) *(www.dorfwiki.org):* Virtual wiki-based meeting, learning and workplace to which anyone can and is encouraged to contribute who cares about the topic of "villages" and all things "village-like".

Memory Alpha *(www.memory-alpha.org):* Free, community project for the generation of a comprehensive encyclopedia all about Star Trek.

1.7 Important Resources on the WWW

c2.com/cgi/wiki?WikiEngines WikiEngines on Wards Wiki lists a number of Wiki engines, including categorization according to programmer language.

usemod.com/cgi-bin/mb.pl The English language Meatball Wiki is a platform for practitioners concerned with online communities.

www.wikimatrix.org On WikiMatrix, approximately 70 wiki clones can be compared with one another.

www.opensourcecms.com OpensourceCMS offers the opportunity to test the most popular open source CMS and wikis.

www.wikiservice.at/gruender/wiki.cgi?StartSeite The Gründer-Wiki (Founder Wiki) is a German-language site comparable to Meatball Wiki.

wiki.LIBERAL *(https://my.fdp.de/wiki):* Online dictionary concerning Germany's FDP (Free Democratic Party). A site where information about the FDP, its programs and history can be collected.

Placeopedia *(www.placeopedia.com):* A wiki that links Google Maps and Wikipedia articles.

Semapedia *(semapedia.org):* Its goal is to link the virtual world of Wikipedia with the real world using Semapedia tags, which are physical hyperlinks that can be read by cell phones.

http://www.springer.com/978-3-540-35150-4

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