From printed to "wikified" encyclopedias: sociological aspects of an incipient cultural revolution

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From printed to “wikified” encyclopedias
Sociological Aspects of an incipient cultural revolution

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"You can never step into the same Wikipedia twice."
(paraphrasing Heraclitus).

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1. Introductory remarks

The success of the Wikipedia is spectacular insofar as it contradicts most current common sense assumptions as well as almost all conventional theories about human motivation and social organization.
Even the founders – who originally aimed at a conventional elitist project (Nupedia) - were completely surprised by the processes of incessant growth and expansion they have inadvertently kicked off in January 2001 when the English WP was started.

“A quarter century ago it was inconceivable that a legion of unpaid, unorganized amateurs scattered about the globe could create anything of value, let alone what may one day be the most comprehensive repository of knowledge in human history. Back then we knew that people do not work for free; or if they do work for free, they do a poor job; and if they work for free in large numbers, the result is a muddle.” (Marshall Poe 2006).

Ironically, the most central premise of WP (that the "swarm intelligence"[1] constituted by all contributors together surpasses any individual wisdom) is regularly compromised by the very inaccurate collective predictions users make about the further development of their own project. For example, when English WP users were invited to guess when the 1 millionth article will be posted (actually at March 1 2006), more than 220 of them overestimated the time needed considerably, while only 46 were about right (or somewhat below the actual time).[2]

From a sociological point of view, there are three major reasons for studying the Wikipedia: because illustrates so profoundly how modern human society and culture is to be reshaped and transformed by the Internet and its still unexplored future potentials of global digital communication.

1) On the *macrosociological and macrocultural level*, studying the WP provides insights how the shift from the printing era to the digital age goes along with revolutionary new ways to produce, organize, distribute human knowledge, and how such transformations affect the worldwide interrelationships between different institutions, collectivities, nations and cultural regions. In particular, we see that millenia-aged patterns of monocentric elite-guided cognitive systems give way to more open, dynamic and polycentric knowledge cultures, and that knowledge may become more independent from money and power as well as from the sphere of formalized education and academic credentials. Thus, the question arises how these changes affect the complexity, scope and dynamic adaptation of human knowledge, its relationship to political, economic and academic-scientific spheres, its coherence and acceptance thru different cultures and demographic strata, and its characteristics on substantive and epistemological levels.

2) In a *mesosociological perspective,* the WP (like Linux) contradicts the established (Weberian) wisdom that complex cooperative performances and products can only

[1] see Kennedy/Eberhard 2001
[2] http://en.wikipedia.org/wiki/Wikipedia:Million_pool#March_2005

be realized in centralized and formalized settings of bureaucratic organization. Instead, we see that some of the most complex of these productions can evidently also take place in informal, decentralized open source networks continuously activated by unpaid volunteers who deliver their contributions according to their own preferences and judgments; without overall blueprint planning, formal role assignments and hierarchical controls.
After six years of unimpeded evolution, the Wikipedia has grown into a complex organization from which many insights about the preconditions, functional prerequisites, consequences and limits of open source network communities can be gained.

3) On the *microsociological plane*, finally, the Wikipedia begins to change the basic ways how individuals (or small groups) search, select, retrieve and apply knowledge on their workplace, in school, as medical patients or voting citizens or in any kind of private situation. Particularly impressive are the new potentials to access relevant knowledge without cost and delay under almost any circumstances and role conditions (even while on the move); and the capacity to enact self-guided learning processes by navigating through hypertext structures in a personalized fashion. In addition, we see former passive "readers" to be transformed into versatile "users" who switch flexibly between receptive and contributive roles, and to use encyclopedias in a prosaic instrumental fashion - not to be compared with the intimidating status display effects emanating from by thirty-something exclusive leather backed tomes on polished Mahogany shelves.

Unquestionably, the breathtaking complexity and dynamics of the WP makes it extremely difficult to reach a sound, scientifically founded judgment of the project as a whole, especially its multicultural dimension. Thus, there may never be comparative study that include more than some few out of the 250 WP's worldwide - simply because no research team is acquainted with so many languages. And many studies on the accuracy or comprehensiveness of the reported information may be curtailed because any findings become quickly obsolete as a result of incessantly ongoing updating and modifications.
As a consequence, the following passages have the more modest aim to carve out some insights on a more general level (by comparing printed and wikified encyclopedias), and to illustrate the arguments with anecdotal evidence from only three major Wikipedias: the English, German and French.

2. The new "asymmetric competition" between open source networks and conventional bureaucratic organizations

When the Internet became popular some ten years ago, many pundits predicted that like all the preceding conventional media (press, radio and TV), it would soon become commercialized and dominated by professional groupings and large bureaucratic organizations. However, the subsequent developments provide little support for such upbeat economic expectations.
On the one hand, the "Dot.com Crisis" of 99/00 has illustrated that many business models imported from the era of top-down (or: one-to-many) communication were ill-

suited in the new Net environment where everybody had the same technical means for creating, transforming, storing, copying and transmitting information. And secondly, the decentralized and interactive features of the new medium have recently come to dominate in unprecedented spectacular ways: particularly in the rising prominence and significance of and user-created content.
First of all, it is striking that the biggest and most successful players on the Web are those that rely on "bionic software" (You Mon Tsang)[3] by aggregating and analyzing the information generated constantly by millions of users.[4] By exploiting the "Long Tail" (Anderson 2004) of less competent and irregular users, they gain more knowledge and produce more useful services than conventional enterprises that typically focus on a much smaller number of "essential clients".[5]

On a most elementary level, *Bit Torrent* exemplifies this basic principle of Web 2.0: those services improve with increasing number of users, because everybody contributes his own computing and storage capacities of his personal computer:
"....every BitTorrent consumer brings his own resources to the party. There's an implicit "architecture of participation", a built-in ethic of cooperation, in which the service acts primarily as an intelligent broker, connecting the edges to each other and harnessing the power of the users themselves." (O'Reilly 2005).

On a more complex level, *"eBay enables occasional transactions of only a few dollars between single individuals, acting as an automated intermediary. Napster (though shut down for legal reasons) built its network not by building a centralized song database, but by architecting a system in such a way that every downloader also became a server, and thus grew the network." (O'Reilly 2005).*

Similarly, *Google* and similar search engines base their algorithms of page ranking on the surf activities of users and on the hyperlinks set by all webpage producers (Barnett 2005); *Amazon* derives its attractivity from methods of collaborative filtering from which users get recommendations about what they shall buy next.; and in the case of *"del.icio.us"*[6]*,* thousands of users coproduce a search engine based on the public exchange of bookmarks and the "tagging" of visited sites.
In all of these cases, the Web as a platform gives rise to new manifestations of "emergence": in the sense that qualitatively new "molar" products arise out of the combination of a very high number of (sometimes extremely tiny) "molecular" contributions.

Secondly, we can observe the rise of the "Blogosphere" as a new non-commercial and non-professional arena of interactive public discourse: challenging the traditional monopoly of the monological "mainstream media" to steer the public agenda setting and to shape public opinion.

And *thirdly*, we are most fascinated by the rise of peer-to-peer networks that successfully compete with big corporations (or interorganizational systems) in generating goods and services of the highest complexity mankind has ever produced. Thus, P2P

[3] http://radar.oreilly.com/archives/2006/03/bionic_software_1.html
[4] http://www.nielsen-netratings.com/pr/PR_060810.PDF
[5] For extensive discussions on the Long Tail concept, see the Blog http://longtail.typepad.com/the_long_tail/
[6] http://del.icio.us/

file sharing networks are easily capable of substituting the conventional music industry in distributing songs on a worldwide basis; by pooling their excess computational capacities, 4.5 million PC users are able to constitute the most powerful supercomputer on earth (SETI@home) for searching signs of extraterrestrial civilizations; thousands of networked software developers are able to compete with Microsoft's in producing GNU/Linux, an operating system comparable to Windows; and innumerable of unauthorized collaborators pool their knowledge to create the Wikipedia: an encyclopedia that matches or even surpasses the Encyclopaedia Britannica or the German "Brockhaus" in at least some crucial ways.

As seen most succinctly in the rivalry between Microsoft and Linux[7], the emergence of open source communities has given rise to an "asymmetric competition between social organizations that produce very similar products, but with completely different (even antagonistic) cooperative structures:
"On the one side, a single software provider, whose massive installed base and tightly integrated operating system and APIs give control over the programming paradigm; on the other, a system without an owner, tied together by a set of protocols, open standards and agreements for cooperation." (O'Reilly 2005)

Such "open content communities" (Reagle 2004) or networks of "commons-based peer production" (Benkler 2006) are characterized by at least twelve common characteristics that set them in a sharp contrast to conventional bureaucratic organizations:

1) The Internet is used as the major or even sole medium of cooperation and coordination, so that collaborators can be recruited worldwide and no gatherings on specific times at specific places have to take place.

2) Everybody with an internetted computer is free to participate; no preconditions for entry are specified and no selective recruitment procedures are applied.

3) All collaborators are initially "equipotent" irrespective of age, education, wealth, formal power or any other exogenous status differentials. Consequently, internal status differentials are exclusively based on endogenous criteria: particularly on the significance, quality and continuity of individual contributions.

4) There is no formal "membership" in the sense of a basic status of belongingness associated with specific working duties and the assignment of a specific role. Instead, collaborators remain free to define their levels and ways of contributions voluntarily on a day-to-day basis – so that their participation remains highly compatible with any other activities and social roles.

5) Extrinsic rewards are minimized because performances are not paid and participants cannot hope to gain personal reputation because their contributions are anonymous brickstones of a collective production. Therefore, intrinsic motivations dominate: e. g. satisfactions arising from successful problem solving or from being part of a very large, ambitious and innovative collective endeavour.

[7] see Kuwabara 2000

6) Production costs in general and capital investments in particular are conspicuously low. Typically, the “means of production” (like PCs and software licences) are privately owned and have no calculable cost because they are already available for other purposes. Open source networks typically thrive on non-committed “discretionary resources” as they constantly emerge in more developed societies: excessive computational and storage capacities in computers, unused bandwidth in network connections, leisure time and free-floating skills of individuals, and free dispositions for collective attachments and social communication.

7) Management functions are minimized because most processes of role assignment, coordination and control take place on a horizontal peer-to-peer basis. However, centralized guidance seems necessary for founding the project, defining its mission and for creating and implementing essential explicit norms.

8) The weakness of centralized authority (and managerial “organizational culture”) has to be compensated by a strong “community culture”: widely shared values and norms that are upheld against deviant participants and disturbing external intrusions.

9) The rigid dichotomy between “producers” and “consumers” gives way to the hybrid role of “users” who adopt active and receptive roles alternatively, according to their own choice.

10) Production processes are continuous, so that products are evolving through an infinite number of intermediate stages. Thus, they are unpredictable and open-ended: not guided by specific deadlines and not aiming at pre-defined results.

11). Production processes do not take place behind organizational gates and walls. Instead, they are publicly visible, so that any that everybody can always verify what is going on and intervene when need arises.

12) Collaboration results in freely accessible public goods that cannot be privatized afterwards (e. g. by setting them under “General Public Licence” (Bauwens 2005)).

Of course, these twelve features are functionally interrelated. For instance, the lack of payment is caused by the fact that products cannot be commercialized, and it has the consequence that no selective recruitment practices, hierarchical controls and rigid working duties can be implemented.

While we all know that voluntary activities are quite competitive with formalized organizations in many modest productions or services (like cutting hair or cooking a meal), we are astonished to realize that nowadays, they seem to challenge bureaucracies also in the realm of the most complex products of goal-directed human cooperation: e. g. computer operating systems and encyclopedic works.

3. The Wikipedia as an encyclopedic project

It is no doubt that the Wikipedia aspires to be an “encylopedia” in the precise sense of this highly traditional term, because in his article “What the Wikipedia is not”[8], founder Jimmy Wales takes great care to deny explicitly that it is something else: a dictionary, a news feed, a collection of essays, an instruction manual, a repository of links, a directory or (horribile dictu) a vehicle for propaganda, self-promotion and advertising. Of course, this insistent explicitness is absolutely necessary because thousands of contributors all over the planet have to be precisely instructed so that they are enabled to behave conformingly and to recognize and correct deviant entries.

It is advisable to have a short look on the glorious tradition within which the Wikipedia insists to place itself – despite the cogent insight that by passing from paper to the Internet, literally *everything* is different than it was ever before.
In its extensive article on the concept, the Encyclopaedia Britannica defines encyclopedias as *“summaries of extant scholarship in forms comprehensible to their readers.”*
As such they have existed since 2000 years in very different size and format and as products of highly variable (individual and collective) modes of compilation. The term “Enkyklios Paideia” originally implies that all human knowledge can be represented in a closed circle and mirrors an ordered cosmos that can be explicated in a consensual and definitive way because human knowledge is thought to basically stable and the world to which it refers not subjected to fundamental change.
Typically, encyclopedias are representatives of cultural epochs that (aim to) synthesize its most authoritative and respected knowledge in condensed form. As a consequence, the most comprehensive editions also tend to be written in the language in which most contemporary knowledge is produced (Latin in the middle ages and English today).
Encyclopedias typically address themselves to “interested educated laymen” who are consulting them in matters where they are not experts, but on which they are able and motivated to acquire reliable basic knowledge. As a consequence, such works have to strike the right mean between a high-level educated language and a simple, widely readable style. This also implies that the best contributors of articles are often not the most eminent scholars (because they are often too much absorbed by current research), but many second-rank experts (e. g. teachers, writers or officials) who have professional reasons to acquaint themselves intimately with a particular topic or who have accumulated their knowledge in the course of their occupational experience or institutional career. They induce such contributors to do their best to clad their specialized elitist knowledge into a more popular form, so that rather broad strata of “interested readers” are able to understand the texts without consulting auxiliary sources (like dictionaries etc.).

In many conventional encyclopedias, there was no guarantee that each article stems from an expert in the corresponding field. In Diderots Encyclopédie, for instance, about three quarters of all articles are said to have been provided by a single collaborator (Chevalier Louis de Jaucourt).

[8] http://en.wikipedia.org/wiki/WP:NOT

Until the Renaissance, most encyclopedias didn't address to a general public, but to specific elite socialized within a specific circles or formal formalized settings (e. g. clerics). The printing press then has given rise to a much less circumscribed, anonymous readership: consisting of expanding bourgeois strata, academics and "intellectuals" who have acquired knowledge by self-education or on other informal ways.
In the course of modernization, encyclopedias have changed due to the rapid expansion and fragmentation of existing knowledge on the one hand and the growing divergences of different knowledge spheres on the other.
Thus, earlier cosmological architectures have given way to neutral alphabetical orderings of articles, because societal consensus about ontologies and the priority of different knowledge spheres has evaporated. And tight connections to educational systems and powerful cultural elites have been loosened, because knowledge became increasingly distributed broadly among various population segments (even rather marginal and politically dissident groups). In addition, ambitions of authoritative knowledge codification were abandoned; many more recent encyclopedias can be rather understood as a reaction to rapidly increasing flows of new publications: by satisfying the need for shorter digests that provide easily accessible information and orientation (Yeo 2001).
A major step in this evolution was the appearance of Diderots "Encyclopédie" (between 1751 and 1772) that was promoted and realized by pre-Revolutionary intellectuals who maintained a critical distance toward classical authors, and even an overt hostility toward the reigning political and religious regime (Munzel 2003).

Objectivity was particularly cultivated in highly "eclectic" epochs characterized by highly pluralistic cultural elites; e.g. in the encyclopedias of the old Roman Empire like Pliny's "historia naturalis", and in the 19th century.where cultural pluralism gave rise to highly objectivistic compilations (like the German Brockhaus) devoid of all ambitions to synthesize knowledge systematically or to transmit it in a pedagogical fashion.

While these traditions persist until the present, the 20th century gave rise to huge governmentally sponsored encyclopedias whose mission was to reflect the knowledge culture of a specific nation. However, even highly authoritarian and totalitarian Regimes (e. g. the Soviet Union or Italy under Mussolini) have produced encyclopedias in which most subjects are treated in a rather open-minded, non-ideological way. By compiling existing knowledge from a multitude of sources, encyclopedias seem to be disposed to affirm the autonomy of objectivistic cognitive orientations vis-à-vis the restraining influence of powerful societal actors, reigning ideological fashions and established cultural institutions.

In the following, it shall be demonstrated how the Wikipedia fits into this encompassing history of human endeavours to articulate and transmit the essential canon of knowledge of a specific epoch or culture. On the one hand, it is easy to show that the migration to an interactive online hypertext format is a necessary step in order to realize encyclopedias adapted to the conditions of contemporary societies, because traditional paper editions are not able to keep pace with the amazing manifold, complexity and dynamic change of science and other current cognitive cultures. If the Internet did not yet exist, it would have to be immediately invented in order to secure the continuity of encyclopedic ambitions. On the other hand, it is also evident that by

trying to realize old ideas with new technologies, something radically new is emerging for which we don't yet have adequate terms and definitions.

Within the short history of the Internet, the Wikipedia stands out as one of the most successful non-commercial Web projects at least in quantitative terms: Since its inception in January 2001, it has forked out to about 250 languages comprising more than 5 million articles.[9]
The English version alone has grown to about tenfold the size of the Encyclopaedia Britannica and is currently adding about 50 000 new articles each month.[10] In Sept. 2006, comScore has reported that with 154 Mio. unique visitors per month, Wikipedia.org was occupying rank twelve worldwide (behind giants like Google, Microsoft, Ebay and Amazon).[11] With 56 millions monthly visitors, the English Wikipedia occupies rank 10 of all English websites, while the German version maintains even rank 6 among all German-speaking sites (with 8.9 million visits in June 2006).[12]
The site's traffic is heavily boosted by Google which places Wikipedia entries regularly at the top of search result lists.

Concerning criteria of quality, judgments are highly controversial and difficult to verify objectively, because the system is so big and volatile that nobody is able to cognize and evaluate it as a whole. While fundamental criticism abounds in many publications[13], websites and discussion fora, one of the leading researchers of open source networks, Yochai Benkler, concludes intuitively that *"most of the commercial, proprietary online encyclopedias are not better than Wikipedia along any clearly observable dimension. (Benkler 2006: 168).*
By comparing 42 articles of the WP with 42 analogous entries in the Encyclopedia Britannica, the prestigious magazine "Nature" found that the average number of errors was 2.92 in the EB and 3.86 in the _WP - thus concluding that the level of correctness is rather similar in both publications.
More intransparent are the differences in softer spheres of human knowledge (e. g. in the social sciences, arts and history), because inadequacies can less easily (and less consensually) be assessed.

These spectacular achievements contrast with the very modest costs involved in building up the system and in running the whole enterprise. Founder Jimmy Wales is managing his enterprise with only four full time collaborators and a small yearly budget of about 1.5 million Dollars (provided mainly by small donations between 50 and 100 Dollars bestowed to the "Wikimedia", the supporting mother corporation).

With such very small financial investments, the WP has reached the most supreme status that can be reached in the Internet:
- the status of a "portal site" that serves as an entry page for million of users;
- the status of a one stop reference site not only for lay users, but for professional "multipliers" like journalists or teachers who disseminate Wikipedia knowledge in all other media. It cannot be denied that the Wikipedia has factually become a serious

[9] http://stats.wikimedia.org/EN/TablesWikipediaZZ.html
[10] http://yro.slashdot.org/article.pl?sid=06/07/10/2224223
[11] http://avc.blogs.com/a_vc/2006/05/comscore_world_.html
[12] http://www.spiegel.de/netzwelt/netzkultur/0,1518,429099,00.html
[13] See for instance Lanier 2006.

competitor to Encarta, Columbia, Grolier, EB or other conventional encyclopedias, because it is increasingly used as a unique reference source for reliable information.

A rather valid indicator for this growing reference status is the rising frequency of the phrase "according to Wikipedia" on a rising number of WebPages. In May 2005, this expression got already 22 000 hits on Google, in January 2007, this number has already risen to 740 000 in January 2007.[14]In addition, there are very likely innumerable copyings of Wikipedia material without indication of the true source. Such hidings are very common because WP citations are still very much discouraged, especially in academic settings.

Thus, the Wikipedia provides vigorous evidence that some highly optimistic expectations about human online behaviour may under certain conditions be true – despite the fact that they collide fundamentally with traditional common sense assumptions and established theoretical views:

- that user-created content provided by unpaid voluntary collaborators can be highly attractive to worldwide web publics;
- that widely respected knowledge results from highly anarchic production processes at which everybody can participate without any (academic or other) credentials ("out of mediocrity, excellence");
- that thousands of unpaid collaborators can be found worldwide that engage in highly demanding work for purely intrinsic reasons: making contributions that do neither add to their material wealth nor to their personal reputation;
- that a highly complex worldwide collaboration network can survive and continuously expand on a highly informal and non-economic basis: without being supported by large amounts of money, paid administrators and formal bureaucratic rules and sanctions.

4. “Wikis” as tools for focused and cumulative intellectual productions

A major shortcoming of the “dead wood era” was that for mere physical reasons, writing on paper does not lend itself to higher levels of collective cooperation. Just because it is cumbersome (or plainly impossible) to circulate paper sheets so that everybody can add his contributions, the notion of individualized authorship is reinforced. Such high "transaction costs" are a major reason why the production and application of knowledge is still characterized by a rather low division of labour. (Teece 1988; Ciffolilli 2003). In fact, most intellectual work has remained on a primitive “handicraft” level: contrasting increasingly with manual labour which got ever more collectivized in the course of industrialization.
Thus, not only "monographies", but even many "encyclopedic" works tend to be mainly anthologies of articles written by individual authors. Cooperation is largely restricted to the intervention of an editor (or editing committee) that may modify or shorten the article of give it back for revision. Collective cooperation is mostly con-

[14] In comparison, there were only 26500 hits for the phrase "According to the Encyclopaedia Britannica" (in Jan. 2006).

fined to the “molar level”: interrelating articles, streamlining their formats and fitting them into predefined blue print structures,

In very early encyclopedias, even this higher level cooperation was largely absent because they were produced by single editors (like Cassiodorus, Honorius Inclusus or Vincent of Beauvais) who acted mainly as anthologists: by just selecting and aggregating existing texts. Even many eighteenth-century encyclopedias were the products of single compilers, such as Chambers' Cyclopedia of 1728 and the first edition of the Encyclopaedia Britannica, issued between 1768 and 1771. By the very end of the century, however, the task of "compiler" (who collects given texts) had metamorphosed into that of "editor" (who commands, directs, selects and modifies incoming contributions).

By contrast, digital media in general and the computer networks in particular provide many alternatives for more sophisticated forms of cooperation: ranging between completely open collaborations where everybody can participate (Wikipedia) to closed circles which restrict access by various means of digital control. For the first time in history, collaboration on the very micro level is also technically supported: by software tools of “collaborative writing” that enable groups of any size to work collectively on the same article or sentence and to influence even the most tiny details of spelling, grammar and punctuation.

On the most general level, it can be said that the Internet lends itself equally to two basically divergent modes of collective verbal communication:

On the one hand, it supports *discursive communication* by enabling users to express themselves personally, like in an oral discussion. Such exchanges result in “threads” consisting of all the posted messages filed in the order they have come in during time, without any mechanisms available to synthesize or systematize what has been written.[15] As seen in newsgroups, web fora, chats, blogs and other forms of online discourse, threaded online communication makes the achievement of consensus usually more difficult than face-to-face discussions because even in very large groups, everybody can articulate his personal opinion at any time, without referring to what has been communicated by others. Consequently, online discussion groups are more functional when an increase in complexity is sought (e. g. brain storming) than when the reduction of complexity is the goal (as in decision-directed deliberations) (Kerr/Hiltz 1982: 99f.; Gallupe and McKeen1990; Geser 2002). In addition, the diachronic structure makes it very hard for readers to harvest the yield of the discussion: especially in the case of newcomers who need much time to sift through all the accumulated materials.

On the other hand, online communication supports as well *synthetic document mode communications*[16], where the individual contributions become bricks or mortar of a larger collective production: regardless of the time of posting and the identity of its originators.
“Wikis” (invented by Ward Cunnigham 1995) can roughly be compared to naked concrete walls that can be painted by everybody:

[15] http://c2.com/cgi/wiki?ThreadMode
[16] http://c2.com/cgi/wiki?DocumentMode

“a website written with wiki software is the digital equivalent of a blank wall. Wiki users are handed cans of spray paint; it is the prerogative of the wiki user to adorn the wall with colorful murals or to deface it with racist epithets. In a wiki you can write over anyone else's work or create new content or even delete the whole damn thing. In principle you can do absolutely anything you want on a wiki because there is no editor or master to stop you." (Wilson 2006).

However, while paints on walls tend to stick irreversibly (or to leave traces when removed), entries in wikis can easily be erased by everybody who does not agree. Thus, a "memetic evolution" is started where the "fittest for survival" are those with which most participants do not disagree.
“This interface supports a higher level of consensus building because a user who disagrees with a statement can very easily delete it. In this sense, the text on wiki pages is content that has survived the critical eye of the community. (Viégas/Wattenberg/Dave 2004: 575),

However, technical reversibility is not enough: there has to be an incessant intensive activity from the part of users to correct any abusive entries within the shortest possible time. In the case of conventional printed encyclopedias, every maintenance activity can cease at them moment they are delivered and distributed. Wikipedias, however, remain only functional as long as very large number of editing users remain watchful and active. Otherwise, vandalizations –even if produced by very tiny user fractions – would remain uncorrected, so that the whole system would be continuously degraded.

While thread communication boosts subjective self-expression and individualization, wikis support processes of supraindividual community-building and objectification.
“Unlike blogs, they are not media for individual or small group expression with a conversation feature. They are intrinsically group communication media. In the case of Wikis, the conversation platform is anchored by a common text. From the perspective of facilitating the synthesis of positions and opinions, the presence of collaborative authorship of texts offers an additional degree of viscosity to the conversation, so that views “stick” to each other, must jostle for space, and accommodate each other. The output is more easily recognizable as a collective output than where the form of the conversation is more free-flowing exchange of competing views.” (Benkler 2006. 218).

While the thread mode is functional for facilitating communication *processes*, the document mode gives priority to their *results*: like in he case oft most conventional written texts whose final form provides no information about the antecedent processes that have led to their creation.
Thread mode communication is based on the “Heraclitean” (or Hegelian) premise that true knowledge emerges within a dialectic discourse between diverging communicators and remains open to dynamic change. Document mode productions rely on the “Platonic” assumption that true knowledge takes the supraindividual form of objectified “ideas” or “theories” whose eternal truth can finally be ascertained beyond all interpersonal disputes.

In contrast to the "dialectical" blogosphere, Wikipedian philosophy relies on the premise that true knowledge is produced in a continuous cumulative process of aggregating and synthesizing information, not in a process of dialectical discourse.
Consistent with this epistemology, Wikipedia participants are advised to focus on "constructive cooperation rather than adversarial strifes":
"The best way to resolve a dispute is to avoid it in the first place. Be respectful to others and their points of view. This means primarily: Do not simply revert changes in a dispute. When someone makes an edit you consider biased or inaccurate, improve the edit, rather than reverting it."[17]

In some cases, thread-mode productions are subsequently transformed into documents in order to systematize and simply the information and to ease its diffusion to additional participants: e. g. in the case of FAQ pages which inform newcomers shortly about the goals, values and norms that have been elaborated in the preceding discussions. In a similar fashion, the Wikipedia combines the two modes by paralleling each article page with a discussion page where dissensual aspects concerning the articles (e. g. conflictual views about scope or terminology) can be fought out. But the relationship is highly asymmetric, because the discussions are just an auxiliary tool for improving the quality of the article, while the article is not symmetrically seen as an input for fuelling the discussion.

In a functional perspective, Wikis can be considered the informational analogue to the assembly line in the industrial era. Like the latter, they provide the technological basis for aggregating an infinite number of modest individual performances into a highly complex end product that stands out as an object completely dissociated from all its individual co-producers.[18]

In no other sphere of text production, the shift from individual to collective authorship has been so fundamental than in the Wikipedia, where typical articles may well be the product of several hundred edits executed by a many dozens of collaborators.
The success of the Wikipedia even depends highly on this "fine grained modularity", because extensive participation can only be generated when even users with very modest skills, very little time and rather low work motivations see the opportunity to make valuable contributions (Benkler 2006: 100). This also has the effect that articles are mostly "endogenous creations" shaped by the cumulative influences of the different collaborators, so that exogenous dependencies (on earlier encyclopedias) are less pronounced than in the printing age where new encyclopedias were often very much influenced by their historical predecessors.[19]

While Wikis support convergent collectivist cooperation, they nevertheless do not provide intrinsic mechanisms for synthesis and systematization.
In printed encyclopedias where each entry is usually constructed by a single author, longer articles usually have a highly structured, coherent architecture (e. g. by pro-

[17] Wikipedia: Resolving Disputes http://en.wikipedia.org/wiki/Wikipedia:Resolving_disputes
[18] Following the metaphor step further, it could be mantained that In contrast to Fordist production systems, no individual "self-estrangement" (in the Marxian sense) is created, because
- the "means of production" are fully owned by the individual workers
- the products are "commonist" public domain goods accessible to everybody "according to his/her capacities and needs".

[19] See: Encyclopaedia Britannica 2004; entry "encyclopedia".

gressing from more general to more specific aspects). In the Wikipedia, however, articles are usually the product of many independent contributions of piecemeal parts, because nobody is given the responsibility to take care of the article as a whole. Thus IBM researchers have found that most collaborators simply add or cancel specific words, sentences or passages, while very few reorder paragraphs or reorganize the article as a whole Viégas et. al. (2004).
Like many other texts that are digitally created these days, many Wikipedia articles thus tend toward a low level of overall structuring and integration, because they are the product of a lose sequence of copy and past procedures spanning over a wide period of time.
“The over-all effect is jittery, the textual equivalent of a film shot with a handheld camera.” (Schiff 2006).

In many cases, the structure of most articles becomes irreversibly fixed at the time of their creation (or soon afterwards), so that the synthetic capacities (or incapacities) of their originators get a decisive weight.

5. Six Dimensions of WP growth and evolution

Analysed under various different perspectives, the WP shows a consistently accelerating pattern of growth.
Growth rates were particularly spectacular in 2006 where the total number of active Wikipedians as well as the number of edits, articles, words, images and internal linkings (by all WP's worldwide) has more than doubled (between Oct. 2005 and Oct 2006).
In the following, it is demonstrated that the WP unfolds in a sixdimensional space: all dimensions contributing to its quantitative size and ubiquity on the one hand and its qualitative significance on the other.

5.1 Worldwide multilingual diffusion

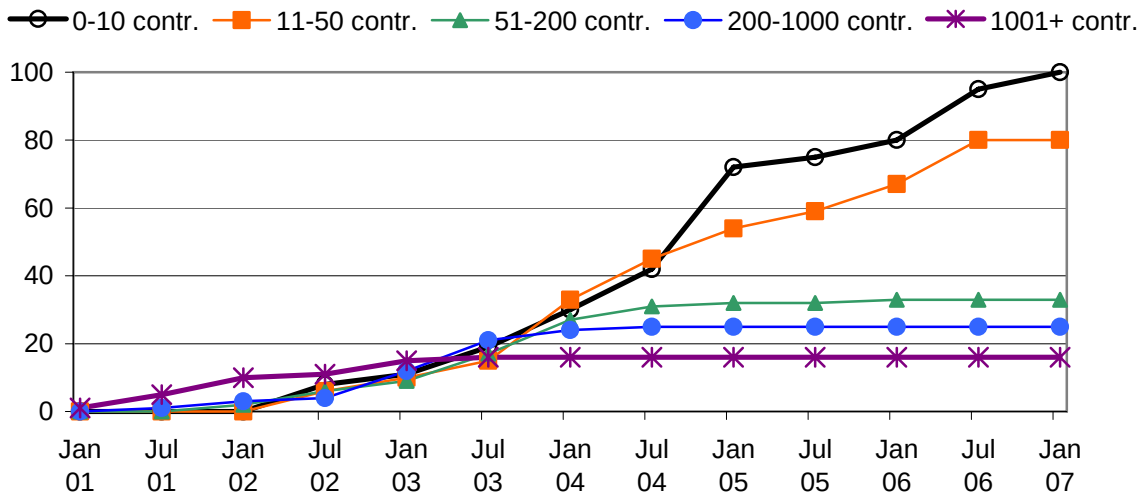
Since its inception in early 2001, the Wikipedia is a global project rapidly expanding to all major languages, ethnicities and geographic regions. In Dec 2006, the statistics page on “multilingual ranking” lists currently active Wikipedias in not less than 249 (!) languages: among them in dead idioms like Sanskrit and Latin as well as in almost all subnational languages of Europe that have little or no tradition of writing (like Alemannic, Ladino, Piedmontese, Sorbian and Greenlandic.[20]
However, only 176 of these had more than 100 articles, 110 more than 1000, 52 more than 10000 and 12 more than 100 000 entries.[21]

As seen from Figure 1, all the larger and middle-sized WP's drawing on more than 200 contributors were founded before the end of 2003, while the smaller versions covering minority languages have been steeply multiplying up to the present time.

[20] http://stats.wikimedia.org/EN/TablesDatabaseWords.htm
[21] http://en.wikipedia.org/wiki/Wikipedia:Multilingual_ranking_December_2006

While these versions diverge extremely in terms of size and growth (in accordance with the population carrying them), this rapid diffusion and ubiquity is most astonishing, because the question arises what makes the acceptance and active support of WP's is so independent of any specific cultural and societal conditions.

Figure 1: The rising number of Wikipedias in different languages 2001-2006: according to the number of active contributors*



** Individuals who have contributed more than 10 edits since their entrance*

Source: Erik Zachte's Wikipedia Statistics http://stats.wikimedia.org/EN/Sitemap.htm

In the course of 2006, the WP has achieved at least a rank among the 30 most frequented websites in most regions of the world. It enjoys a particularly high status in all German-speaking countries (Germany, Switzerland and Austria), where it occupies rank five or six. On the other hand, its popularity is least pronounced in some Eastern Asiatic countries: because of blockages (in the case of China) or strong competition by similar domestic sites (Table 1).[22]

Table 1: Position of Wikipedia in the rank order of all websites visited by the country's population (based on page views on Dec 15th 2006)[23]

Anglo-saxon	R	Western European	R	Eastern Europe	R	Latin America	R	Middle East	R	Far East	R
United K	11	Germany	4	Poland	11	Brazil	24	Egypt	31	Japan	13
USA	9	France	11	Russia	27	Peru	11	Iran	14	Taiwan	75
Canada	8	Spain	9	Romania	7	Venezuela	15	Saudi A.	46	S. Korea	>100
Australia	10	Sweden	11	Serbia	10	Argentina	16	Syria	28	China	>100
New Zeal	10	Greece	15	Ukraine	18	Bolivia	17	Oman	12	Vietnam	49

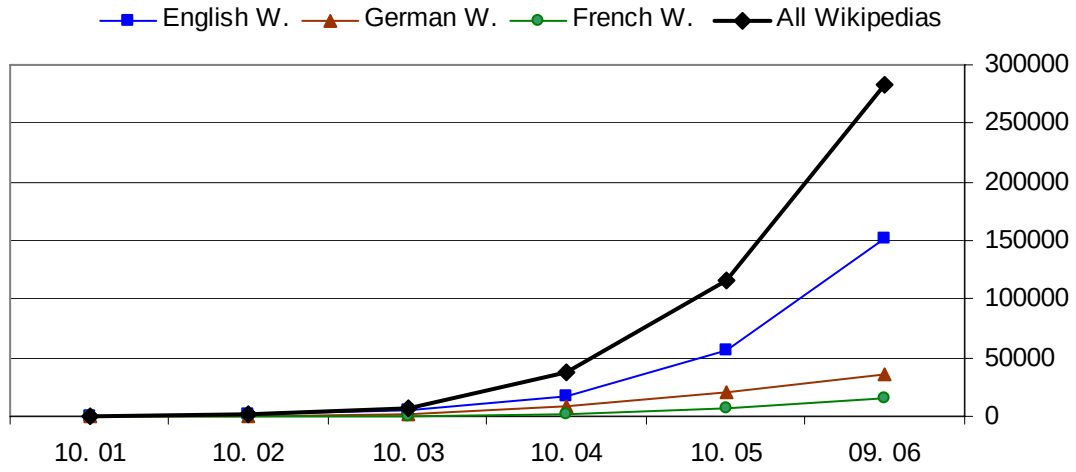
[22] In Taiwan, this competition stems particularly from the "Encyclopaedia of Taiwan" (http://taipedia.cca.gov.tw/) that includes also Wiki features since 2005. However, it is a higjly nationalistic endeavour because it covers exclusively domestic topics and editing access is restricted to citizens of Taiwan.

[23] http://en.wikipedia.org/wiki/Wikipedia:Awareness_statistics

5.2 Staff expansion

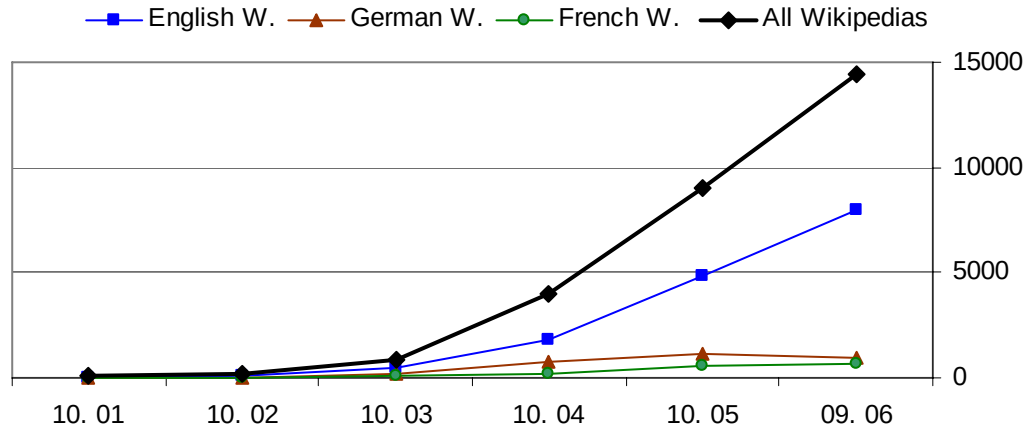
Figure 2 shows that the total number of active collaborators has developed rather moderately in the first four years, and then has multiplied about eightfold (from 38 000 to more than 300 000 from Oct 2004 to the present (Dec. 2006). Evidently, the English WP has been far better able to keep pace with these Worldwide developments than the two European WP's that have experienced a much smoother (while still perfectly continuous) expansion.

Figure 2: Wikipedia Development 2001-2006:Total number of collaborators (who have contributed at least 10 edits since their start)



Of course, part of this rise is attributable to the fact that the curve is accumulative: including many earlier users who have since discontinued their collaboration.
In fact, only about 25-30% of all these contributors belong the current "labor force" (= individuals who have made at least 6 edits in the current month). Interestingly, this percentage has remained rather stable during the last three years: except in the German case where the percentage of actives has continuously dwindled.

Figure 3: Wikipedia Development 2001-2006: Number of new collaborators per month



Source: Erik Zachte's Wikipedia Statistics http://stats.wikimedia.org/EN/Sitemap.htm

Looking at the expansion of the active user base, it becomes even more evident that the whole global WP system as well as the English WP is experiencing exponential growth, while the German and French Wikipedia are characterized by a much more moderate expansion (Figure 3).

As the growth data on the Zachte statistics are available for each month**,** it may be asked whether the evolutionary pattern can be adequately modelled by a not too complicated mathematical equation, from which short-range or even middle-range future predictions may be derived. Given that new contributors are constantly arriving while older ones are leaving, the cumulative historical number of active Wikipedians is likely to rise without limits. Therefore, a polynomial or exponential equation seems more fitting than a logistic curve that approaches an unsurpassable highest value.
By trying out different formulas, it is found that, the rising curve of total collaborators within the last two years can almost perfectly be fitted by a quadratic polynomial (in the German case) or a cubic equation (in the three other cases) (Table 2).

Table 2: Modelling the growth in the total number of contributors with cubic polynomial equations (covering the monthly figures from Oct 2004-Oct 2006).

	b1	b2	b3	F-value	R-Square
All WP's	0	-84.153	+2.078	7219.943	.999
English WP	0	-53.226	+1.231	5929.114	.998
German WP	-440.439	13.726	--	19476.727	.999
French WP	0	-.4.129	+.107	21.432.728	.999

By using these equations for future extrapolations, it can be predicted that within the next four years, the worldwide WP system as well as the English and French WP will experience a six- sevenfold increase in the base of collaborators, while the German version will expand much more smoothly (by a factor lower the four) (Table 3). Needless to say that such projections are highly speculative and most likely exaggerated, because they don't take into consideration that the "carrying capacities" of any linguistic population is limited and that the overall interest in the project may decline.

Table 3: Extrapolation of to number of Wikipedians (in 1000) between 2007 and 210 (= total contributors with more than 5 edits).

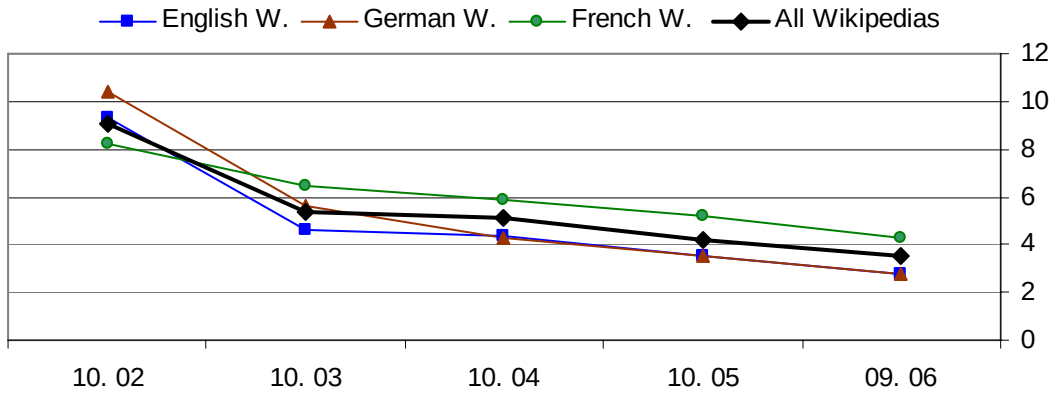
	Jan 07	**Jul 07**	**Jan 08**	**Jul 08**	**Jan 08**	**Jul 09**	**Jan 09**	**Jul 10**	**Jan 10**
All WP's	*339*	474	638	833	1062	1330	1636	1985	2379
English WP	*183*	260	354	466	599	753	930	1132	1361
German WP	*39*	49	60	72	84	98	113	128	145
French WP	*19*	26	34	44	57	71	87	105	125

As to be expected, the core of highly active individuals (with more than 100 edits per month) is much smaller and less subject to expansion. Unsurprisingly, its relative size was most prominent at the incipient stages of the project, and it seems to decline constantly in the course of ongoing expansion (Figure 4). Interestingly, the nucleus of

activist Wikipedians is significantly larger in France than in Germany or in the Anglo-Saxon countries.

While the number of worldwide (hyper)activists has not kept pace with the broader base of participants, it has nevertheless about doubled each single year: enlarging considerably the pool from which administrators, arbitrators, bureaucrats and other incumbents of with supervisory and integrative duties can be drawn.

Figure 4: Wikipedia Development 2002-2006: Percentage of highly active collaborators (> 100 edits per month)



Source: Erik Zachte's Wikipedia Statistics *http://stats.wikimedia.org/EN/Sitemap.htm*

Nevertheless, best curve fittings for the absolute rise on highly active collaborators are achieved when logistic (instead of polynomial) statistical equations are used in which the curves approach maximum values that are not much higher than the present figures. Thus, the equations predict that this "ruling elite" of administrators and other activists will only rise very modestly in the coming years: at most by ca. 20 percent.

Table 4: Modelling the growth in the number of highly active contributors (who posted more than 100 edits in the last month) with a logistic equation (covering all monthly figures from 2001 to Oct 2006).

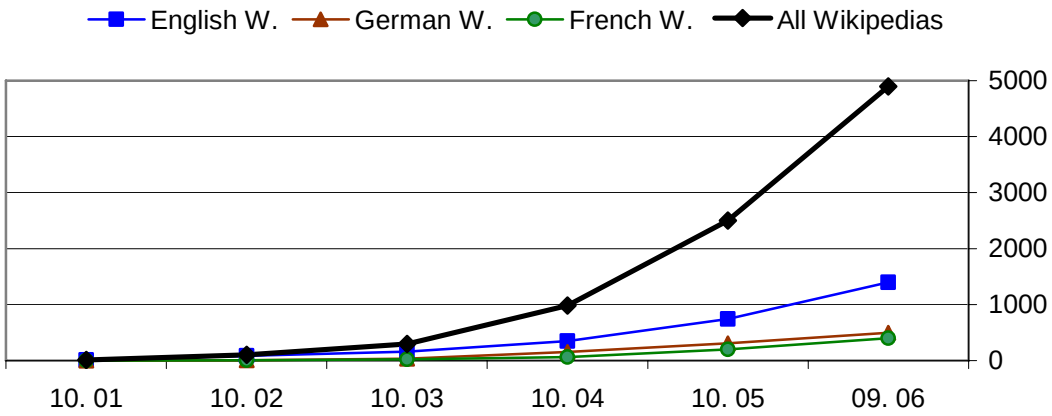
	current value	highest value	b1	F-value	R-Square
All WP's	*9921*	11000	*.843*	*6746.8*	*.990*
English WP	*4330*	5000	.858	5795.610	.989
German WP	*1013*	1200	.867	7835.303	.993
French WP	*680*	850	.878	15436.435	.997

5.3 Diversification

The multilingual proliferation of Wikipedias leads primarily to an expansion on the level of articles, because each collectivity contributes its own particular localities, personalities, cultural productions and historical events. Compared to the skyrocket-

ing trend on the global level, the growth of every single Wikipedia (even in English language) is rather modest (Figure 5).

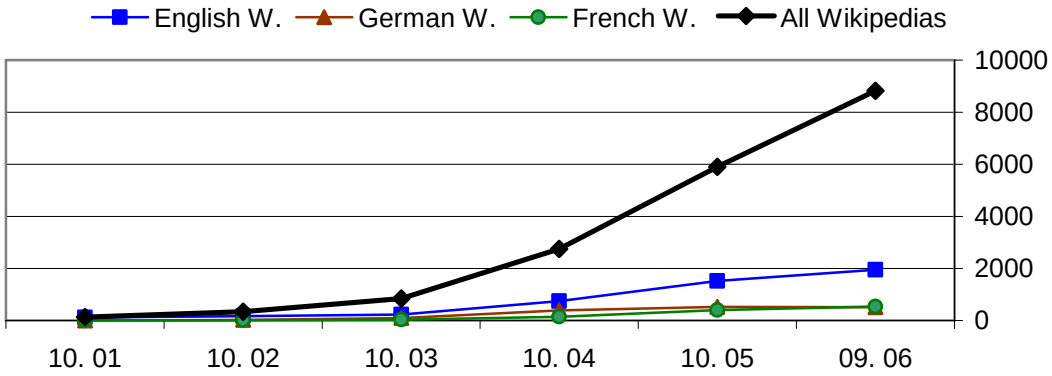
Figure 5: Wikipedia Development 2001-2006: Total number of articles



Source: Erik Zachte's Wikipedia Statistics *http://stats.wikimedia.org/EN/Sitemap.htm*

For checking whether expansion occurs in a linear or in an exponential fashion, it is analyzed how expansion rates change over time. As seen from Figure 6, the creation rates of new articles have increased very much on the world level, while the rate of the other encyclopedias have flattened out: indicating an almost linear pattern of growth.

Figure 6: Wikipedia Development 2001-2006: Average numbers of new articles per day

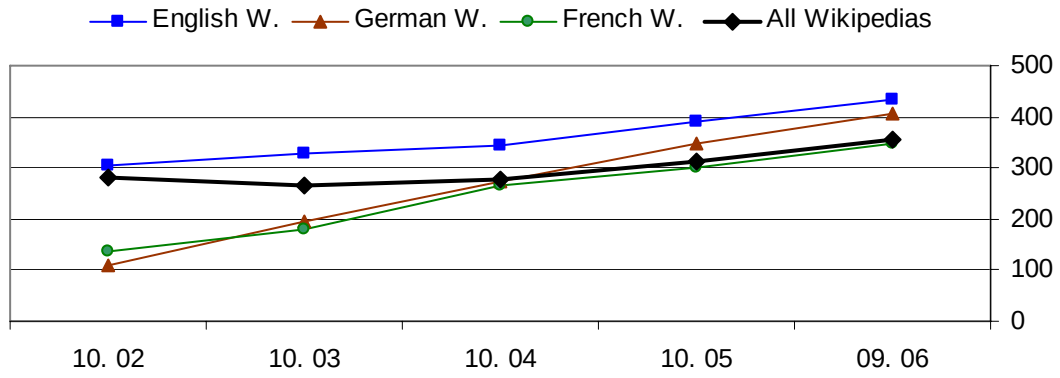


Source: Erik Zachte's Wikipedia Statistics *http://stats.wikimedia.org/EN/Sitemap.htm*

5.4 Elaboration

While the global WP system expands mainly by steep rises in the number of articles, the English, German and French versions give more weight to an increasing elaboration of their entries: by submitting them to many edits and enlarging their textual size. The German WP in particular seems to compensate its rather moderate additions of articles by considerable efforts in their internal elaboration: so that the average number of words per entry has increased fourfold (!) between 2002 and 2006 (Figure 7).

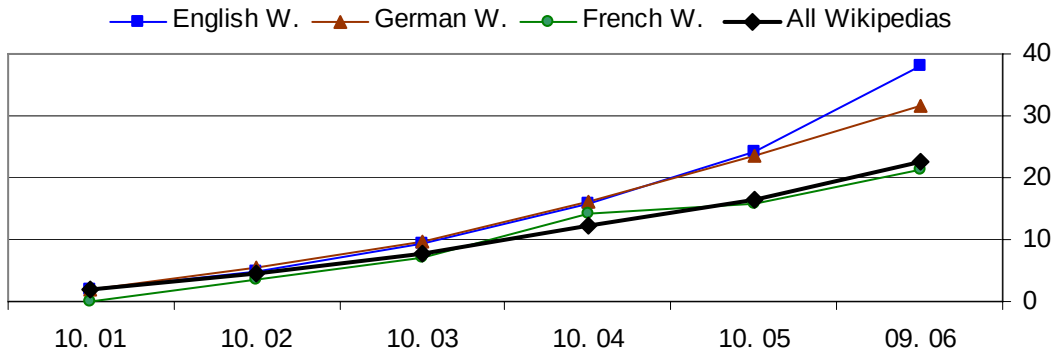
Figure 7: Wikipedia Development 2002-2006: Average number of words per article



Source: Erik Zachte's Wikipedia Statistics http://stats.wikimedia.org/EN/Sitemap.htm

Not unexpectedly, the German and English WP also excel in the number of edits per article (which seems to have gained much momentum recently in the Anglo-Saxon sphere) (Figure 8).

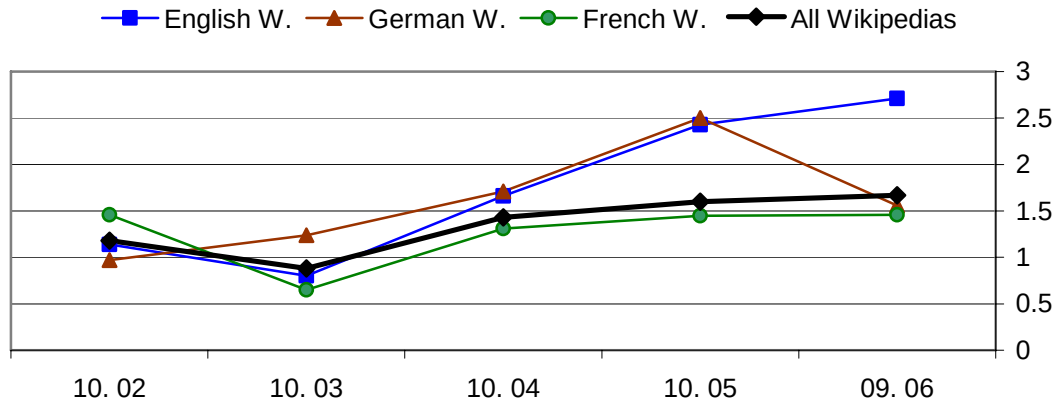
Figure 8: Wikipedia Development 2001-2006: Average cumulated edits per article



Source: Erik Zachte's Wikipedia Statistics http://stats.wikimedia.org/EN/Sitemap.htm

Figure 9 shows that updating frequencies have generally increased since Oct. 2003: with the exception of the most recent time interval where Germany which has experienced a decline.

Figure 9: Wikipedia Development 2001-2006: Average number of edits per month per article

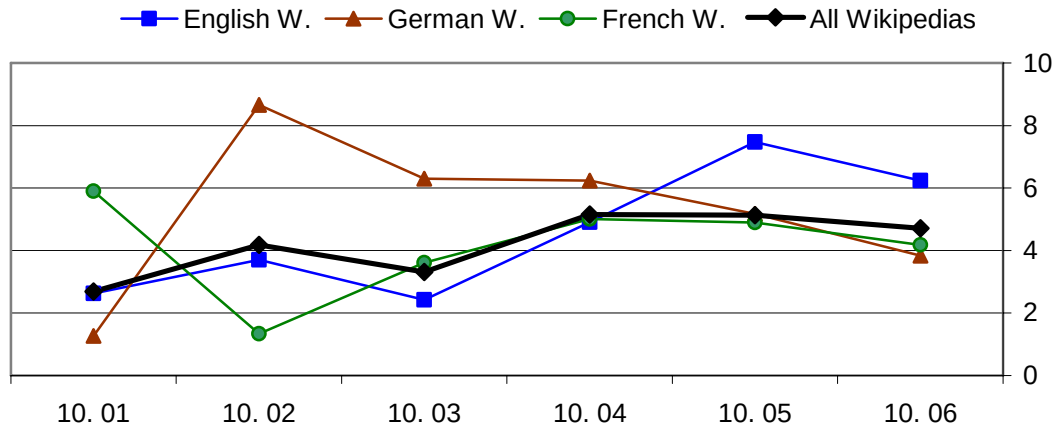


Source: Erik Zachte's Wikipedia Statistics *http://stats.wikimedia.org/EN/Sitemap.htm*

While many edits are directed at enlargements, others serve the purpose of correcting errors, eliminating vandalisms or substituting obsolescent by updated information. They are typically made by assiduous "wiki-clerks" more dedicated to formal than substantive aspects of encyclopedic work.

Empirically, such aspects of "diligence" can be grasped by relating the number of edits not to the number of articles, but to the volume of words.
As seen from Figure 10, the intensity of such "maintenance" activities have evidently decreased in the German WP, while they increased sharply (between 2003 and 2005) in the English version where nowadays, more than six edits (instead of four in the other cases) are on the average occurring monthly for every thousand words.

Figure 10: Wikipedia Development 2001-2006: Number of monthly edits per 1000 words



Source: Erik Zachte's Wikipedia Statistics *http://stats.wikimedia.org/EN/Sitemap.htm*

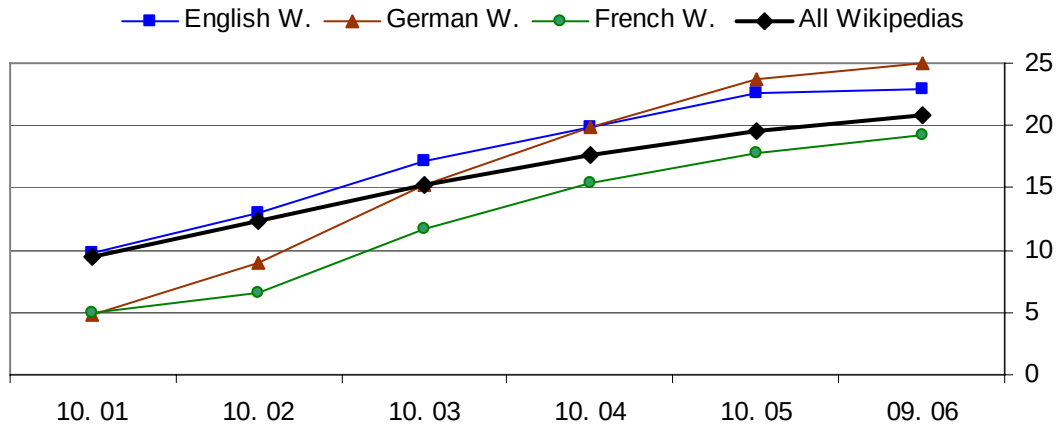
Considering all these findings. we may conclude that the expanding field of active participants (as seen in Figures 2,3,4) constitutes the basis for more speedy developments on the level of diversification, elaboration and diligence. This is particularly true for the English Wikipedia which currently exceeds the French and German sister

WP's by a fourfold creation rate of new articles (ca 60 000 per month) and by an almost twofold number of additional edits per article (about 2.7 per month).

5.5. Increases in internal cohesion

A fifth evolutionary dimension concerns the degree of *internal integration* which can be roughly operationalized as the number of interlinkages between the different pages.
As to be expected: there is a monotonic increase in the number of such hyperlinks in all Wikipedias, but despite the exponential increase in collaborators and edits, these increments seem to diminish recently, particularly in 2006. More than in other aspects, pronounced cultural divergences stand out here: with the German and English WP in the forefront, while the French WP lags considerably behind (Figure 11).
Given that the potential number of interlinkages increases exponentially with the rising number of articles, this decelerating growth implies that relative degree of connectedness between the articles is on a sharp decline.[24]

Figure 11: Wikipedia Development 2001-2006: Average number of internal links per article



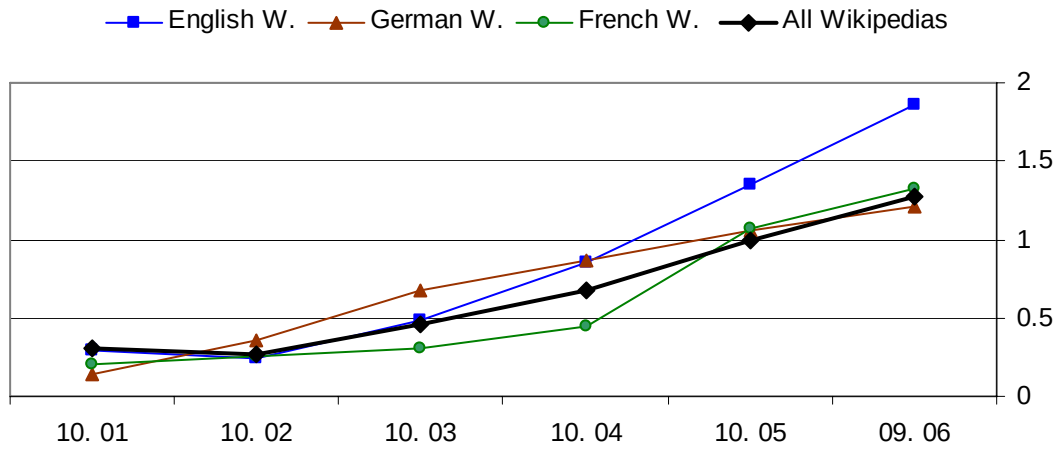
Source: Erik Zachte's Wikipedia Statistics http://stats.wikimedia.org/EN/Sitemap.htm

5.6. External Embedment

Finally, there is a sixth dimension of growth that refers to the external embedment of the WP within the WWW. This external integration" is also continuously increasing, but (in comparison with the internal interlinking) in a rather modest way.

[24] This concept of "connectness" is extensively discussed in Blau 1994.

Figure 12: Wikipedia Development 2001-2006: Average number of external links per article



Source: Erik Zachte's Wikipedia Statistics http://stats.wikimedia.org/EN/Sitemap.htm

Until the end of 2002, all Wikipedias have evidently followed an "isolationist" strategy by restricting the number of hyperlinks to other websites to almost a zero level. Since then, the mean number of such links has edged somewhat above one in the global averages as well as in the French and German WP, while approaching two in the Anglo-Saxon edition Figure 12).

These results prove convincingly that the Wikipedia clings to the printing age insofar as it tends to define itself still as a rather self-contained system offering the whole of human knowledge, rather than as a node within a Net in which for every single entry, a lot of other equivalent (and in some cases much richer) knowledge sources may be found.

6. On the potentials and limits of wiki-based open source encyclopedias: some preliminary conclusions after six years of experience

6.1 Free self-recruitment of collaborators

Conventional encyclopedias usually base recruitment on previously achieved status characteristics that are interpreted as valid indicators of expertise: e. g. by inviting only personalities with professoral or doctoral degrees. In other cases, recruitment is expanded to individuals enjoying an informally achieved public reputation (e. g. intellectuals) or with status positions in non-educational institutions (e.g. high ranking politicians or successful entrepreneurs). Of course, such recruitment patterns help to keep the resulting knowledge canon within the limits of institutionally established elitist culture. There was always a strong bias against the inclusion of “indigenous” knowledge originating in folk cultures or esoteric circles. Thus, magic and astrology had no place in European encyclopedias since the 12th century.

In modern societies, such *ex ante* criteria are of limited value for various reasons

1) high scholarly reputation and status achievement is not primarily based on the possession of existing, but on the production of new knowledge. Thus, highly innovative researchers may have rather limited knowledge about the broader structure and historical development of their specialized topics.

2) Educational status characteristics are always based on past achievements; so that they may not be consistent with present qualifications (e.g. in cases where a scholar is no longer up to date because of illness or advanced age).

3) There may be important spheres of knowledge which are not in the reach of any formally educated scholars, because their acquisition occurs mainly by self-education or by accumulating practical experience. This is particularly true for most practical knowledge (e. g. used in the production of goods and services) that has been so prominent in Diderots Encyclopaedia. And it is even more true for any spheres of “subcultural” or “indigenous” knowledge controlled and transmitted informally within special segments of the population: e. g. knowledge about heavy metal music bands or computer games, about sectarian religious belief systems or anthroposophic medical treatments.

4) The knowledge about many subjects has become so complex and multifaceted that it is distributed among many individuals with different specialities and experiences. Thus, no single person will be capable of producing comprehensive articles on “London” “Goethe” or “Renaissance” that treat all important aspects of the topic on the same scholarly level.
“I think the day will come in the future when people will look at an article in Britannica and say, `This was written by one person and reviewed by two or three more? That's not sufficient. I need an article that's been reviewed by hundreds of people.” (Jimbo Wales).[25]

In short: widening the pool of potential collaborators, evaluators and correctors is indispensable when knowledge is too complex to be controlled by any “expertocratic elite”. For instance, systems of “peer review” fail when it is not possible to select ex ante the people most capable of evaluating a specific contribution – e g. because the contribution refers to something so new or so specialized that no “reputable experts” exist.

By starting without any advance knowledge about who possesses what kind of knowledge about what topic, the Wikipedia is compatible with a highly complex, intransparent society where new areas of previously inexistent knowledge areas (e. g. about new technological or cultural phenomena) are constantly arising, and where an unknown manifold of knowledgeable individuals have to be taken into account.

According to an internal WP page, an avid interest in Wikipedia has been known to *“affect primarily computer programmers, academics, graduate students, game show contestants, people suffering from Asperger’s Syndrome, people living in the*

[25] cited in: Greenstein/Devereux 2006

suburbs, news junkies, the unemployed, the soon-to-be unemployed and, in general, people with multiple interests and good memories..”[26]

The very lack of recruitment procedures has the consequence that the composition of Wikipedia collaborators is rather homogeneous, because the general “digital divides” various population segments are not only reproduced, but even amplified:

“The average Wikipedian on English Wikipedia (1) is male, (2) is technically-inclined, (3) is formally educated, (4) speaks English to an extent, (5) is White, (6) is aged 15-49, (7) is from a predominantly Christian country, (8) is from an industrialized nation, and (9) is more likely to be employed in intellectual pursuits than in practical skills or physical labor. There are many college professors and computer programmers editing Wikipedia, but very few auto mechanics, fire-fighters, plumbers, miners, or electricians.”[27]

By giving everybody the capacity to edit and change existing pages, all Wikis are evidently based on the premise that
1) the majority of participators makes constructive rather than destructive contributions;
2) contributors believe that this premise is true: because otherwise, their motivation would be destroyed.

On the *motivational level,* this implies that most participators are driven by positive intentions, not by drives of intentional lying or vandalism.
In the case of Wikipedia, this premise is stated in the principle of “good faith”:
“To assume good faith is a fundamental principle on Wikipedia. As we allow anyone to edit, it follows that we assume that most people who work on the project are trying to help it, not hurt it. If this weren't true, a project like Wikipedia would be doomed from the beginning.[28]

On the *skill level,* this presupposes that any information provided is more likely to stem from knowledgeable than from uninformed individuals, and that more informed individuals have better chances to have their contributions accepted. This again implies that most people have a realistic self-assessment about their own knowledge – so that they accept corrections when they are originating from a more competent side.

“….what stands out compared to previous modes of production is the self-selection aspect. Production is granular and modular, and only the individuals themselves know exactly if their exact mix of expertise fits the problem at hand. We have autonomous selection instead of heteronomous selection.“ (Bauwens 2005).

In fact, 51% of benevolent and competent participators would be sufficient to set a cumulative process in motion which would lead to a gradual overall improvement of the Wiki because at least in the longer run, “good content” is more likely to be posted and to be maintained, while “bad content” is more likely to be corrected or weeded

[26] http://en.wikipedia.org/wiki/Wikipedia:Wikipediholic
[27] http://en.wikipedia.org/wiki/Wikipedia:WikiProject_Countering_systemic_bias
[28] http://en.wikipedia.org/wiki/WP:AGF

out. Of course, such low percentages would result in very slow improvement processes: with the consequence that at each point of time, many errors would be uncorrected, and many less-visited hoax sites or vandalised articles would not be eliminated. Consequently, the assumption to produce highly reliable knowledge bases approaching those of professional encyclopedias is based on the assumption that the percentages of competent and benevolent contributors (as well as the correlations between knowledge level and influential participation) are rather high.

The Wikipedia certainly contributes to a levelling between experts and laymen as knowledge providers, because the names, status positions and qualifications of contributors are not visibly marked. No assertion is accepted as “true” only because it stems from a Wise Old Man who is highly respected because many of his statements have proven to be true in the past.
As knowledge is so much dissociated from personal communicators, it has to be evaluated on the basis of its intrinsic merits, the empirical sources on which it relies as well as its consistency with other facts or theoretical constructions.
"Wikipedia's articles on the British peerage system - clearheaded explanations of dukes, viscounts, and other titles of nobility - are largely the work of a user known as Lord Emsworth. A few of Emsworth's pieces on kings and queens of England have been honored as Wikipedia's Featured Article of the Day. It turns out that Lord Emsworth claims to be a 16-year-old living in South Brunswick, New Jersey. On Wikipedia, nobody has to know you're a sophomore." (Pink 2005).

6.2 Extensive and efficient exploitation of intrinsic motivations

Since the Renaissance, Western societies have focussed very much on culture as an arena of individual productions (text, pictures, music compositions etc.) neatly attributable to single authors. More than that, every new work should stand out from others by “originality”: showing a singularity of features not realized anywhere in the past and not repeatable in the future. Of course, strategies of individual attribution may be functional for boosting individual motivations: a major reason why they are also widespread in the academic sciences: serving as a driving force for individual careers and reputation
As this "romantic individualism" is inimical to all forms of labour division, it has also undermined for centuries all encyclopedic endeavours, because such projects have to be based on a collectivism that doesn't leave much space for individual self-aggrandizement.

Thus, the question “why does anybody participate” was legitimate during the whole history of encyclopedias, because collaboration in such projects was seldom an attractive way to gain individual rewards. Typically, the articles delivered were not paid and did not contribute much to personal reputation, because the name of authors remained concealed (or were indicated only by initials, like in the newer editions of the Encylcopedia Britannica).
Long before the Wikipedia, therefore, co-authors have been primarily stimulated by other motives than by boosting their personal reputation: e. g. by the extrinsic satisfaction to belong to a specially selected, extremely prestigious scholarly elite, or by

the intrinsic satisfaction to co-define the “official” canon of knowledge of a given epoch or society.

For motivational psychology, therefore, the Wikipedia does not pose radically new problems, because by studying any kind of voluntary behavior, the social science have always done wise to assume that “homo sociologicus” (in contrast to (homo oeconomicus) is driven by a multitude of different motivations:
"On (the) level of individual satisfaction, there are a number of varying themes. Firstly, as one participant says, it gives him an outlet for his writing ; another likes to feel important, and consequently is more involved in a sister project, Wikibooks, where there are less people; and another likes to be able to educate other people about what he knows and his country's history. (Cormaggio 2006).

Compared to traditional paper publication projects, the Wikipedia has enhanced capacities to harvest and aggregate such diverse motivational resources, and to channel them efficiently into constructive cooperative endeavours.

1) Many collaborators of moderate and low levels of motivations may be won just because the thresholds to participation and the costs of collaboration are so low. Thus, everybody with a hooked up PC can log in and edit pages anytime at any place on the planet earth. Because no membership role with formalized duties has to be adopted, participants remain free to decide on the modes, ways and intensities of present and future collaborations; and contributions can be so “fine-grained” (e. g. by just adding a single figure or correcting spelling mistakes) that almost anybody can feel self-confident enough to add at least some modest improvements.
Again, it is not unjustified to compare the Wiki-technology with the assembly line: both share the principle of breaking down production processes into small independent modules, so that lower skill levels are sufficient to make valuable contributions:
“‘Modularity’ is a property of a project that describes the extent to which it can be broken down into smaller components, or modules, that can be independently produced before they are assembled into a whole. If modules are independent, individual contributors can choose what and when to contribute independently of each other. This maximizes their autonomy and flexibility to define the nature, extent, and timing of their participation in the project. The number of people who can, in principle, participate in a project is therefore inversely related to the size of the smallest scale contribution necessary to produce a usable module.” (Benkler 2006: 112).

This also explains why some sister projects like Workbooks have not taken off: because the minimal threshold that had to be reached (e. g. to contribute useful textbook chapters) has been much too high (Benkler 2006: 101).

2) The “law of big numbers” teaches that to the degree you increase the number of participants, the more likely it becomes that among them, you will also have individuals with a very wide variety of (also quite rare) characteristics, skills and motivations.
"These motivations may be personal: self–satisfaction, self–efficacy, intrinsic drive to acquire knowledge. These motivations may also be social in nature: Passion and desire to take part in the production of a collective good, a need for belonging, a need to support a specific community. Motivations may also be ethical, or they may be related to reputation, which may become a source of authority, a font of fame and a voucher to play in the labour market." (Ciffolilli 2003).

Thus, very few individuals may find deep satisfaction in correcting the spelling and punctuation of other peoples texts, but in a population of 800 million Internet users, they may still run into thousands; and whoever succeeds in mobilizing them can generate a volume of voluntary work worth millions of Dollars if it would have to be bought on the labor market. Evidently, the success of the Wikipedia is based on such effective filterings. For instance, hundreds of “police constables” are patrolling for overseeing and correcting various cases of abusive behavior; a silent brigade of “janitor-minded” individuals is constantly active to clean up after vandalizations; talented “mediators” feel urged to intervene in order to moderate heated edit wars; and fussy “clerks” with a bureaucratic mentality are highly useful to correct even very tiny errors in biographies or statistical tables.

3) Given its constantly rising status as a primary reference site and its spectacular impact on global knowledge culture, the Wikipedia is attractive for anybody who draws satisfaction from being part of such a big and influential project – even if his contribution is minor and insecure. Thus, a collaborator confesses that *“knowing that an article will instantly become a published part of a worldwide reference is an intoxicating enticement.” (Wilson 2006);* and another compares himself with somebody working on the most sacred texts of human society:
“Recently, I decided to do my part in contributing to the ocean of information at Wikipedia, and I must say that the first time I actually edited a page and saw my changes instantly take place, available for everyone to see, I felt like I had written part of the constitution or even a verse in the Bible itself. Anyway, it felt great to add to the largest open encyclopedia in the world, even if my only major contributions were about fairly obscure basketball players.” (McNally 2006).

Some contributors face for the first time the opportunity to make proselytes by displaying the knowledge they have privately accumulated in their hobby activities to a wider public. Thus, a Madison-based software engineer named Sean Lamb has derives personal satisfaction from contributing articles about American railroad history: a very specialized topic not likely to be treated by many others. (Patrick 2005).

On the other hand, however, collaborators may feel demotivated by the perspective that their efforts may be in vain because their contributions are deeply modified or even eliminated completely by subsequent editors.
"One interesting possible barrier of entry to active participation in a wiki is what I call the ‘wiki editing dichotomy’. You have to be proud enough to believe what you are contributing is generally worthwhile to others (or at least worth your effort), but you also have to be humble enough to understand that others can improve it. I don’t know of many other collaborative media that requires both pride and humility." (Allen 2005)

This levelling implies that even highest reputable professionals find themselves in a fierce competition with colleagues as well as with outsiders who may have gained heir knowledge by extraprofessional (e. g. autodidactic) channels.

Following rational choice theory, we might assume that higher level experts are strongly *dis*couraged to participate, because they gain much less acceptance than

when they use more conventional channels[29]; while lay persons are strongly *en*couraged because for them, wikis may provide the only arena where they can successfully display their knowledge and their ideas.[30]

6.3 Low needs for capital and organization

Printed encyclopedias are highly ambitious endeavours needing high investments of resources and long-term editing commitments. Books in general need much care and effort in order to avoid errors irreversibly fixed on printed paper. In the case of encyclopedias, errors are particularly harmful because they may be copied and diffused throughout society to the degree that the work is used as a reference. Like in the case of telephone books, the reputation of an encyclopedia depends fully on its perfect reliability, and intensive checks and controls are necessary for keeping up to such standards.
Usually, only a few potent societal actors or collectivities are capable of engaging in such a project: e. g. monarchs, rich elite members, foundations or governmental institutions. As a consequence, encyclopedias tend to be born and raised at the very center of societies. Very often, they have been created for the purpose of expressing the tradition and thinking of a societal elite or of symbolizing a national culture. Thus, most of the classic Chinese encyclopedias owe their existence to the patronage of imperial rulers; the emperor Constantine VII of the Eastern Roman Empire (913-959) was responsible for a series of encyclopedias, and king Alfonso X of Spain (1252-1284) sponsored the “Grande e general estoria” (“Great and General History”).
Only rarely we also find more encyclopedias originating more at the periphery of society: like the famous French “encyclopédie” of Denis Diderot that was emerging within the enlightenment movement that opposed the reigning religious institutions and monarchical regime.

Since the 19th century, such independent endeavours have been less frequent for various reasons: e.g. because the volume of relevant knowledge has expanded, the demands for comprehensiveness and reliability have risen, and the costs connected with new printing technologies and distribution procedures have increased.
Especially the 20th century was rich in “governmental encyclopedias” aiming to provide a most impressive picture of national culture and national achievements (e. g. the enciclopedia Italiana, the Soviet “Granat” encyclopedia or the Enciklopedija Jugoslavije (first published 1955–71). This explains why in many cases, not only the most educated scholars, but the most powerful personalities of the respective time (e. g. Lenin and Mussolini) have made significant contributions.

Because of high costs, conventional Encyclopedias have a high expressive value as status symbols. Whenever an EB or a Brockhaus is found on a shelf in a living room or in a private library, a double message is sent out: that the owner has (had) enough money to buy it and enough education to make use of it (while everybody knows and accepts that it is rather rarely consulted).

[29] In fact, while large numbers of active collaborators identify themselves as graduate students, rather few of them iderntify as professors (Read 2006).
[30] http://www.theregister.co.uk/2005/10/24/wikipedia_letters/

Seen in this wider historical perspective, digital encyclopedias help to regain the independence from governmental power centers, economic enterprises and other societal institutions: an independence that was quite remarkable between the 16th and 18th century but was later lost in the course of rising nationalism and industrialization.

Labour costs are very low because so much motivation for unpaid voluntary collaboration can be tapped (see 4.2); and *capital costs* are negligible because like other Web projects, the Wikipedia thrives on hardware and software resources that are already fully available for other reasons: individually owned PC's already acquired for various private or professional purposes, and excess capacities of networks that have been built for telephone transmission or other commercial purposes.
For several reasons, populations in rich modern societies have high "discretionary resources" (in terms of free time, money or skills) that are disposable for various new purposes because they are not committed to work or family duties (McCarthy/Zald 1977; 1987). There are many potential providers of such resources: e. g. temporarily jobless or partially employed people, students, housewives or retirees. In addition, changes in modern lifestyle contribute to a growing "decommitment" of resources; many adults live alone or with few or no children, many are rather isolated immigrants far away from relatives and friends, and increasing numbers do not participate in voluntary associations or political parties, so that they spend most of their free time at home (Putnam 2000).
The Internet empowers such individuals further by providing unlimited possibilities for data transfer and communication and by harnessing them to a large variety of new purposes: e. g. by providing interactive online networks where everybody has a chance to feed in his or her contributions.

A major decline in labour costs is caused by the demise of many more "ritualistic" activities that make the finalization of printed works so cumbersome. For instance, much work is dedicated to "streamlining" and "homogenizing": e. g. by implementing standardized criteria of typing, grammar, orthography, titles, footnotes, bibliographies etc. While such standardizations do not contribute much to readability, they seem nevertheless indispensable for aesthetic or conventional reasons.
In the case of computerized hypertexts, there is much more tolerance for inhomogeneities: maybe because each page is seen in isolation, so that inconsistencies across pages become less visible than by skimming a book As a consequence, much editorial overhead costs can be saved. On the other hand, this implies that it is highly difficult to transform electronic encyclopedias into manuscript ready for publication. Such high prospective costs for "streamlining" were a major reason why the ambitious book edition of the German Wikipedia has recurrently failed.[31]

Among many other consequences, the decline in production and distribution costs implies that conventional limits of growth and accessibility are completely removed.

1) In the printing age, there were always harsh limits on the total size of encyclopedias, and thus indirectly on the volume dedicated to various articles or systematic divisions. (For instance, the total text volume of the EB and Brockhaus has remained on the same level since about 150 years!).

[31] "Erneut scheitert Buchprojekt mit Wikipedia" Sueddeutsche Zeitung 23. 12. 2006. http://www.sueddeutsche.de/computer/artikel/152/84068/article.html

Therefore, editors were always required to exert selection: thus inevitably expressing their own personal preferences about what shall be included and what deserves a shorter or more comprehensive treatment. This selectivity was highest in the one-volume pocket encyclopedias which always tended to be heavily shaped by the personality of a single author.
However, the larger and the more anonymous the public, the more pressing the need to broaden the scope in order to satisfy all the different interests. But as the overall space was limited, this resulted in an ever more atomized knowledge structure with a declining average size of entries[32].

By contrast, digital encyclopedias can expand without such pressures toward atomization: by just adding new and expanding additional articles at the same time.

Because of its unlimited potentials for growth and diversification, the Wikipedia fares far better than printed works in exploiting the "Long Tail" (Anderson 2004): the large number of highly specialized information needs articulated by very many infrequent users.
In fact, the Wikipedia builds its reputation heavily on the whole sum of quite unpopular, rarely consulted articles, while classical encyclopedias base it predominantly on a smaller number of more frequently used entries.[33]
This implies that the Wikipedia is attracting a very large and highly diverse public, similar to Amazon which lives from selling few copies of very many different books. On the other hand, the lack of physical resources makes any kind of filterings and shortenings difficult to legitimate: because they cannot be justified by technical or economic arguments: so that more ideological, philosophical or scientific reasons have to be provided (arguments likely to be quite dissensual over cultures, user groups and historical time).

2) In the age of printing, there was a rigid trade-off between volume and accessibility: Only very small encyclopedias were cheap enough to get a large distribution and light enough to be carried along. More user-oriented encylopedias including "everything" were not only expensive, but so clumsy that their fate was to remain on rarely visited bookshelves in libraries or other rooms far apart from practical activities and "real" human life.
Digital encylopedias can grow unlimitedly without losing accessibility caused high acquisition costs, clumsiness or other material factors. Soon, they will be fully available for portable handheld devices or in audio form, so that users have all information at their fingertips at the very moments they need them (e. g. within a meeting or while driving a car).

3) Traditional encyclopedias could only be produced by sizable and rather wealthy collectivities; preferably by populations organized in nation states with governmental agencies and large editing houses that could act as initiators and sponsors.
Wikipedias, by contrast, can flower everywhere, because even tiniest groups have enough potential to set such online processes of knowledge accumulation into motion. In fact, there is a global diffusion of Wiki technology, protocols and software, because this knowledge is so formalized and decontextualized that it can be copied, transmitted and implemented everywhere, regardless of any socio-cultural and lin-

[32] Encyclopaedia Britannica 2004. article on "Encyclopedia".
[33] http://en.wikipedia.org/wiki/The_Long_Tail

guistic conditions. Thus, Wikipedia clones have rapidly sprouted in about 250 languages, even if many of them are still "empty shells" waiting to be brought to life by active users.

Given that all contributions to the Wikipedia belong to the public domain, anybody disagreeing with the current encyclopedia is allowed to initiate a new encylopedia by simply eliminating all the unwelcome entries and retaining all the rest. Such "forking" has given birth to the "Enciclopedia Libre Universal en Español (split already in 2002).[34], and to the foundation of Wikinfo[35] in 2003 (an alternative project rejecting the rigid "neutrality" principles of the Wikipedia)**.**

4) Given their large and long-term need for subsidies, traditional encyclopedias could usually gain only limited autonomy from their mighty economic and political sponsors; and given their linkages to academic elites, they had no choice than to give priority to institutionally established knowledge cultures.
In comparison, the Wikipedia has hitherto remained remarkably independent from economic corporations as well as from governmental agencies and educational institutions. The economic autonomy is dramatically highlighted by the complete lack of advertisements and the very low operational budget that is mainly covered by a multitude of rather small individual donations. While "blind spots" and censuring endeavours certainly exist, they seem to be associated more with idiosyncratic personal sensitivities than with larger-scale institutional interests and strategies. While this allround autonomy is certainly a highly valuable asset, it is also a source of risks because it makes the WP "underdetermined" (Berinstein 2006) and therefore vulnerable to any kind of intrusions, assaults and even "kidnappings" by any highly active particularistic groups.

6.4 Multicultural segmentation

By encouraging the most knowledgeable individuals of each culture to work on their own encyclopedic project, a multi-domestic and multicultural repository of human knowledge in almost all written languages may come into existence.
In some cases, Wikipedias may even offer a "last secure haven" for a language on the brink of extinction, or they may upgrade indigenous languages (that hitherto have been spoken only orally) to the level of writing (e. g. Alemannic, Sardu, Ladino or "Plattdütsch"). Even artificial survival (or revival) resorts for dead languages may be created: e. g. the rather lively "Vicipedia" in classical Latin that has 1100 entries (in Jan 2007) and is progressing with about 300 updates per day.

Given a median value of about 800 articles. many WP's are very small – and will remain so – because they represent marginal linguistic communities with only a few hundred (or thousand) speakers.

As they have no potential to cover contemporary knowledge, their function is more expressive than instrumental: making the minority language visible to its population

[34] http://enciclopedia.us.es/index.php/Enciclopedia_Libre_Universal_en_Espa%F1ol
[35] http://www.wikinfo.org/wiki.php?

of speakers as well as to a worldwide public, demonstrating that the language has still active promotors who want to give it a place within the sphere of written culture.
In fact, constructing an encyclopedia means: putting a language under a very hard test: stretching its verbal expression capacities to the utmost by conceptualizing and describing an unlimited number of different topics, by importing and assimilating a an ever growing manifold of terms from other languages, and by creating neologisms for keeping pace with new developments and events.

At the same time, a focus of collective identity is created which may be particularly important when the speakers are not living together in the same geographical location, but are dispersed in diaspora where they have no opportunity to use their mother tongue. In some cases, contributors seem to consider the WP as a vehicle for transporting and reinforcing traditional folkways and other elements of traditional culture.[36]

Given the small number of speakers, such minority WP’s have to be built on a very small group of collaborators who tend to shape it strongly according to their subjective preferences and views.
In many cases, they invest their limited energies into creating blueprint structures of many different “stubs” (e. g. about each local community): leaving it to others to insert corresponding content.

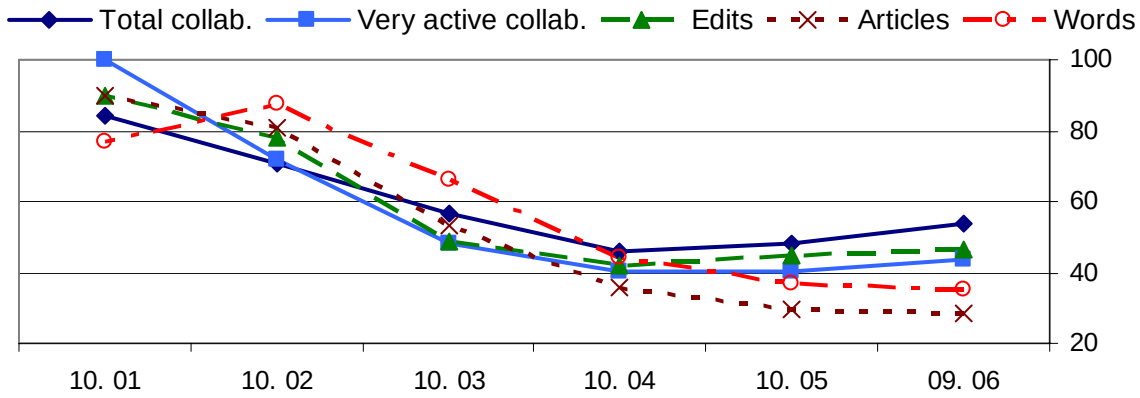
On the special leadership role of the English WP

How will the relationship between the few "big" and the numerous small WP's develop in the future?
On the one hand, the rise of so manly smaller WP's in practically all existing languages has the effect that the originally dominant WP's retreat into a more modest relative position.
In the case of the English WP, however, this status loss is attenuated (or even neutralized) by the fact that by representing the hegemonic Western knowledge culture in the most dominant of all current languages, it occupies a singular reference position of global reach - not to be compared by other Western WP's that are more exclusively affiliated with "their" national or linguistic culture.

In this respect, the English WP may "inherit" at least partially the supreme status of the Encyclopedia Britannica which is - and always was - able to attract a worldwide public of readers as well as a globally dispersed collectivity of first-rank contributors.
This singular significance may explain why since 2004, its share of collaborators does not diminish in the same way as its percentage in articles and words, but has stabilized on an astonishingly high level: well above 40%. Especially the share of total collaborators has lately again been on the rise, so that at the end of 2006, it has almost regained the level of 2003.

[36] In the corsic WP, for instance, many entries contain popular proverbs (e. g. the pages dedicated to each month).

Figure 13: Wikipedia development 2001-2006: The percentage share of the English Wikipedia among all Wikipedias: in terms of collaborators, edits, articles and words.



Source: Erik Zachte's Wikipedia Statistics http://stats.wikimedia.org/EN/Sitemap.htm

As a consequence of this outstanding hegemonic role, the English WP has a particular responsibility in transmitting accurate, complete and consistent knowledge, because it serves as an authoritative knowledge provider for so many users, including the active contributors of many lower-scale Wikipedias all over the globe. Therefore, it will come more under particular pressure to install far-reaching mechanisms of internal control.
Secondly, it is highly probable that the English WP becomes an arena for any kind of global controversies on scientific, ideological, philosophical or religious levels, including the imminent clash between Western and Islamic culture.

6.5 Flexible polymorphic organization

Conventional encyclopedias are produced under the condition that many parameters are rather irreversibly fixed in advance. For instance, the realm of knowledge to be included has to be circumscribed, lists of experts to be called for contribution have to be compiled, and the organization of the whole enterprise (in terms of roles, competences, norms, procedures, deadlines etc.) must be defined.
In many cases, there additional exogenous constraints: the publication has to insert itself into the tradition of antecedent editions of the same product (e. g. Brockhaus or EB), it has to fit into the larger edition program of the publishing house, and expectations of potent sponsors may have to be satisfied.
As a consequence, such printing projects are likely to be overdetermined: far from being flexible for adapting to environmental needs, the personal and organizational parameters may even be in contradiction to the stated mission and the concrete functional needs.

Wiki encyclopedias do not require such antecedent decisions. They may start “from the scrap” as very embryonic projects without any explicit planning and design. Within a process of unplanned incremental growth and “open-ended evolution”, it will be determined ex post what contents are considered, who participates in what way and what kind of organizational procedures and structures may develop as a result of

manifold smaller decisions and adaptations. Of course such projects are likely to be "underdetermined" because on the one hand, structures are flexible enough to adapt to task needs an environmental conditions; on the other hand, such conditions are themselves not "given", but subject to changing collective decisions.
Evidently, Wikipedias are better adapted to highly complex and dynamic societies where the parameters needed for organization building are not known ex ante, because

- the world of relevant knowledge is so rich and so volatile that it cannot be represented in a blueprint model;
- the distribution of knowledge among members of society is not known, and
- the activities needed for selecting, formulating and synthesizing encyclopedic contents are so manifold that they cannot be reduced to formalized procedures.

Apart from its anchoring in the Wikimedia foundation, the Wikipedia's internal structure is primarily shaped by endogenous forces, and it is highly flexible and self-transformative, because it does not rely on the acknowledgement of externally generated status criteria like educational degrees or professional reputation.
Evidently, it is certainly not an "expertocracy" governed by a reputational elite with formal educational credentials; it doesn't contain any trace of an "aristocracy" based on outstanding family background and breeding; and it is not a dictatorship stabilized by the repression and sanctioning of dissident voices.

Instead, it starts with "equipotent" participants and status inequalities are generated *ex post* as a consequence of different levels and qualities of performance.
"Equipotency means that there is no prior formal filtering for participation, but rather that it is the immediate practice of cooperation which determines the expertise and level of participation. It does not deny 'authority', but only fixed forced hierarchy, and therefore accepts authority based on expertise, initiation of the project, etc." (Bauwens 2005).

This means that participants have primarily to relay on their own judgment whether they are knowledgeable enough to contribute to a specific topic, or what they have to learn additionally in order to possess all the relevant information. And when modifying already existing texts, they need enough self-confidence for being sure that they know better than their predecessors. Especially in the large sphere of more marginal articles rarely read by anybody, it is crucial that only the most knowledgeable individuals feel a motivation for writing, while ignorants have at least enough insight and self-control to keep away.

While this "anarchistic individualism" has proven to be a viable starting point (because it does not predetermine specific organizational structures), there was never the intention to cling to it for fundamentalist ideological reasons. Instead, the overall mission to create a reliable encyclopedia made it necessary to create incrementally a highly "polymorphic" system that combines elements of very diverse regime types and organizational structures.[37]

[37] "Power structure" http://meta.wikimedia.org/wiki/Power_structure

First, It is still *“anarchistic”* in the sense that everybody can actively participate without membership duties, without even disclosing his or her personal identity.

Secondly, it is *“autocratic”* insofar as the founder (Jimmy Wales) has the towering role of a “God King” who can intervene in any possible ways without constitutional controls (Pink 2005). There is even an element of “latent totalitarianism” in the sense that an unlimited centralization of power is easily possible without any constitutional controls. Thus, Jimmy Wales himself and some of his admins sometimes exert the power to “redefine” even the history of Wikipedia: by eradicating earlier text versions so that no hints remain that they have ever existed. Evidently, the leadership of Wales was particularly crucial at the inception of the Wikipedia project where it was important to define the mission (to create an encyclopedia, and nothing else) as well as the most important behavioral norms. (e. g. the principle of neutrality). While the personal (somewhat “charismatic”) authority of Wales may be large accepted currently because he is considered as a “benevolent dictator”, it questionable how this personal authority will ever be substituted when he leaves.

Third, the WP structure is *“bureaucratic”* insofar as various roles with highly formalized competences and duties have been created**.** In fact the Wikipedia confirms the regularity that when open social systems want to maintain a higher state of order, they are forced to generate high (and permanently increasing) levels of formalization and highly sophisticated mechanisms of control, because they have to deal with a large variety of problem cases and with very heterogeneous collaborators. An increasing number of “admins” is regularly patrolling the system: with special competencies to block editing, delete articles and revert texts to earlier versions. Many of them do a rather regularized job by getting alerted whenever specific pages are changed. so that they consult in order to "approve" the additions or to revert unwelcome modifications.

Their appointment has itself become a matter or highly formalized nomination and voting rules , so that superior “bureaucrat” and "steward" positions had to be created for taking the decisions or supervising the procedures, and a highest elite of "developers" has emerged that can implement direct changes to the software and database. In addition, mediation bodies and a higher ranking “arbitration committee” have been installed to rule in cases of severe edit wars. And most importantly: an increasing canon of explicit rules, norms and procedures has been formulated for informing all users about the provisions they have to take when creating new or editing existing entries, and for guiding their informal policing activities. However, these bureaucratic mechanisms have only a subsidiary role insofar as they come into play only “*after substantial play has been given to self-policing by participants, and to informal and quasi-formal community based dispute resolution mechanisms.“ (Benkler 2006: 104).*

Fifth, the Wikipedia is *“democratic”* insofar as “admins” are selected by elective majorities (even if such elections are not based on a representative participation), and as many other decisions are the result of lively open discourse and deliberation (e. g. on the “talk” pages).

Sixth, it is somewhat *“plutocratic”* to the degree that is depends financially on donors who may have a say over the strategy of the whole enterprise, and that considerable

power is exerted by the governing board of the “Wikimedia foundation” – the non-profit frame organization which owns the material assets.

Seventh, it is *“technocratic”* insofar as specialists determine the development of Wikipedia on the software level (protocols, programs and network technologies).

And *eight*, finally, it is certainly highly *“meritocratic”* because only participants with high activity level and excellent performance records have a chance of being appointed to higher roles.[38]

Given the lack of "vested interests" usually pursued by fully paid employees and managers (e. g. for securing employment or maximizing prestige and power), there are good reasons to believe that the evolution of the WP's organizational structure follows "contingency theory"[39] by adapting flexibly to task types and environmental conditions.

A conspicuous characteristic of this organization is certainly the complementary interplay between decentralized structures centralized structures. a constellation not too far from conventional encyclopedic productions.

All printed encylcopedias always rely on a complementary relationship between
- a large number of outside experts who provide the bulk of content
- a much smaller circle of "editors" busy to correct, filter, streamline and synthesize the material.

There is some evidence that a similar labor division between "complexity generating" and "complexity reducing agents has emerged within Wikipedia, without conscious planning.
Thus, Aaron Swartz has found that most of the text volume is provided by rather perpheral users, while registered users and "admins" concentrate mainly on on additions, revisions, abridgments and deletions.
"When you put it all together, the story become clear: an outsider makes one edit to add a chunk of information, then insiders make several edits tweaking and reformatting it. In addition, insiders rack up thousands of edits doing things like changing the name of a category across the entire site -- the kind of thing only insiders deeply care about. As a result, insiders account for the vast majority of the edits. But it's the outsiders who provide nearly all of the content." (Swartz 2006)

Such empirical findings plainly contradict the position maintained by Jimmy Wales in innumerable speeches: that the Wikipedia is predominantly written by a rather small community of about 3000 regular Wikipedians.

They imply that the growth and diversification of the Wikipedia is primarily dependent on an expanding number of actively contributing users - not on an increased work load carried by more restricted cores.
While it is heavily important to make participation easy and rewardable for such large masses of occasional contributors, it is difficult to do this because these peripheral users have very little say and influence in the whole system:

[38] see: Wikipedia: Machtstruktur http://de.wikipedia.org/wiki/Wikipedia:Machtstruktur
[39] for a discussion of this term, see for instance Schoonhoven 1981.

"Unfortunately, precisely because such people are only occasional contributors, their opinions aren't heard by the current Wikipedia process. They don't get involved in policy debates, they don't go to meetups, and they don't hang out with Jimbo Wales. And so things that might help them get pushed on the backburner, assuming they're even proposed." (Swartz 2006).

On the other hand, the "editors" are an important factor in maximizing downloads and readership: e. g. by synthesizing materials, by eliminating technical jargon and by presenting the material in clearly arranged forms.

The future of the Wikipedia will heavily depend on he equilibrium between decentralized contributions and centralizing coordinations. It could easily be stifled if admins are turning to a heavy-handed regime, and it could explode in chaos if these editing services would weaken (e. g. because not enough unpaid volunteers are found for such rather "bureaucratic" tasks).
Another important problem is that these occasional contributors are too little involved in the discussions and modifications made after their postings. Very often, they may not consult "their" pages frequently enough to see the changes and deletions made by other users: so that modifications to the worse may remain uncorrected.

A similar symbiosis is found on the strategic level where centralized leadership is needed in order to direct the efforts of content producers into predetermined channels.
For instance, some more responsible editors create "stub articles" about hitherto neglected topics they think deserve encyclopedic attention. by doing this, they invite experts to channel their work energies on these topics.
In other cases, articles are characterized (with a remark below the title) as insufficient: needing elaboration or a better indication of sources.
In the future, more efforts may be needed to bundle such unsatisfactory pages into topical categories, and to address such bundles to specific groups of scholars: inviting them to contribute their valuable expertise.

It is important to see that internal centralization is fostered to the degree that the WP is confronted with external attacks to which is has to respond quickly and in a decisive fashion. Thus, Jimbo Wales has installed the policy of "office action" in order to avoid conflicts arising from imminent legal action or informal complaints (e. in cases of problematic biographic entries). Whenever a serious complaint is directed at Wikimedia Foundation (the legal person responsible for Wikipedia), Wales or one of his delegates remove the article temporarily, so that harm (e. g. personal slandering or libel) is avoided the justification of the complaint can be examined.[40]

6.6 Community embedment

Formal organizations are typically embedded in larger, less formalized structures. Many are components of societal institutions (like economy, polity, military, education) from which they derive their basic values, norms and structural patterns (Pow-

[40] http://en.wikipedia.org/wiki/Wikipedia:Office_Actions

ell/DiMaggio 1991), and others are parts of ethnic or religious collectivities or worldwide social movements (Zald/McCarthy 1987: passim).

In the case of the Wikipedia, this larger substrate may well be called a “community”: in the sense of a rather stable collectivity that acts as a breeding ground for common values and behavioral standards, as a group context for interpersonal communication, as a reference group for personal identification and as a supraindividual agency for effective socialization and social control:
“The important point is that Wikipedia requires not only mechanical cooperation among people, but a commitment to a particular style of writing and describing concepts that is far from intuitive or natural to people. It requires self-discipline. It enforces the behavior it requires primarily through appeal to the common enterprise that the participants are engaged in, coupled with a thoroughly transparent platform that faithfully records and renders all individual interventions in the common project and facilitates discourse among participants about how their contributions do, or do not, contribute to this common enterprise. This combination of an explicit statement of common purpose, transparency, and the ability of participants to identify each other’s actions and counteract them—that is, edit out “bad” or “faithless” definitions—seems to have succeeded in keeping this community from devolving into inefficacy or worse.” (Benkler 2006).

In contrast to communities that base their identity on a common history and tradition, on a specific locality or even on a particular founder, Wikipedians anchor their cohesion in the visible output of their cooperative endeavours: the Wikipedia as it flowers and raises in global recognition and reputation.
As an objectified structure, the Wikipedia has a dual quality: on the one hand, it constitutes a centralized focus on which all contributors fix their attention; on the other hand, it constitutes the decentralized environment in which every user easily finds his own "working niche".
While all work independently on their own subprojects, they at the same time feel a sense of togetherness: like masons working on different walls of the same cathedral. In contrast to the cathedral, however, the Wikipedia can become the workplace of thousands or even millions of (simultaneous) contributors without compromising this basic unity and centeredness which is the basis of communal integration:
This integration occurs rather independently of any horizontal interaction, because the vertical reference (of any peripheral member to the common focal center) generates enough sense of unity and social integration. In fact, this vertical (or radial) integration is so potent that users can engage in a multitude of controversies and conflicts without running the risk of desintegration. (The only threat is the exit option of "forking" with its segregative implications).

As seen in many cases, the Internet gives rise to new collectivities by allowing self-recruiting activists and self-constituted groupings to gain worldwide visibility and reputation by pooling their efforts and resources producing widely accepted goods and services.
Thus, the Linux community has become potent enough to challenge Microsoft on the level of operation system software, and the Wikipedia community seems to approach the status of global “cognitive authority” defining the canon of “uncontested human knowledge” as a result of a very extensive and long-term process of cooperative interaction.

“A thorough analysis of Wikipedia's policies and practices reveals an encyclopedia whose goal is to objectively reflect the popular perceptions of the general public, especially of the dominant, Wikipedian majority perceptions about cultural, scientific and intellectual issues.”[41]

Because formal hierarchical control is weak or inexistent, control has to be provided by the contributors in the form of self-guidance on the one hand and mutual peer-control on the other. Thus, the anticipation of being corrected by others subsequently can act as a powerful motivation to avoid errors:
“….knowing that another user can delete or modify my contribution if it is wrong or badly written compels you to try to get it right, so they won't have to.” (Wilson 2006).

The Wikipedia community resembles traditional communities in its tendency to close itself up and to keep itself clean from “deviant” and “unfitting” external intrusions. Such segregative tendencies are vividly seen in the “external link paranoia”: the widespread inclination of user-editors to minimize the hyperlinks leading to external websites, because they may lead the visitors astray to spheres “polluted” with ideology or commercialization.
“….many users at Wikipedia feel obliged to remove most or all external website links added to articles, whether they are useful or not. This includes legitimate links to websites directly related to the article at hand, perhaps because that external site has advertisements. Further, those who regularly add external links will find themselves being labelled as spammers or self-promoters and warned to cease their efforts or face being banned.”[42]

As a consequence, the integration of Wikipedia articles in the WWW is relatively low. (see Figure 12 above).

In some aspects, the Wikipedia is dominated by a “geek adhocracy”[43]: an aggregation of self-recruited activists whose dedication to the project is expressed in a very large amount of editing activity.
“A vigilant army of self-styled Wikipedians defend the site and enforce community policies based on the principle that Wikipedia is an encyclopedia and not a forum for advertisements, slanderous remarks or pictures of your cat. They police the site to try to establish a neutral point of view, warn users against violating copyrights, and call for respect toward the contributions of others. (Wilson 2006).

On the elementary levels of daily activities and interaction, the communal culture is manifested primarily in a particularized language. Thus, Wikipedians "revert" (or even "rerevert" pages when they reinstate an earlier version, they love "Wikignomes" who are dedicated to patient low-profile tasks like correcting grammar mistakes or broken links; and they hate "Wikitrolls" who permanently violate guidelines and engage in various disruptive behaviors.

Among the values of the WP community, a "passion for correctness" stands out that is manifested in many "edit wars" that appear highly ritualistic because they focus on

[41] Critical Views of Wikipedia http://www.wikinfo.org/wiki.php?title=Critical_views_of_Wikipedia
[42] Wikinfo: Critical Views about Wikipedia
http://www.wikinfo.org/wiki.php?title=Critical_views_of_Wikipedia
[43] for the meaning of this term, see Klein 2000.

very tiny points like orthography and punctuation. For instance, there was extensive discussion in the “September 11, 2001 attacks” whether a second comma should be inserted (after 2001).
„Maureen has consistently supported adding the comma, citing a variety of professional style guides for the rule that the year should be followed by a comma or other punctuation mark when a date is written out as day, month, and year. Jug and others argued that this custom does not apply in this instance, based on widespread usage with the comma missing, particularly in international English usage. They also pointed out that the guidelines cited by Maureen do not address usage when a date is used as an adjective, as it is in this particular situation.” [44]

As dissensus and quarrel lingered on for weeks and months, the page was not promoted to the status of a “featured page” in Jan 2005.[45]
Similarly trivial was a fight concerning the entry about scientology where contributors argued for nine months over whether the Scientologist method of childbirth should be called "silent birth" or "quiet birth."

Like most communal collectivities in the RealWorld, the WP community functions as a breeding ground for groupings that arise easily among the members for dealing with specific temporary tasks:
"There are mini-projects within the various language projects that focus on specific tasks, whether it be finding references, improving coverage of a field of study or helping to translate articles or messages between languages." (Lawler 2006).

Whenever the edition of an article is dominated by a highly consensual group, it becomes very hard for outsiders to intrude and to make their own contributions (Cormaggio 2006). This illustrates that the principle of openness of the project (implying that every anonymous user can edit all pages) can only be maintained when rather weak community ties among collaborators exist. In fact, community is functional for purposes of integration: e. g. for implementing homogeneous standards of filtering or for fighting vandalism, but it is rather disfunctional for diversification and growth: because such expanding activities demand openness for any new contributions.

Interestingly, the Wikipedia community has reproduced in the digital sphere the same dichotomy between "frontstage" and "backstage" performances that - according to Goffman - is a general characteristic of groups operating before a public (Goffman 1959).
On the one hand, there is the frontstage of serious work relationships: resulting in the articles everybody can see. Here, individuals are under pressure to be behavior in a highly disciplined: conforming to collective norms that strongly forbid the expression of subjective emotions, opinions or the playing out of intimate interpersonal relations.
On the other side, there is a high backstage of talk pages, online conference meetings and bilateral exchanges, that allow the playing out of spontaneous personalized activities and the satisfaction of socio-emotional needs.
“Like at a paid job, some people choose to extend the relationships they have within the ‘workplace’ to a context outside the workplace. Metaphorically (and, sometimes, literally!), they stop by the pub with their workmates and have a few beers. They may

[44] http://en.wikipedia.org/wiki/Wikipedia:Wikipedia_Signpost/2005-01-10/Features
[45] Ditto

joke about situations "on the job", they may talk about their personal lives. They may even do back-of-the-napkin brainstorming sessions that fix problems nobody expected. "Beers after work" happens on talk pages, User talk pages, on the mailing lists, in edit summaries, in person-to-person meetups, in private email, in IRC or Jabber chatrooms... the list goes on and on. Whenever Wikipedians drop their business-like demeanor and address each other as human beings, with warmth and personality, there's the smell of beer somewhere in the digital air."[46]

6.7 Keeping pace with current events and discoveries

Given the very long-term production and diffusion processes, conventional encyclopedias had all a strong bias in favour of past knowledge and knowledge about the past. This distance from current knowledge was aggravated by the need to check everything thoroughly (in order to preserve the reputation for reliability), and a strong tendency to rely on extant texts that have appeared already in earlier encyclopaedic editions.
Therefore, they always focused very much on knowledge as a stable, fully consensual canon of immutable facts (e. g. historical events, geographical locations, or just the meaning and spelling of words) or regularities (e. g. mathematical or natural laws), and they abhorred the fields of insecure and volatile knowledge where the state of the art changes weekly as a consequence of ongoing controversies or new scientific publications. Many (like Zedlers gigantic *“Grosses vollständiges Universal-Lexicon”*) did not include biographies of living persons. Most in harmony with the clumsy printing technology were thus dictionaries, gazetteers and historical encyclopedias: mere compilations of atomized information pieces that had never to be revised. The bias toward stable knowledge had also the effect that many encyclopedias presented themselves as treasuries of highly established elitist culture. Thus, the Brockhaus “Konversationslexikon” had the explicit goal of making bourgeois parvenus fit for successful participation in the more polite aristocratic circles of their time.

Therefore, only encyclopedias of very traditional societies could maintain the conception that they were mirroring the whole of true knowledge: e. g. the middle age encyclopedia “Speculum majus” of Vincent de Beauvais (1244) which aimed to provide a definitive view of “the world how it is and how it should become”.

At least since the Renaissance, encyclopedias have given up such ambitions by acknowledging that in a dynamic society with permanently advancing knowledge, attempts to crystallize out stable knowledge compilations can only have very limited success. The more their focus shifted toward natural sciences and technological branches, the more they had to face a world of constantly changing knowledge – without becoming ever able to react to such changes in any flexible way.

A very clumsy way to keep pace was to add periodic updates in the form of monthly additions (e.g. the “Larousse mensuel illustré” since 1907) or yearly volumes: (e. g. the “Britannica Book of the Year” since 1938). As there was no way to integrate the

[46] The Wikipedia Community
http://meta.wikimedia.org/wiki/The_Wikipedia_Community

chronological additions into the alphabetical or systematic structure of the original encyclopedia itself, they were not very helpful for the readers, because an ever growing number of chronological volumes had to be consulted. However, they had a useful function in complementing news media by setting daily events in a broader, encyclopedian perspective, because
"….they provide a more reasoned assessment and perspective than the daily newspapers and the weekly commentaries can usually achieve."[47]

Of course, there was also a sharp trade-off between size and updating possibilities. Only one-volume lexica (like the medical "Pschyrembel") could be frequently updated to keep pace with rapidly changing knowledge and terminologies. Paradoxically, updating was most difficult in the case of encylopedias most needing it: large multivolume works that contained detailed information much more subject to change than shorter dictionary entries.
This explains why the intervals between subsequent editions of the Encyclopaedia Britannica have increased between the 18th and the 19th century[48], despite the immensely accelerated production of new knowledge that would have made more frequent updates highly desirable.

Similarly, there was always a very unfortunate trade-off between updating capacities and the degree of interdependence and synthesis of the knowledge presented.
Updating is most easy in the case of highly atomized, fragmented knowledge structures like dictionaries or gazetteers, because each change or addition is only affecting a single entry. The more knowledge is presented in interdependent structures, the more frequently it occurs that a modification of one article has an impact on several other entries. For instance, when the biography of a politician has to be reassessed, this may have implications for other articles like the history of his country or his political party, in which this same person is involved. Similarly the emergence of a new scientific theory may affect many articles where its impact on the interpretation and explanation of different phenomena are discussed.

One of the most fundamental and most problematic innovations of the Wikipedia is to expand the notion of "encyclopedic knowledge" to phenomena of contemporary society and culture, to living persons and to current developments and events – thus entering into competition with journals, magazines and other news sources in the Mainstream Media system as well as in the Net.

In fact, Wikis are highly efficient tools for aggregating information about current events that are experienced by many witnesses from different angles: such as earthquakes, hurricanes and floodings, war battles, city riots, pandemies etc.
In such cases, they can act as platforms for the inductive collection of knowledge by many self-recruited contributors who may effectively enlarge and enrich (or also relativize or falsify) the information provided by professional journalists or from official sources (Dorroh 2005).
On several occasions, the WP has already proven its status as an authoritative news source because numerous contributors are busy to keep pages tightly up to date with unfolding developments and events:

[47] Encyclopaedia Britannica 2004; entry "Encyclopedia".
[48] The first edition (1768–71) was replaced by an essentially new and enlarged second edition in 1777–84; while the ninth edition (1875–89), remained in print until 1910.

".....news of the election of a new pope brought Wikipedians out in force to keep the article on Pope Benedict XVI up to date. The new pontiff's article was moved from 'Cardinal Joseph Ratzinger' to his papal title at 17:44 on 19 April, just 45 minutes after the white smoke had been sighted from the roof of the Sistine Chapel and just minutes after he was proclaimed as the new pope. Since then, the article has been subject to furious editing, accruing over 3,000 edits as of late evening on 24 April, 1,200 of which came in the first 12 hours of the article's life"

Similarly, the Israeli-Libanon conflict in summer 2006 gave quickly rise to a corresponding page that experienced more than 10 000 edits within a few days: offering a multifacted and highly balanced account of the unfolding war while keeping pace tightly with all the incoming news. [49]
Likewise, it took only four hours for the "Execution of Saddam Hussein" entry to evolve through 630 edits into a detailed account of the event as well as on the international reactions. Together with all the external hyperlinks, it reached a size more than 1300 words.[50]

Contrasting with the isolated short-term news reports in the media, such Wikipedia articles often combine timeliness' and historic depth at the same time.
By attracting a large number of contributors, such articles become sites of very time-compressed history construction "from below": by aggregating highly diverse information that cannot yet be integrated in overarching blueprints and concepts because the event - as well the way it is interpreted by the media and the general public - is still under way. The question arises whether such articles arising from current news are later reorganized in the light of subsequent developments and the broader, more distanced interpretations that usually go along with evolving time.

This hybrid role of the WP as a news source and a historical source has several far-reaching implications.

First, this implies that much of its content is focussing on matters widely apart from the canon of classical culture (like that transmitted in institutions of formal education) e. g., computer games, TV series or Heavy Metal music productions. Given the rather low average age of many most prolific collaborators (see 4.1), it is not astonishing that the entry about Augustinus is less comprehensive than that about Britney Spears.
Secondly, many articles are inevitably incomplete, erroneous and controversial, because they refer to subjects still in the realm of change and ongoing public discussion: e. g. recent scientific discoveries, still active writers or singers or unfolding political events. While the Wikipedia certainly derives a major part of its skyrocketing popularity from the fact that it can also be consulted in such current matters, it also suffers from the additional unrealistic expectations associated with fulfilling this widened role.
This problem has been dramatically highlighted at the death of Kenneth Lay (mentioned above), when the Wikipedia was heavily criticized because the true cause of death was only reported with some hours delay. Of course, such denouncements are just revealing to what degree the Wikipedia has already gained the status of a universal news-knowledge provider – not to be compared with a conventional encyclo-

[49] http://en.wikipedia.org/wiki/2006_Israel-Lebanon_conflict
[50] http://en.wikipedia.org/wiki/Execution_of_Saddam_Hussein

pedia which is given years for collecting, checking and reporting such kind of information.
However, it is remarkable that even the Wikipedia has preserved a conservative bias by disallowing the publication of any “original scientific studies”.[51] In other words: encyclopedic knowledge is still “second hand knowledge” that has already been certified by the academic community: so that very new, not yet certified knowledge has no place. Another ”traditionalizing” effect of Wikipedia stems from the easiness with which already existing online texts can be included by simple “copy and paste**”.**
Thus, the Wikipedia contains much material from rather antiquated encyclopedias that have been publicized on the WWW because they have become part of the public domain (e. g. the Encyclopaedia Britannica of 1911 and the “Catholic “Encyclopedia” of 1913).

Given its permanent modifications**,** however, the Wikipedia remains in a state of fluidity that makes it difficult to integrate its contents into larger and more stable cultural productions. For instance, it is difficult to cite a Wikipedia article in any other text (online or offline), because one always has to indicate at what exact time the article has been retrieved – it might have looked different a few minutes earlier and might be modified a moment later.

6.8 Changing usage patterns and user roles

5.8.1 Increased accessibility

Conventional encyclopedias are ridden by an unfortunate trade-off between size and usability. Only small packet editions are accessible in a way their knowledge can be retrieved in a manifold of places and situation and become part of many different human activities and social communications.
Larger editions are clumsy to handle, typically stationary in libraries or other rooms where few other activities than mere reading takes place.
As a consequence, many explicit ambitions of paper encyclopedias had to remain utopian: the Brockhaus or Meyer notion that it should support educated human discourse (“Konversationslexikon”) as well as the old Roman perspective that by providing all relevant human knowledge, encyclopedias could help individuals to carry out all their daily tasks on a higher level of competence.
The mere physical problem of handling many heavy volumes is an obstacle for cognitive synthesization. In fact, the increasing the number of articles has inevitably to be paid by a rising fragmentation of knowledge, because even when many cross-references are included (as in the classical Brockhaus editions), they are not likely to be followed because too much time and effort is needed to switch between different tomes.
Thus, the trend toward dictionary type encyclopedias with many smaller entries since the 19th century (Brockhaus, Meyer, Larousse) has almost eliminated the possibility to transmit more complex knowledge structures that transcend the atomized level of explaining the meaning of particular words, concepts or names.

[51] Wikipedia: No Original Research. http://en.wikipedia.org/wiki/Wikipedia:No_original_research

The Wikipedia's accessibility is much higher for three different reasons

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1. Hundreds of million users can reach it almost anytime and anyplace on the WWW. Given their easy accessibility (irrespective of size and internal fragmentation), digital encyclopedias can fulfil better the function for which their conventional forerunners have already been explicitly conceived: encouraging individuals to enlarge their cognitive world by acquiring at least some basic knowledge about a topic beyond their daily experience and professional expertise.
2. Every single user can access it in a large variety of situational conditions and roles: e. g. for getting immediately specific practical information for solving a current problem or for inserting it in a developing document or mail communication. The chances that such knowledge is actually mobilized when need arises are far greater – and they will increase additionally when Wikipedia knowledge is universally available in mobile hand-held devices. Such portable WP editions exist already for the ipod[52] as well as for notebooks and handheld ebook readers[53] and for the Mobile phone ("Wapipedia").[54]
3. Given the densely-knit hypertext structure of the Wikipedia, every user has at every moment a multiplicity of possible ways for navigating through the system: thus realizing his specific preferences or optimizing the way new knowledge can be integrated with what he or she already knows. In other words: individuals are better able to transform *decontextualized universal encyclopaedic knowledge* into *contextualized individual knowledge* that can be assimilated to particular individual thoughts and activities as well as social communications and cooperations.

This easy integration into microsocial contexts and individual roles provides good preconditions for expanding the sphere of the encyclopedia from factual and theoretical "know-what" knowledge to practical "know-how" knowledge that can be used in everyday life for guiding any kind of human action. For instance, by including advices about how to counter hiccups, how to relieve headache or how to prepare espresso coffee, the Wikipedia revives encyclopedic traditions of the 18th century where a similar weight was laid on such practical knowledge (e. g. the first edition of the Encyclopaedia Britannica 1768-71) – but with far better chances that it will be factually applied.

5.8.2 Combining receptive and participative roles

Until the 16th century, encyclopedists conceived their works for a small, rather neatly circumscribed circle of recipients that shared not only the same language, but also the cultural and religious background of the producers.
"In a way, they were performing the duties of a personal librarian in that they drew their readers' attention to innumerable passages that they believed might be useful to them in their worker their private lives."[55]

[52] http://encyclopodia.sourceforge.net/en/index.html
[53] http://infodisiac.com/Wikipedia/index.html
[54] http://www.wapipedia.org/wikipedia/mobiledefault.aspx
[55] Encyclopaedia Britannica 2004; article „Encyclopedia“

To the degree that these people knew each other personally, there could also be high informal feedback – among the recipients as well as between recipients and producers.

In the following period, printing technology was responsible for a drastic segregation between producers and consumers. As editors were increasingly confronted with an anonymous unknown public, they lacked the necessary information for matching their works with the recipient's preferences.
As a consequence, we see the spread of extremely "producer-guided" encyclopedias that are primarily conceived for expressing the cultural tradition of a national elite or the ideology of a intellectual movement (like the French encyclopédie), not for satisfying any needs of potential readers.
This dissociation was reinforced by the almost complete lack of backchannels: so that editors got no feedback from the reader's side that would have helped them to adapt better to their wishes.

In other words; there was a rigid trade off between expansion of readership and feedback: The wider the distribution (thanks to mass printing), the less it was possible to anticipate the structure and composition of recipients, and the more complete were producers socially isolated from their readers.
When using a conventional encyclopedia, I completely embrace the role of a pure recipient who is confident that the information found is correct. This generalized confidence may of course be based on the high reputation of the encyclopedia as a professional and reliable source, but in addition, it is also made inevitable because as a reader of the encyclopedia, I have no immediate access to alternative information sources and no possibility to communicate with the responsible producers. Under these conditions, of course, reliability is absolutely essential; unreliable encyclopedias are completely useless. As a consequence, printed encyclopedias resemble phone directories or train timetables by aiming at an ideal state of "complete accuracy" - what implies heavy costs because high marginal costs are associated with finding and eliminating the very last remaining error.
Thus, conventional encyclopedias foster the regressive role of an "unconditional believer" who doesn't take any critical stance. Publishing occurs only at the final point of a very long and complicated editing process that is usually completely hidden from the eyes of outside observers. This implies the premise that readers are only interested in the product, not in the intermediate processes of production.

By contrast, Wikipedias develop in public, so that all participants can not only observe and evaluate all successive stages of development, but also participate in the formation and modification of the rules by which they are guided, and intervene whenever they see a reason. Thus, the categorical dichotomy between "producers" and "readers" gives way to the hybrid role of the "participant" or "user" who can combine both roles in a way completely at his own choosing: by sifting through materials others have written at one moment and by posting his own contribution at another.
As every article is permanently "under construction", users feel invited to read everything with a critical eye and fundamental provisos: ready to validate any information by additional sources whenever absolute certainty has to be achieved.

As a Wikipedia user, therefore, my role is rather complicated, because I have to combine my stance as a "faithful recipient" with an element of sceptical role-distance:

maybe the current content contains errors or has been vandalized ten minutes ago – and in both cases, I may assume the responsibility of not only *noticing*, but actively *eliminating* such flaws.

It has often been remarked that in contrast to oral speech, written texts facilitate critical reflexivity because they stand out as objectified artefacts that can be interpreted by anybody at very different occasions from widely different angles. Thus, they give rise to a communicative meta-level where they themselves become the object of oral talk or written commentaries. However, these reflexive capacities could not develop fully in the printing age, because in most cases, readers had no feedback channels available for expressing and communicating their thoughts.

Digital texts on the Internet are disposed to catalyze much higher levels of reflexivity for two reasons:
1) because feedbacks can easily be made by using the same medium that has given rise to the primary text;
2) because feedbacks are themselves in a written form: so that they easily become themselves the objects for further (their order) reactions.

Wikis have a particular capacity to evoke critical reflections, because they make it extremely easy for every user to implement changes and commentaries, while keeping everything that was ever written ready for retrieval.
Thus, the Wikipedia invites me to read articles with the critical eye of a potential corrector because I have the permission to make changes whenever I see the need. In addition, I may feel invited to post my opinion on the appending “talk page” where there is lively discussion about controversial issues (on a terminological, conceptual or substantive level).

On a more general level, the Wikipedia catalyzes reflection because millions of users contribute to a very wide range of opinions and preferences – engendering controversies on the primary level of substantive knowledge as well as on the metalevel of procedural norms.
For instance, highly sophisticated discussions about the neutrality principle are constantly going on: giving rise to a heightened awareness of all the subtle, implicit ways it can be violated (e. g. by using insinuating “weasel words”).
“One of the phenomena we are beginning to observe on the Internet is an emerging culture of conversation about culture, which is both self-conscious and informed by linking or quoting from specific reference points. The flexibility with which cultural artefacts can be rendered, preserved, and surrounded by different context and discussion makes it easy for anyone, anywhere, to make a self-conscious statement about culture. The result is, as we are already seeing it, the emergence of widely accessible, self-conscious conversation about the meaning of contemporary culture by those who inhabit it.” (Benkler 2006: 294).

This reflexivity is particularly manifested in the human sciences where there are many scientific concepts that have an intrinsic ideological bias because they have been created and elaborated by people sharing a particular (e. g. political) view.
For instance, this is the case for the term "Right Wing Authoritarianism" that has come under fire by conservatives who claimed that it has an intrinsic leftist bias:

"I think that as a general subject area, the study of prejudice is biased against right-wing people because the majority of the research is done by left-wing individuals, often radical left wing (e.g. Jim Sidanius is a former Black Panther). I think it it wouldn't be impossible to make the article NPOV,"[56]

In such cases, it is very helpful that in the article's heading, it is indicated that a discussion about its neutrality has arisen: so that readers get sensitized to these problems of which they otherwise would not be aware.
Such examples illustrate to what degree the Wikipedia has the potential to internalize dissensus and conflict instead of communicating a fictious impression of universal agreement. While conventional encyclopedias support the notion of a canon of "unquestioned truth" (by simply leaving out dissensual views), the Wikipedia is open to reflect any kind of manifest dissensus - thus submitting all truths to a much harsher test of acceptance.

By its mere lack of reliability, the Wikipedia demands mature recipients that are capable of receiving information while at the same time preserving a critical attitude: motivating them to corroborate the information by consulting additional sources.
A critical stance is particularly encouraged in cases where an article is highlighted as being “controversial” (e. g. about Taliban, homosexuality etc.): so that users know in advance that they have to rely on their own judgment, instead of absorbing a nonpartisan, “absolutely neutral” point of view.

Evidently, all these possibilities for personal participation provide ample opportunities to solve tensions and conflicts in smooth, inconspicuous ways. If I disagree with an entry in a conventional printed encyclopedia, I have no alternative than to protest harshly or even sue the editors legally. When the same happens with a Wikipedia entry, I have many other less offensive options: correcting the entry myself or writing to admins that it should be corrected.
Similarly, when articles are of low quality and transport erroneous information, this may not be a reason for denouncing the whole enterprise and for changing to alternative encyclopedias, but just engender the motivation to contribute personally to an improvement.

6.9 Public visibility of production processes and resilient adaptation

We all know to what degree all major cultural achievements are factually the products of widespread and enduring collective efforts. Thus, the evolution of law has been promoted by a multitude of infinitesimal contributions like court judgments, legal commentaries or academic opinions; and advanced technologies are the results of manifold improvements enacted by anonymous engineers and technicians.
However, we usually see just the final products, while the production processes remain hidden: inaccessible for analysis as well as for deliberate control. Thus, when Berger/Luckmann follow Husserl and Schütz in characterizing empirical reality as an

[56] http://en.wikipedia.org/wiki/Talk:Right_Wing_Authoritarianism

“intersubjective construction”, they just indicate at the result without unveiling the underlying processes that have lead to it –so that it remains unclear who has participated to what extent, and whether the said processes could have let to alternative results (Berger/Luckmann 1999: passim).

The word “tradition” is usually applied to such past legacies in which we find ourselves embedded like in natural biotopes, unable to know why and how they have come into existence and unable to determine their further development in the future.

Seen under this perspective, the online productions in Peer-to-Peer networks are innovative in the sense that they make cultural production processes explicit and completely visible to all interested eyes. They share with “traditions” the basic feature that the products of collective endeavours degrade individual authors to the modest role of mere “contributors”. But unlike “traditions”, these contributions can be identified, regulated, modified or reverted at will, and the system of rules under which these contributions generated can be explicitly stated and systematized as well as changed by specified authorities and transparent formal procedures.

All encyclopedias must find ways that the information they convey is accepted as "authoritative": in the sense that normal recipients believe that it is reliable and that it represents the most advanced state of knowledge available at the current time.

In the printing age, there was no alternative than to rely on indirect authority of personal credentials: The authority of the encyclopedic knowledge was derived from the high reputation of its contributors: e. g, their academic degrees, Nobel prices, etc.
Of course, this implied a high trust in the formal institutions responsible for distributing such credentials: e.g. in the quality of academic education and certification.

By contrast, the Wikipedia can make itself independent from such derived authority sources because it is able to produce its own primary authority which emerges from collective online interaction. In other words: Wikipedia articles are not trustworthy to the degree they stem from reputated scholars, but to he extent that are the (preliminary) end product of all the preceding edits and discussions to which many collaborators with different perspectives and knowledge background have contributed. Why do these procedures make knowledge authoritative? Because they have been going on in public light and have been stored in a fashion that they can be recapitulated by anybody anytime: at present and in the future.

Thus, the Wikipedia exemplifies Luhmann's hypothesis that in modern societies, traditional legitimation is replaced by "procedural legitimation" ("Legitimation durch Verfahren") (Luhmann 1968). (Another example is the evolution is the political system where modern law derives its authority no longer from tradition or the charisma of a founding leader, but from widely accepted and transparent of law-enacting procedures (e. g. citizen votings or parliamentary decisions)).

From a functional point of view, this provides the basis for flexible self-correction processes that enable the Wikipedia to cope successfully with a wide range of exogenous and endogenous disturbances.

Social systems can be classified according to they way they deal with events that may threaten their essential structures and functioning's. At the one extreme point, there are “resistant systems” that defend themselves against disturbances by preventing their emergence (by suppressive activities) or their intrusion (by boundary controls and filtering). At the other extreme, we find “resilient systems” that allow any disturbances to enter, but then mobilize self-correcting activities in order to eliminate them in due time or to make them compatible with their own structures and goals.

Conventional encyclopedias are clearly “resistant systems” that emerge in the context of formalized and centralized organization. By applying highly selective methods of recruitment, bureaucratic rules and permanent supervisory controls, they take care that from the onset, no deviant productions caused by dilettantism or intentional vandalism are generated. Such unbending discipline is all the more important as texts are finally frozen on paper, so that no corrections can be made *ex post.* Processes of improvement and growth typically take the form of discrete major steps (e. g. "editions"): each of which characterized by a multitude of smaller changes (or even a major change in the work's architecture).

By contrast, Wikis develop continuously over a very large number of minor revisions, so that users may find a slightly modified version at every moment of consultation.
Thus, they remain forever in the unfinished stage of "Perpetual Beta" (Tim O'Reilly): by inviting users of any specific article have to adopt an attitude of "critical acceptance" by synthesizing two contradictory expectations at the same time: that the information offered is basically correct and useful, but still so incomplete and faulty that corrections, improvements and updates are needed (O'Reilly 2005). In the case of commercial goods or services, such a philosophy of "continuous improvement" is difficult to adopt, because customers find themselves at a loss when they try to gather sufficient information about the products' current quality (and corresponding price).

Thus, the Wikipedia exemplifies the resilient-type system that remains permanently vulnerable to all kinds of disturbances, so that the maintenance of order is completely dependent on the self-correcting activities that set in after they have intruded. The way it works is by having a large number of people who keep track of recent changes, often through watch lists, which notify the user whenever a page they have marked has been edited.

As all the subsequent versions of an article are stored in the “page history”, it is technically extremely easy for anybody to cancel any recent changes by just restoring an older version. This feature results in a “conservative bias” which is of course functional for fighting vandalists or fierce ideological crusaders, but which may also discourage new contributions (because of the fear that even very laborious contributions are just wiped out).

In a study of the page histories of Wikipedia's English language version, MIT and IBM researchers Viégas, Wattenberg, and Dave have demonstrated that most Wikipedia vandalizations are usually corrected within very short time (a few minutes), so they will escape the notice of most users (Waldman 2004).
“Our chief conclusion is that Wikipedia and its audience must be viewed as a system in which constant change is a source of strength as well as weakness. The site is

subject to frequent vandalism and inaccuracy, just as skeptics might suspect—but the active Wikipedia community rapidly and effectively repairs most damage. Indeed, one type of malicious edit we examined is typically repaired within two minutes." (Viéga/Wattenberg/Dave 2004)

The efficiency in dealing with vandalism demonstrates vividly that Wikipedians constitute a tight community – despite the large geographical distances and very weak personal ties among the members:
"What is perhaps surprising is that this success occurs not in a tightly knit community with many social relations to reinforce the sense of common purpose and the social norms embodying it, but in a large and geographically dispersed group of otherwise unrelated participants. It suggests that even in a group of this size, social norms coupled with a facility to allow any participant to edit out purposeful or mistaken deviations in contravention of the social norms, and a robust platform for largely unmediated conversation, keep the group on track." (Benkler 2006: 74).

Resilience implies that at any given moment, the system looks somewhat degraded or even chaotic, because it contains a certain number of (yet) uncorrected errors, Of course, no such deficiencies are tolerable in cases where information has to absolutely reliable because highly consequential actions are based on them (e. g. timetables, price lists, legal codes, telephone directories etc.).
On the other hand, resilience provides flexibility and openness for innovation, because systems remain free to decide which of the intrusions have to be treated as negative disturbances to be eliminated, and which as should be seen as enriching "innovations" that should be kept (or even subject to further elaboration).

Generally, resilience implies that the system's internal order is permanently dependent on a high level of supervisory and correcting activity exerted by large numbers of participants, and on a rather modest flow of disturbances, so that the work load of the controllers is not too high. Thus, the Wikipedia will always have to be embedded in a vibrant "Wiki-community" where the basic values as well as the detailed operational rules of the system are consciously upheld, transmitted and incessantly concretized in specific actions. Resistant systems, on the other hand, can often go along with rather simple and rigidly frozen organizational structures, because as they repress or filter out so many contingencies, they face a much less complex environment. These ongoing adjustments find expression in a rapidly expanding layer of "meta-communication": encompassing "particularly all the "talk pages" where the primary content of the articles becomes the topic for reflection and controversial discourse. Viégas et. al have found that that these talk pages and the additional "meta pages" (dedicated to matters of coordination and administration) have experienced a disproportional growth. In the time period considered, their quantitative share in the whole text system having increased from 15% to 30% (until October 2005) (Schiff 2006).

Whenever a topic is controversial (e. g. because of ideological and emotional reasons), a transitory period of "irrational" postings characterized by extreme opinions can be observed, before more objective, neutral formulations (which then remain stable) take the lead. Sometimes, fierce "edit wars" are engendered between participants who permanently erase each others version. For setting limits to such escalations, the 3RR rule was established: forbidding any single user to enact more than

three reversions of a page within 24 hours (except in cases of manifest vandalism).[57] In addition, a temporal protection of a page can be requested in order to cool down heated editorial warfare.[58] Such temporal measures are highly effective because most edit wars is associated with current public moods and discussions that rapidly fad away when other topics come up. The more controversial a topic, the longer is the time period during which users may be confronted with rather one-sided, opinionated entries. But in the longer run, emotions tend to cool out, so that extremist passages are weeded out and substituted by more neutral formulations in accordance with the official “Neutral Point of View” (NPOV).

Mechanisms of resilient self-corrections are highly functional for dealing with smaller, decentralized problem cases that can easily be handled by the voluntary patrollers.
However, they reach limits in cases of sudden massive disturbances that may lead to a “work overload” of these policing members. In such cases, resilience has at least partially to be substituted by defensive resistance measures, so that intrusions are blocked *before* they enter the system.
Such a situation occurred at August 1st 2006, when the American Comedian and Satirist Stephen Colbert told his viewers to update the Wikipedia article “Elephant* in order to include the information that “the population of African elephants has tripled within the last three months.” After this broadcast, dozens of viewers crowded to the Wikipedia site in order to insert this addition, while policing users quickly got equally active for permanently reverting such massive vandalizations. Very soon, administrators exerted their competence to semi-protect the page: making it temporarily impossible for any unregistered and new users to implement changes. As even registered users continued to insert the misinformation, the site then was momentarily completely immunized against changes by setting it under “full protection.”
This example illustrates that in contrast to their printed predecessors, digital encyclopedias can combine resilience and resistance in highly variable ways: e. g. by limiting protection to particular pages, user categories and/or specific spans of time. Of course, the deliberations on such decisions is also adding to the hypertrophic overhead of “meta-discussions” as well as to the never-ending expansion of formalized procedures and rules.

6.10 Unguided incrementalism and unplanned “memetic evolution”

The WP relies on a complex process of "cultural darwinism"[59]: which is based on the functional interplay between three mechanisms:

1) Production of variation:
generated by broad base of users who produce a large pool of memetic variants: by creating new articles, inserting additional information and proposing alternative formulations.

2) Selection procedures:

[57] Wikipedia:Three-revert rule: http://en.wikipedia.org/wiki/WP:3RR

[58] Wikipedia: protection policy http://en.wikipedia.org/wiki/Wikipedia:Protection_policy

[59] see Campbell 1965.

provided by collaborators (including admins and bureaucrats) busy to scan and filter all these new entries in order to weep out nonsense and to keep the WP's evolution in line with specific standards.

3) Mechanisms of stabilization:
based on a third layer of activities preventing and reverting cancellations and vandalisms, so that the acquired quality level of the WP is maintained.

The speed and direction of evolution depends heavily on the working of these three sets of mechanism and on the specific may they are combined. For instance, too high production rates in innovative variations will bring even highly efficient filtering mechanisms to the limits of their capacity, and on the other hand, variant production may easily shrink when collaborators see that most of their contributions are constantly weeded out.

We may safely contend that the open source model of the Wikipedia favours variation over selection and stabilization, because inn decentralized peer-to-peer networks, there are no hierarchical agencies deciding about right and wrong, effectiveness and uselessness or falsity and truth.
Instead, such authoritative decisions have to be substituted by horizontal control processes among the collaborators: preferably guided by similar norms of universalism, communism, disinterestedness and “organized scepticism” as they (should) reign in ideal-type scientific communities (Merton 1942).
Of course, in the case of highly specialized entries where the number of experts and visitors is very small, simple lack of manifest dissensus will not be a sufficient indicator that consensus has been reached: because even major insufficiencies and flaws can persist for long time spans when nobody takes notice or motivated to make any additions. The higher the user activity, however, the more the assumption is justified that lacking criticism indicates that “everybody” (or at least: many visitors with very different viewpoints) actually agrees – or that some disagree so little that they don’t find it worthwhile to articulate dissent or make corrections.

As we can learn from successful scientific or technical communities, such horizontal peer exchanges are most functional when all members can easily agree whether a contribution made is valuable, a specific problem has been solved, or particular goal has been achieved, because the outcomes can be objectively assessed and evaluated. This is certainly the case in open source software production projects (e. g. Apache or Linux) where any piece of proposed code can immediately be tested whether it is functional or not. Under such conditions, no hierarchical evaluations and authoritative selection processes are necessary because successes and failures stand out objectively, so that they can easily be verified and corrected by any member of the community.

It is evident that in open source encyclopedias, such preconditions are not persistently fulfilled. For sure, there are many contributions whose truth or falsity can easily be assessed, because they relate to highly indisputable, objective facts, natural laws or mathematical-logical operations. Here, errors may become rapidly eliminated because whenever a correction “to the better” has been made, nobody has any sound reason to return to the earlier version.

However, many contributions are “arguable” in the sense that they rely on viewpoints, opinions and evaluations that vary between the contributors as well as between the sources on which they rely. In such cases, the return to hierarchical controls may be inevitable in order to end “edit wars” that would never end by themselves because there is no objective test for adequacy or truth (Schiff 2006).

The idea of a Wikipedia would be particularly displaced if a “constructivist” epistemology is maintained: because this would mean that instead of general theories competing for universal recognition (in a Popperian sense), there are only co-existing “narratives” which are consensually accepted only within confined and transitory "discourse communities".
The most adequate epistemology for the Wikipedia is evidently an objectivist paradigm of truth: the belief that knowledge about everything can reach a definitive form on which all reasonable human beings can (or even must) agree. It’s no surprise that Jimmy Wales clings firmly to an objectivist understanding of knowledge which gives him the confidence that contributions finally converge in the approximation to a definitive intersubjective and intercultural truth.[60] Contrary to most contemporary epistemological philosophers, true Wikipedians believe in an absolute aperspectively constructed truth existing beyond all cleavages of particularistic and idiosyncratic human opinions and convictions:

While the WP shares this premise with traditional encyclopedias, it contrasts sharply by following not a deductive, but a highly inductive way of objectification.

Printed encyclopedias have an affinity toward deductive processes of reasoning and classification because their top-down organization makes it necessary to begin with blue print knowledge structures which then are filled out by the different contributors. In natural science, for instance the editing committee typically relies on highly accepted taxonomic systems, so that specialists can be searched and invited to deliver contributions about specific chemical elements, or about different, orders and genera and species of animals and plants.
By functioning as ex ante premises of encyclopedia organization, such conventional conceptual frameworks are reinforced rather than called into question - because scholars that maintain deviant concepts and typologies will not be invited.

A most outstanding example for this deductive top-down conceptualization is the Propaedia that came with the 15th edition of the Encyclopedia Britannica (in 1974): a 1000 pages book offering an extremely detailed outlay of all spheres of human knowledge by classifying it into ten major spheres and by disaggregating each sphere on seven hierarchical levels.[61] It may be considered one of the most conservative books in recent history: because whoever uses it has no alternative than to let his searching activities guide tightly by these authoritative conceptual schemes.

Wiki-based encyclopedias certainly also cling to these pre-existent conceptual structures, because most collaborators identify with them, and because editor use them for channelling incoming contributions (e. g. by creating "stub"-articles about concepts that deserve a more elaborate treatment).

[60] http://dv.wikipedia.org/wiki/Jimmy_Wales
[61] http://en.wikipedia.org/wiki/Prop%C3%A6dia

In addition, however, they have an intrinsic leaning toward inductive conceptualizations that are arising out of an uncoordinated multitude of independent proposals. Such "folksonomies" are characterized by a more prototypic than categoric way of categorization: so that imprecise and overlapping interpretations and attributions may occur.

*"A **folksonomy** is an Internet-based information retrieval methodology consisting of collaboratively generated, open-ended labels that categorize content such as Web pages, online photographs, and Web links. In contrast to professionally developed taxonomies with controlled vocabularies, folksonomies are unsystematic and, from an information scientist's point of view, undependable and inconsistent; however, for Internet users, they dramatically lower content categorization costs because there is no hierarchically organized nomenclature to learn."*[62]

Such inductive terminologies have the advantage that they remain open for flexible innovation - due to the rise of new phenomena or the change of relevant differentiations (e. g. when new, cultural fashions (like music styles, or art forms) or unprecedented ideological or religious movements arise).
On the other hand, they have extreme shortcomings because their usage remains basically restricted to the collectivities that have produced them, and they remain ambiguous (e. g. because often several different meanings are given to the same terms).

In the wide areas (like politics, ideologies and religion) where objective truth can never be attained, the Wikipedia tries achieve consensus by clinging to the "Neutral Point of View" (NPOV): one of the thee highest-ranking guiding principles of the official Wikipedia policy that is defined to be immutable even if all editors would agree on a modification.[63]
"The neutral point of view attempts to present ideas and facts in such a fashion that both supporters and opponents can agree. Of course, 100% agreement is not possible; there are ideologues in the world who will not concede to any presentation other than a forceful statement of their own point of view. We can only seek a type of writing that is agreeable to essentially rational people who may differ on particular points.[64]

By aiming at a "neutral point of view", WP envisages an optimistic belief in the possibility of reaching at least a minimum universal canon of human knowledge that is accepted consensually by all "rational human subjects", because it cannot be meaningfully refuted.

In the tradition of rationalistic strands of philosophical thinking (Leibniz, Kant and Habermas), it is supposed that there are highest level principles of "formal reason" on which all human subjects – irrespective of any divergences on any "material" questions – may voluntarily agree.
"Wikipedia represents a belief in the supremacy of reason and the goodness of others. In the Wikipedia ideal, people of goodwill sometimes disagree. But from the re-

[62] http://en.wikipedia.org/wiki/Folksonomy
[63] http://en.wikipedia.org/wiki/Wikipedia:Neutral_point_of_view
[64] http://en.wikinews.org/wiki/Wikinews:Neutral_point_of_view

spectful clash of opposing viewpoints and the combined wisdom of the many, something resembling the truth will emerge. Most of the time." (Pink 2005).

In a multicultural world, such a consensus about evident truth can evidently most often not be reached on the primary level of substantive evaluations or empirical facts, but only on the secondary formal level: on the assertion that there exist people who hold certain principles for valid or who hold certain facts to be true.
“An encyclopedic article should not argue that corporations are criminals, even if the author believes it to be so. It should instead present the fact that some people_ believe it, and what their reasons are, and then as well it should present what the other side says. Perhaps the easiest way to make your writing more encyclopedic, is to write about what people believe, rather than what is so. If this strikes you as somehow subjectivist or collectivist or imperialist, then ask me about it, because I think that you are just mistaken. What people believe is a matter of objective fact, and we can present that quite easily from the neutral point of view."(Wales 2001).[65]

Thus, only noncontroversial topics can be treated on a primary level (=discussion of facts); all controversies have the effect that a topic can only be discussed on a meta-level: representing “fairly” all the different positions and beliefs. (Sanger 2001).[66]
“Properly speaking, the neutral point of view is not a point of view at all, because when one writes neutrally, or without bias, one is very careful not to state (or imply or insinuate or carefully but subtly massage the reader into believing) that any particular view at all is correct.” (Sanger 2001).

This statement clearly demonstrates how difficult it may be to avoid all perspectivism even on subtle, inexplicit levels of textual structuring and linguistic expression.
For instance, the mere sequence in which positions are represented (or the volume of text allocated to them) implies decisions which are most certainly guided by subjective preferences. Similarly, authors will reveal their subjective opinions in innumerable other ways: e. g. by characterizing various positions as “popular”, “sectarian” or “empirically founded” views, or by focussing content ethnocentrically on their own nation and culture (Sanger 2001).

If it is difficult to describe an empirical fact or development fairly, why should it be less difficult to describe disputes about such facts or developments in fair, objective terms? Can any contributor be expected to have full knowledge about any such dispute and about the number and quality of its supporters (even within a small time span and geographical area), especially in cases where they have been shaped by many scientists and intellectuals with very different positions? As Sanger states, it is useful to treat this as an empirical not as a philosophical question. It can be answered affirmatively in all cases where articles have reached a stage where they are factually accepted (=not generating any additional controversial discussions) (Sanger 2001).

In fact, however, such highly relativistic principles are not fully maintained in the Wikipedia, because in most cases, the positions that claim “scientific” validity are

[65] Wales, Jimmy „Neutral Point of View“ 2001
http://web.archive.org/web/20010416035757/http://www.wikipedia.com/wiki/NeutralPointOfView
[66] Sanger, Larry, Neutral point of view-draft (20. Dec. 2001)
http://meta.wikimedia.org/w/index.php?title=Neutral_point_of_view--draft&direction=next&oldid=730

privileged in relation to "sectarian" exotic positions (even when these would have a higher absolute number of believers). (e. g. Darwinist evolution theory is taken much more serious than creationist views). If this "unity of scientific doctrine" would be abandoned, the Wikipedia would degenerate into a universe of ethnographic narratives that would have to give room to all endogenous cultures and all (even highly exotic) minorities of dissident believers.

While the strategy of representing different viewpoints or theories cannot be stretched to include every possible position maintained by any individual or tiny group, it can nevertheless be applied in order to end "edit wars" between those positions over which there is an actual fight between different Wiki contributors.
Thus, we arrive at the conclusion that the "truth" developed in the Wiki process merely represents a reconciliation between positions actively maintained by online editors: just a "truce" between adversaries who have decided to end edit wars because they all find their own different views adequately represented – or because they have become just too tired to fight on.
"In order to avoid the problem of endless edit wars--and indeed, for the liberating reason of allowing people to make up their minds for themselves--we should agree to present each of these views fairly, and not make our articles assert any one of them as correct. That is what we mean by making articles "unbiased" or "neutral": to write from a neutral point of view, one presents controversial views without asserting them; and to do that it generally suffices to present the view in a way that is more or less acceptable to its adherents, and also to attribute the view to its adherents." (Sanger 2001)[67]

As current events and developments (discussed in the media) are most likely to engender heated debates, an effective measure to deescalate conflicts may be called the "strategy of deactualization".
For instance, there was much debate about articles called "Persecution by Christians" (Muslims or Jews), and votings nearly resulted in their deleting. However, these pages were kept, but partially neutralized by being renamed into *"Historical persecution of Christians"*[68] *(or Muslims*[69]*)*: in order to avoid overt conflicts about current events.(Unsurprisingly, an even stronger measure of neutralization was implemented in the case of Jews, by renaming the entry into *"Ancient historical persecutions by Jews"*[70]*).*

Evidently, the Wikipedia invites us to see the process of human knowledge production as a process of Darwinian "memetic evolution"[71]. The cognitive patterns fittest for survival are those maintained by strong, highly articulate individuals or groupings motivated and able to defend their views successfully in "edit wars". If they are completely victorious, they may be able to define their opinion as the only "scientifically founded position": so that alternative positions receive much less (or even no) explicit recognition.

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[67] Sanger, Larry, Neutral point of view-draft (20. Dec. 2001)
http://meta.wikimedia.org/w/index.php?title=Neutral_point_of_view--draft&direction=next&oldid=730
[68] http://en.wikipedia.org/wiki/Historical_persecution_by_Christians
[69] http://en.wikipedia.org/wiki/Historical_persecution_by_Muslims
[70] http://en.wikipedia.org/wiki/Ancient_historical_persecution_by_Jews
[71] for a clarification of this term, consult Dawkins 1993 and Lynch 1998.

Thus, the Wikipedia is exposed to the same critical arguments as they were directed by the ancient Greek sophists against any consensualist theory of truth: *"There is, I think, a deep flaw in the philosophical grounding of the whole project, the assumption that 'truth' can somehow emerge through consensus. What emerges- depending on the topic- is a kind of mad Berkeleian world, where ideas struggle for dominance in complete disassociation from physical reality-I shout the loudest, therefore I am!."*[72]

The problem arises from the fact that whenever there is a memetic competition, it is highly probable that the engagement of the different sides is not equal in strength.
For instance, religious believers may be extremely determined that the entry on their founder does not contain any "negative" biographic information, while all the outsiders may have very little interest in this whole matter.
As a consequence, the believer's zeal to keep the article "clean" is not counteracted by a similar effort of nonbelievers to keep it in accordance with the standards of the "Neutral Point of view".
"Ironically, this means that any idea widely considered too insane to be criticized will have a favourable article written about it, since its advocates are fanatical about the issue while its opponents consider it too crazy to bother with. Keep in mind that what makes these controversies asymmetric is not the number of people on each side, but the intensity with which they defend their views. One single-minded user with a lot of time on his hands can hold off many disinterested users at once."[73]

It is evident that the Wikipedia has to rely very much on widespread groups of liberal nonbelievers that are ready to fight for their Western standards of tolerance, openness and objectivity with the same fervour and zeal religious fundamentalists defend their dogmatic beliefs.

Evidently, this implies an openness toward multiple and changing viewpoints that is not consistent with closed dogmatic belief systems as they are maintained by Islamists or other adherents of religious fundamentalism.
It's no surprise therefore that such medieval minds feel threatened by an intellectual enterprise in which they see no chance to dominate and to eradicate unwelcome "dissident" views.

This position is well formulated in an essay of Abid Uallah Jan who criticises that in he WP article on Islamism, "cultists" like Ahmadis, Habashis and Ismaelis are considered to be Muslims despite the fact that in contrast to "True Moslems", *"...they do not believe in the totality of the Qur’an and the finality of the Prophethood". (Abid Ullah Jan 2006a).*

A WP editor has responded that these groups are considered to be Moslems because they themselves maintain such an identification.

[72] Comment of User:Rcpaterson in: Wikipedia: Expert retention
http://en.wikipedia.org/wiki/Wikipedia:Expert_Retention
[73] User:Nikodemos/Asymmetric controversy
http://en.wikipedia.org/wiki/User:Nikodemos/Asymmetric_controversy

"Wikipedia writes about groups that claim to be based on Islam as such. We are not arbitors on whether they are wrong or not. It is mentioned that the majority believe them to be deviant... however, we do not label who is Muslim and who is not."[74]

Abid Uallah Jan's essay makes it evident that from an Islamist point of view, the Wikipedia is a particularly effective weapon in the War of "Islamophobes against islam" because is contains innumerable formulations that appear faulty, inimical or even blasphemic from a strictly fundamentalist perspective: statements hard to fight against because they stem from so many different (and mostly anonymous) sources:
"If there is any tool that will play a longer and effective role in the hands of the promoters of the clash of religions, it is Wikipedia and other similar projects on small scale. One can avoid reading the visible and known hate-mongers such as Thomas Friedman, Steven Emerson, Bernard Lewis and Daniel Pipes. It is, however, impossible to see the thousands of Friedmans and Pipes filling up the pages of Wikipedia for poisoning public mind on both sides of the divide." *(Abid Ullah Jan 2006a).*

Of course, trying to synthesize a "neutral assessment" is in itself an authoritarian endeavour because all other (e. g. monographic) representations are implicitly degraded as one-sided and ethnocentric, as they have not passed through this elaborate process of synthesis and purification.

While the "neutral article" occupies the center place of attention, all these more subjective or ethnocentric articulations are marginalized by being diverted to the collateral "discussion page" where controversies can go on that may later have visible impacts on the article itself. These "talk pages" are the very for a where memetic evolution processes go on and where everybody can observe how "reality" is constructed as an emerging result of free intersubjective communication. Such constructive endeavours are particularly prominent in the case of unprecedent new unfolding events or developments, where fundamental problems of conceptualization have to be solved.
This was vividly illustrated in the entry "Israeli-Lebanon conflict" in Summer 2006. While an impressively equilibrated exposition has soon be realized as a result of 9000 edits (between July 12th and July 29th), extensive controversies about very subtle terminological points were fought out on the parallel discussion page: whether the process described should be named "conflict" or "war", or whether Israel soldiers have been "captured", "kidnapped" or "abducted".
Some articles may even become temporarily protected from editing until fundamental disputes have been resolved. For instance, the article of "New anti-Semitism" was frozen by administrators in May and June 2006 "until disputes on the talk page have been resolved".[75] The controversy resulted from the fact that he concept "new antisemitism" is used by rightists for defamating the political left: by attributing them a generalized new tendency to take sides against Israel (and even worse: sympathizing with blatantly antijudaist moslems). Leaving the page unprotected would have resulted in a permanent edit fight between rightist who want to upheld this attribution and leftist liberals who deny the justification of the term because they want to draw a clear division line between decrying Israel and defamating the Jews.
"*The problem with this article on new anti-Semitism is that it often isn't clear whether the text refers to a concept, a term, or reality. To take but one example: a concept*

[74] cited in Abid Uallah Jan , 2006b
[75] http://en.wikipedia.org/w/index.php?title=New_anti-Semitism&diff=50525733&oldid=50525704

can't be controversial as such. Only some claim made _about_ the concept can be controversial. Only the claim that there _is_ a new anti-Semitism, where "new anti-Semitism" is understood in a specific sense is controversial. The new anti-Semitism" isn't a single concept. It is a term or phrase. Different people who speak or write about "the new anti-Semitism" or "a new anti-Semitism" attach different meanings to the expression. There are several concepts of "new anti-Semitism". This is one factor which makes this Wikipedia article difficult to write. It isn't like writing an article about Paris or chimpanzees. Because of the NPOV principle we can't single out only one meaning of the term."[76]

While this controversy cannot be avoided of course, it is dealt with in a de-escalating manner by diverting it to the discussion page associated with the article.

In this particular instance, however, protection was lifted after two months without that the conflict has been settled by discussion. Instead, some steam has been removed in the meantime because the leftist opponents to the page have founded a "revenge page" about Israel's alleged "Apartheid" policy.[77]

From such examples, we may draw the unsurprising conclusion that like the UN and other global institutions, the Wikipedia cannot expected to solve persistent global conflicts, but at best to offer some new opportunities for extensive discourse and sophisticated verbal clarification.

6.11 "WP-Notability" as a new Digital Divide

In contrast to printed encyclopedias, the total volume of the Wikipedia is not limited by physical and economic factors. Nevertheless, in proportion to the huge number of edits the WP shows rather modest rates of growth, many new articles are quickly eliminated by admins who think that the topic is "not notable" enough to be included in a repository of universal knowledge; and many enlargements of existing articles become quickly "reverted" because information is judged to be too trivial or beside the point.

The problem with this filtering is that it is not guided by any consensual explicit rules and not executed by a clearly defined decision making body. Anybody can post a request that a specific article should be cancelled, and for any type of intransparent reasons, it may occur that a "majority" for such an action can be found.

Given the rising significance and popularity of the WP as a reference source of information, such filterings become increasingly important because a Wikipedia article may soon be considered as an indicator of relevance, eminence, popularity and reputation - for persons as well as for music bands, art works, localities, historical events and any kind of voluntary association.

"Wiki-worthiness has quietly become a new digital divide, separating those who think they are notable from those granted the imprimatur of notability by a horde of anonymous geeks." (Segal 2006).

[76] http://en.wikipedia.org/w/index.php?title=Talk:New_anti-Semitism&diff=51209794&oldid=51207003
[77] http://en.wikipedia.org/wiki/Israel_apartheid

Currently, such decisions are guided by a multitude of informal criteria that primarily reflect the personal values and preference of the "Wiki mandarins" (mostly between 20 and 30) because they have never been submitted to a public voting or any other legitimating procedure.
"Musicians and bands must have charted on "any national music chart, in at least one large or medium-sized country," or released "two or more albums on a major label or one of the more important labels," or "been the subject of a half-hour or longer broadcast on a national radio or TV network." Politicians must have received "significant press coverage," while sports figures must compete in a "fully professional league" or "at the highest level in mainly amateur sports." (Segal 2006).

It is no surprise that the WP leadership is often inundated by protest emails from the "victims" of such harsh elimination procedures - users who do not know about these rules or who do not agree with them.
Of course such elimination strategies may promote the installation and growth of provincial "minority language Wikipedias" because they provide an at least small forum for many "domestic" personalities and topics that have no chance of being considered in the global English edition.

In the future, we will certainly see much more conflictive action concerning the "rules of notability" as well as on the admission or omission of particular entries. This "politicization" of exclusion/inclusion will certainly raise the need to clarify selective criteria and rules - as well as the procedures dedicated to their constitution, change and specific applications.
Such processes will of course be facilitated by the fact that filtering takes place in full public light. For instance, everybody can consult the daily lists of articles nominated for deletion.
For the first time in history, a broad open discussion about "encyclopedia notability" has been started that has already given rise to intensive debates and detailed - while still unfinished and unofficial - lists of possible criteria. In the guideline page dedicated to the notability of people, for instance, it is stated that among others. Persons with the following characteristics should be included:

- Published authors, editors and photographers who received multiple independent reviews of or awards for their work;
- Painters, sculptors, architects, engineers, and other professionals whose work is widely recognized (for better or worse) and who are likely to become a part of the enduring historical record of that field;
- Persons achieving renown or notoriety for their involvement in newsworthy events, such as by being assassinated.[78]

Such sentences -like many others - illustrate that the Wikipedia sees itself as a publication that relies on reputation that has already been produced ex ante: especially when it is based on consensual mass media judgment or - in the case of lesser known individuals - on different smaller, but mutually independent sources. Of course, this policy does not acknowledge that a Wikipedia entry may itself become a factor in reputation building: especially when the information that this entry exists is propagated by journalists and other potent "multiplicators".

[78] http://en.wikipedia.org/wiki/Wikipedia:Notability_%28people%29

7. Conclusive remarks

The Wikipedia is an extremely comprehensive object to study, because it is at the same time

a) a *cultural artefact* that has to be grasped as a currently existing hypertext structure and can be compared with analogous publications on paper;
b) an *ongoing project* that has to be analyzed diachronically as a constant stream of individual contributions and modifications, and has to be compared with other endeavours of online collaboration (e. g. open source software development projects).

Given its amazing complexity and volatility as a product as well as a production process and organizational structure, it is difficult to achieve any definitive assessment whether it is currently approximating, equalizing or even surpassing conventional encyclopedias on any criteria of quality, or whether it has any chances to continue its spectacular growth (or at least survive on the present level) in the near and more distant future.

In a least controversial functionalist view, nobody will deny that the Internet offers a technological platform particularly instrumental for very large scale collective publication projects, so that the old idea of producing a universal encyclopedia seems better realizable than in any earlier periods of history.

Evidently, online encyclopedia projects imply the possibility
- to realize collaboration among any number and composition of contributors: irrespective of their geographical location or any status characteristics and institutional affiliation;
- to make use of a widest spectrum of highly specialized and volatile expertise whose whereabouts have not to be known in advance;
- to give a voice to knowledgeable individuals who may have no other channels for expression;
- to lower overhead costs to a minimum by relying on "discretionary resources", already existing infrastructure and privately owned “means of production”;
- to allow highly accessible and flexible ways of collaboration without compulsory commitments;
- to ease collaborative writing in a way that not only articles, but even smallest passages and wordings can be collectively produced;
- to create multimedia productions where texts can be amalgamated with pictures, videos and audio files;
- to keep even largest and most complex bodies of knowledge tightly integrated by hyperlinking;
- to keep pace with even very sudden new events and developments by immediate adding new or updating existing entries;
- to facilitate processes of intersubjective knowledge production by providing discussion discussion fora where dissensus can be explicitly expressed and consensus-seeking deliberation processes can be enacted;

- to make encyclopaedic knowledge easily accessible in any individual role contexts and situations: so that it can penetrate any area of everyday culture, human activity and social cooperation;
- to increase the congruence between demand and supply of knowledge: by encouraging recipients to become contributors (“customer-made production”);
- to cope with abuses and other disturbances by relying on “user patrolling” and by creating in a democratic fashion various protective structures, norms and procedures;
- to create separate encylcopedias in all languages and within even tiny ethnicities and cultures almost without any costs and efforts (by simple “forking”);
- to document the whole process of production: by saving (and keeping fully retrievable) all intermediary steps;
- to increase the stock of “public domain” knowledge that can flow freely because it is not subject to copyright or any other proprietary control.

Since he initiated his project in January 2001, Wikipedia founder Jimmy Wales has gone a long way to realize his bold promise to *“distribute a free encyclopedia to every single person on the planet in their own language”*. In the meantime, about 5 million articles in more than 150 languages have been created, and the number of visitors is currently (November 2006) higher than that of any other non-commercial site.

More than that: the Wikipedia has grown not only to be one of the most popular web platforms, but also one of the most authoritative Net Institutions which is daily consulted by thousands of students, teachers, journalists and others who multiply WP knowledge orally or by writing to many other receivers.
This trend is supported by the exploding mass of web information sources that causes most surfers to reduce complexity by confining their regular surfing to about eight to ten Web sites (the equivalent of "anchors" in shopping malls) which they deem reliable, timely, accurate, objective, authoritative, and credible.

Many of these visitors may not be aware that the Wikipedia is the product of anarchic and amateurish procedures; they fully trust the information they find, and they are careless (or lazy) enough to consult additional corroborating sources. As a consequence, the Wikipedia has ever more influence on worldwide processes of knowledge acquisition and knowledge diffusion. Unquestionably, it determines the information transported by innumerable academic papers, magazine articles, written memoranda and oral talks and lectures all over the world.
Given all these striking measures of success (and indicators of unimpeded further growth), there are still reasons for doubt whether the whole project is sustainable because with increasing size and societal prominence, it may become more manifest that it is built on rather shaky grounds.

First of all, the breathtaking popularity of WP contrasts sharply with the fact that it has no secure basis for trust. Its rising status as a first order web knowledge resource site is somewhat free-floating, because there is no correlative emergence of actors to which such far-reaching responsibilities could be attributed: no individuals nor collective bodies that could be made accountable for the information existing or lacking in this amorphous heap of collective contributions (Brandt 2006).
Somewhat similar to democratic votings, the resulting articles have to be seen as the products of anonymous collective processes that derive their legitimacy and accep-

tance form the fact that a set of unknown participants have come to a certain (at least majority) agreement.
Not only is there any lack of professional expertise as a source of authority: users must live with the suspicion that any page they visit has been vandalized recently or is the product of completely uniformed authors. As anybody can edit and modify anything, even people maintaining highly optimistic views about human nature will not be ready to trust fully any article or bit of information, Thus, the Wikipedia is constantly accused of being unreliable, or even more strongly – being just a garbage can filled with trivia and trash.

This lack of trust has grave behavioural consequences, because for several reasons, the Wikipedia is more disposed than conventional encyclopedias disposed to be heavily criticised form many sides:
1) because it is used so extensively and intensively, that errors and quality problems become highly visible within very short time;
2) because users are so heterogeneous that the Wikipedia is confronted with an ever expanding spectrum of expectations – which it certainly cannot all fulfil;
3) because critical users can utter their opinions easily by using the backchannels;
4) because the success of Wikipedia collides with so many deeply ingrained popular beliefs: e.g. the contention that useful performances can only be expected from regularly paid and highly qualified individuals, and that more complex productions can only originate within complex bureaucratic organizations.

Since its inception, the Wikipedia is vehemently denounced by individuals who base their judgement not on extensive empirical research, but just on deductive common sense arguments: As everybody can edit and change articles, there *must* be a high level of vandalism and misinformation; as nobody is paid for fact-checking, it is *certain* that errors remain uncorrected; as experts face the risks that their contributions are subsequently modified or erased by laymen, their motivation to collaborate will *inevitably* be reduced to zero, as nobody can be made liable and legally sought, slandering will spread *without limits*.

Of course, such deductive arguments abound because it much more cumbersome to base judgment on inductive procedures: by selecting a representative sample of Wikipedia articles and analyze to what degree they meet standards of quality, consistency and reliable truth.
While this unprotected exposure is a source of vulnerability, it is on the other hand also an excellent precondition for further learning processes and evolution: e. g. for developing norms and organizational procedures in order to raise the level of linguistic expression and the reliability of information.

The problem to be solved is the following: which *minimal* measures of access control, hierarchical supervision and professional expertise are necessary in order to wipe out vandalism and errors and to ensure reliable, high quality contributions? Instead of relying on a thin elite of professional authors and editors from the onset, the Wikipedia has begun with an extremely open structure which of course can be modified ad libitum according to emerging needs. Its open-ended evolution is based on similar principles as the liberal state where the problem is to find out which minimal constraints on the citizen’s freedom are indispensable in order to prevent public disorder.

It would seem very reasonable to raise the trust in Wikipedia entries by aggregating user judgments: either judgments of experts who evaluate entries within the specialized fields, or general user judgments as it is done in many other Web 2,0 sites today.
Paradoxically, the Wikipedia doesn't lend itself well to such procedures, because any aggregation of judgments has to rely on the premise that the object to be judged remains invariant over time.
The WP's openness for modification has not only the consequence that every user may meet a different article, but that judgments themselves may cause such changes: to the degree that judges correct themselves immediately the errors they see. This second consequence could mean: the larger the number of judgments, the less useful the aggregated judgment, because the object to which it refers has considerably changed.
In a way, the Wikipedia resembles tiny physical quantum objects in the sense that it cannot be observed because observations themselves are causing it to change. Thus, journalists may not find it fruitful to write critical articles about WP on the basis of major errors they have found in it, because only hours after publication, these same errors may have already been eliminated.

A *second* vulnerability stems from the rising eagerness of individuals and organizations to manipulate the Wikipedias contents in accordance with their interests and preferences. The higher the popularity and reference status of the site, the less a politician can ignore when his biography contains embarrassing and compromising facts, and hundreds of supporters, election contest managers and “media advisers” may become active to “correct” the corresponding entries.
Likewise, every corporation will care that its economic performance and the way it treats its employees and customers will be described in a favourable way, and it will mobilize its public relations specialists to do the necessary job. This inherent danger is illustration by the start of “MyWikiBiz.com” in August 2006: a firm who offers to all companies the service of authoring Wikipedia articles about their enterprise and their operations.[79]
While living persons, active organizations and contemporary events may be most hit by such massive interventions, even historical articles (e. g,. about the dead founders of still living religions) may become the center of heated editing contests. Thus, the “resilient” capacities of the Wikipedia may be more profoundly tested in the future, and ever higher numbers of highly motivated and activated “true Wikipedians” may be necessary to cope with such collective attempts of manipulation. While straightforward “vandalizations” often stand out so clearly that they are easily corrected (sometimes even by automated "Vandalbots" without human intervention), such manipulations may be much more difficult to discover, because only very few “patrollers” have the respective knowledge.
Somewhat different dangers arise from the inherent tendencies of “self-accelerating growth". The more popular the Wikipedia, the more individuals will develop an interest to find themselves and their acquaintances as well as their home village and high school and their most preferred movies and music bands adequately represented. Thus, universal encyclopedic knowledge will give way to “multi-particularistic” knowledge serving idiosyncratic interests of families, localities or sectarian movements.

[79] http://mywikibiz.com/ordernow.html

More and more, organized attempts may be made to instrumentalize the Wikipedia for purposes of “self presentation” or to even “kidnap” it for specific ideologies or propaganda purposes.
For instance, in July 2006 the Akron Beacon Journal in Ohio has published an article where readers are invited to write additional Wikipedia entries related to the history of the city of Akron; and detailed technical instructions are provided how articles are generated, edited and changed.[80]
Sometimes, even competitive races are unleashed that may lead to uncontrolled self-escalating editing endeavours:
"The Straits Times *this week reported on the activities of Singaporean Wikipedians who want to ensure that their towns have respectable entries in Wikipedia [4]. Demonstrating the phenomenon known as keeping up with the Joneses, editor Faith Toh declared that she "seethes with jealousy" when she sees that nearby Sengkang has a more expansive article than her home town of Punggol. Toh says that she has now made it her "personal mission" to ensure that Punggol gets a "lengthy, updated entry" in Wikipedia, although she does not know when this "mammoth task" will be completed."*[81]

Such collective “assaults” could well lead to a highly disequilibrated coverage of different geographic regions and locations, and it is not clear how such one-sided hypertrophies could be held in check.
Evidently, they can only be counteracted by cultivating strong, highly explicit and consensual views within the “Wikipedia community” about the scope and limits of “encyclopedic knowledge”: so that all contributions transcending such limits will be rapidly eliminated.

A *third* latent instability arises from the spectacular degree to which the whole project is based on a highly regularized flow of unpaid voluntary collaboration. Such volunteering may well encourage the creation of ever new articles, because many participants may be highly motivated to leave their personal footprints by adding something new. However, the more articles, the higher the subsequent volume of constant maintenance work that has to be carried out by the whole WP community.

The more the Wikipedian diversifies into millions of entries, the less it is possible to allocate the "watching capacities" in a way that all articles are permanently corrected within short time when vandalizations or other forms of degradation occur.
In fact, the Wikipedia community and the administrators maintain highly specific assumption about which sites are very likely to be attacked and which sites are highly important to keep clean. This explains why vandalizations of the G. W. Bush article usually don't survive longer than two minutes, because it is constantly patrolled by policing participants (Kelley 2005).

Usually, such maintenance work is much less motivating because authors find little room for creative performance. Consequently, the probability is very high that the Wikipedia process will soon be slowed down or stopped by simple fatigue; especially

[80] http://www.ohio.com/mld/ohio/news/15133629.htm
[81] Wikipedia:Wikipedia Signpost/2005-05-23/In the news
http://en.wikipedia.org/wiki/Wikipedia:Wikipedia_Signpost/2005-05-23/In_the_news

when alternative projects that allow more creative expression are absorbing the volunteer's attention.
"We remember another volunteer-based effort to help organize web sites, The Open Directory, and to put it mildly, DMOZ did not turn out to be what many had hoped for. It's human nature. People are often ready to move on to the next big thing, especially when they volunteer. If that happens, will Wikipedia be able to maintain the more than one million (and by that time many many more) entries?"[82]

Unhappily, the transition to fully paid staff is no viable alternative, because thousands of employees would be necessary to carry on all volunteering activities.
Therefore, stagnation and decline will only be prevented when active participation is stabilized by either by very tight internal community controls or by exogenous institutionalized norms. For instance, schools and universities could oblige their students to engage in "Wikipedia maintenance work" for acquiring some their points and grades; scholars may accept the informal responsibility to look constantly after the WP entries most akin to their specialized field; and even national or worldwide associations may emerge just for the purpose keeping "their" Wikipedia sections up to date.

In addition, the strict anonymity of contributions may in the long run be disfunctional because collaborators see no chances of getting any personal reputation (Ciffolilli 2003).As many articles are in their major parts written by single contributors (or very small groups of them), it would be possible to make at least these names visible - in contrast to all the smaller contributors who have only added words, commas, references or links.

Some of these problems are aggravated by the fact that the Wikipedia is not a "Net Encyclopedia" in its fullest sense, but an intermediary product that still clings to some premises and constraints of the printed paper era. When seen in isolation, it is certainly impressive how radical WP has implemented new online technologies in literally all its activities. When looked at as a component of the larger Internet, however, it is conspicuous that it has still problems to define its place and hesitates astonishingly to make full use of the potentialities of the World Wide Web.
Like a conventional multivolume encyclopedia that can be put on a library shelf (and like the EB or Encarta on CD-Rom), it still aspires to remain a relatively closed, self-contained universe: so that visitors have just to navigate *within* the site to find all necessary information. As explained above, this self-isolation may be understood as a correlate of community building and collective identity formation. It is expressed in the emphatic assertion that the WP should not be a "web directory"[83], and in an "external hyperlink paranoia" (see 6.6) for keeping visitors away from propaganda or commercializations. However, this "isolationist" stance ignores that the WP is just a node within an ever expanding web of knowledge resource sites, and that unlike the community-oriented "Wikipedians" who want to perfect their mighty cathedral, typical visitors are quite indifferent whether they find the desired information within the Wikipedia or on any other accessible site.

[82] Anonymous comment: http://www.resourceshelf.com/2006/06/17/ny-times-reports-wikipedia-makes-some-revisions-to-its-own-editorial-policy/

[83] http://en.wikipedia.org/wiki/WP:NOT

The Internet makes it fundamentally easy to corroborate any kind of information by searching for second or third opinions in different websites. As a consequence, the idea of the WP to be right in all matters is fundamentally flawed: its a relic of the printing age where having the EB usually excluded the possession of alternative encyclopedias, so that there had to be complete trust in exactly this single publication. Thus, for the WP, the way to perfection does not mean to become error-free, but to make available gateways for corroborating information: e. g. by adding hyperlinks to more specialized and professionalized sources.

As it is used a portal site by so many users, it should accept its responsibility to be exactly such a gateway: by guiding users from the more fundamental information provided in its own articles to deeper and more detailed information on other sites.
By setting links to the primary sources from which it has drawn its information, errors would also become less consequential (and therefore: more tolerable), because users would be enabled to make independent checks (Benkler 2006: 218).

Of course, this would imply that Wikipedia editors accept the duty to evaluate and select such external sites: so that the Wikipedia would not just be an encyclopedia, but also an encompassing directory: a universal gateway to human knowledge by connecting to all sorts of high-quality informational resources. More than that: it would constantly adjust its mission in relation to complementary sources arising on the WWW: carving out an ever more specialized and more precisely defined niche.
Only by stripping off all aspirations of isolative self-sufficiency, the Wikipedia will burn its mental bridges to the old age of printing and become a true contemporary of the Internetted Digital Age.

Finally, we may speculate that the most profound effect of the WP is associated with a much more encompassing process it has set in motion: the rapidly proceeding "wikification" of the World Wide Web.
On the one hand, there has already been a rapid multiplication of Wikipedias in almost all human languages On the other hand: there is an emergence of specialized wikis centering on particular topics. Such processes have been catalyzed by the foundation of the "Wikicities" site which offers the free MediaWiki" software to everybody who wants to install his own Wiki: e. g. on Star Treck, Harry Potter, Basketball, genealogy or quit smoking.[84]

As exemplified by "Beijingology" page[85] which aims to collect all available knowledge on this major Chinese city, geographical entities like countries, provinces or municipalities may be particularly prone to become attractors for wiki-guided knowledge aggregation, because such knowledge is very multifaceted and distributed to large and constantly changing variety of residents, visitors and external observers.

While such proliferations may weaken the central encyclopedia endeavours by diluting work capacities on a multitude of smaller projects, they have themselves a centralizing impact: e g. by convincing former authors of individual websites to pool their endeavours.

[84] http://www.wikia.com/index.php/Wikicities
[85] http://beijing.wikia.com/wiki/Main_Page

Thus, the psychology Wiki founded in January 2006 has expanded so quickly that already at the end of the same year, it has become one of the most comprehensive psychology sources on the Net (with about 22000 pages).[86]
While the general Wikipedia still functions as a model and paradigm, such specialist Wikis may have better chances for survival and continuous upgrading because most of their contributors may possess a rather high expertise. Starting in Jan. 2007, these services have been expanded by openserving.com which offers also free bandwidth and storage space to all Wiki holders.[87]

It is evident that apart from the encyclopedic project, the Wikipedia has now kicked off a far-ranging process of "Wikification" that may easily spread over major parts of the Internet subsystem by giving rise to thousands of knowledge accumulation projects united by using the same standardized Wiki software as well as by dense mutual hyperlinking and uninhibited content transfers (based on "free license").

[86] http://psychology.wikia.com/wiki/Main_Page
[87] http://www.openserving.com/

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