

11 Online Motivational Factors: Incentives for Participation and Contribution in Wikipedia

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Cyberspace has introduced new and intriguing means for knowledge sharing as well as new structures of mediated knowledge-building communities. Considering the various forms of online communities, it should be difficult to overstate the significance of Wikipedia as a landmark in building communal knowledge repositories.

Wikipedia is an online collaboratively written encyclopedia. It has unique aspects of users' involvement in the production of content and its function as a community. In less than five years of existence, Wikipedia has acquired both avid advocates and ardent adversaries. Although there have been some public and academic debates about the quality of its content, as the rapid growth of its articles and numbers of active users (Wikipedians) continues, most people agree that at least the English version of Wikipedia is approaching critical mass where substantial content disasters should become rare. Wikipedia's existence and success rely on users' inputs. Our chapter focuses on Wikipedians' incentives for contributing to Wikipedia. The popular observation is that Wikipedia only works in practice. In theory, it can never work. How does Wikipedia mobilize the levels of participation that make it "work in practice"?

Wikipedia's growth, from the time of its foundation in 2001, has been impressive in all conceivable dimensions. Expansion metrics have accelerated in terms of volume, numbers of articles, visitors, and percentage of contributors. There are, by the time of this writing, 250 language editions of Wikipedia. The English-language version is the largest. It contains more than two million articles. The German-language version has more than half a million articles and the French, Polish, Japanese, Dutch, Italian, Portuguese, Swedish, Spanish, Russian, and Chinese versions each boast over 100,000 articles.

According to Alexa.com traffic rankings, Wikipedia is among the top fifteen most visited sites. Google "top searches" of 2006 report that "Wikipedia" and "wiki" are tied for the tenth position in the list of most searched words. Furthermore, Wikipedia content is widely replicated on other websites (e.g., Answer.com).

In trying to understand contribution dynamics, we focus on the individuals who write Wikipedia, the so-called Wikipedians. The number of Wikipedians continues to rapidly grow. The English Wikipedia alone has exceeded 3 million registered users. Though these numbers might be biased in many ways (multiple registrations), Wikipedia statistics indicate (Figure 11.1) that currently

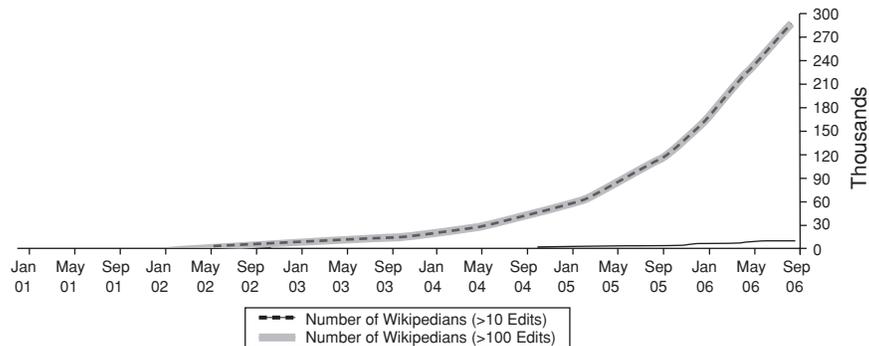


Figure 11.1. *Numbers of Wikipedian. Based on <http://stats.wikimedia.org>.*

there are more than 300,000 users in the various Wikipedia editions who have contributed at least ten edits, and the numbers grow exponentially by 5–10 percent a month.

What is Wikipedia?

Wikis are online, web-based collaborative writing environments. Wikipedia is probably the most famous implementation of wiki-based platforms. There are currently numerous experiments in wiki-based environments. The experiments include knowledge management solutions, academic textbooks, Wiktionaries, WikiBooks, WikiQuotes, and more (for an updated list see mediawiki.org, which distribute free wiki-based software originally written for Wikipedia). Wikis in general and, specifically, Wikipedia embody and experiment with the utopian notions associated with Internet group behavior. Not surprisingly, both the resulting quality of the content of wikis and the equity in contribution efforts are controversial.

Wikis are group-editing tools that allow the formation and maintenance of online linked webpages, created by a group of users. The term *wiki* originated from the Hawaiian languages wherein “wiki-wiki” means fast and refers to the content as well as the software used to manage these pages. In a wiki, all users are potential authors and editors. To modify a page, a user simply clicks on an “edit page” link, changes the text in a text area, and submits the changes. Wiki platforms allow anyone (registered or anonymous) to add, change, or delete content on any of the pages (Leuf & Cunningham, 2001).

At the core of this chapter stands Wikipedia, an online wiki-based encyclopedia. Contrary to encyclopedias published in other formats, professional editors do not review Wikipedia content before material is published; instead, visitors to the online site monitor its content. Furthermore, individuals who have interest in the specific topic may purposefully follow recent changes and traffic (history pages) or engage in a conversation with other users on the subject (discussion pages).

Wikis support hyperlinks and have a simple text syntax for creating new content and internal crosslinks. Wiki is unusual among group communication mechanisms in that it allows the organization of contributions to be edited in addition to the content itself. Like many simple concepts, “open editing” has some profound and subtle effects on Wiki usage. Allowing everyday users to create and edit any page in a website is an exciting notion because it encourages democratic use of the web and promotes content composition by nontechnical users (Emigh & Herring, 2005).

Studying Wikipedia

Wikipedia has captured the attention of researchers across a variety of disciplines. There are several dynamic collections of wiki-research-related bibliographies available online. At least two yearly international conferences focus on Wikipedia (Wikimania: proceeding available at <http://wikimania.wikimedia.org>; and Wikisym: proceeding available at <http://www.wikisym.org>) that provide a variety of rich studies of the content, the process, and the behavior of users and creators. Much of the research attention is devoted to the technical aspects of the wiki database and interaction features. Table 11.1 summarizes some of the major fields of interest in Wikipedia research and provides pointers to relevant sources. Wikipedia is self-aware to an extent and documents studies about itself and its users on a webpage titled “Wiki Research Bibliography” (http://meta.wikimedia.org/wiki/Wiki_Research_Bibliography). This page contains many other links (Wikipedia’s pages and external links) to webpages that continually update wiki-related research. The material in Table 11.1 goes beyond sources mentioned in the Wikipedia self-reference at the time of this writing. Table 11.1 focuses mostly on the social aspects of Wikipedia creation and use.

As indicated by Table 11.1, research has focused on Wikipedia (content quality and authority) and its technological structure and users (Wikipedians motivations, community aspects, and learning process). Cifolilli (2003) describes Wikipedia as a community. He discussed early views on the processes of reputation within it and searched for reasons of its success. Lih (2004) analyzed citation of Wikipedia content in the press. Emigh and Herring (2005) have studied Wikipedia’s functionality as an online encyclopedia. We will elaborate on some of these and other studies later in this chapter. Surveying Wikipedia-related studies, we find only a limited scope of studies that mention incentives for contributing content and other participatory elements. Why do people make the effort?

Wikipedia is probably one of the most salient examples of user-generated content. The notion of peer-produced content, in a “Wisdom of Crowds” (Surowiecki, 2004) setting, has captured both the imagination and headlines in recent scholarly and popular discourse of online behavior. Some

Table 11.1. *Fields of interest in research on Wikipedia*

Field of study	References
Editorial and authorship consideration	Emigh & Herring, 2005; Miller, 2005
Content quality	Chesney, 2006; Lih, 2004; Stvilia, Twidale, Gasser, & Smith, 2005;
Sharing and collaborative Knowledge building	Lih, 2004; Subramani & Peddibhotla, 2003
Learning	Bruns & Humphreys, 2005; Forte & Bruckman, 2006; Ravid, 2006
Motivation to contribute	Forte & Bruckman, 2006; Nov, 2007; Rafaeli, Ariel, & Hayat, 2005; Schroer & Hertel, 2007
Wikipedians typologies	Bryant, Forte, & Bruckman, 2005; Gaved, Heath, & Eisenstadt, 2006; Majchrzak, Wagner, & Yates 2006
Wikipedia as a community	Benkler, 2006; Ciffolilli, 2003; Voss, 2005
Aspects of wiki technological features	Gabrilovich & Markovitch, 2007; Holloway, Bozicevic, & Börner, 2005; Viégas, Wattenberg, & Dave, 2004

marketing-oriented literature even terms the phenomena one of “prosumerism,” a confusion or amalgam of the provider and recipient along the value creation chain. Our understanding of sociological and psychological aspects of Wikipedia should, therefore, investigate motivations to participate.

Wikipedia Contributors

Perhaps the single most important insight about contributors to Wikipedia is that, in spite of their popular image and in possible conflict with some of the “democratic” rhetoric, they are neither equal nor uniform. Contributors to Wikipedia call themselves Wikipedians. Wikipedians are not all made in the same mold. Some register formally on the site, while most seem to remain semianonymous, identified only by IP (Internet Protocol) number. Even IP-only users are stratified according to whether they visit Wikipedia from the same (repeated) IP or are completely sporadic and unknown. Among those who decide to register, there are fine gradations of status, role, and hierarchy. Some Wikipedians are known to the world and their colleagues through pseudonyms, while others disclose their identity completely, revealing their name. Some Wikipedians maintain a user page, and some provide links to personal pages offsite, outside of Wikipedia. In the interactions among Wikipedia, authors, and editors, the degree of self-disclosure of participants is an important determinant of intimacy, sense of belonging and camaraderie,

and the nature of interaction, as will be discussed later. The content on individual users pages, and the commitment made by the more deeply involved Wikipedians to particular areas of content reflect heavily on the continuity of coverage and community action. Thereby, identification is likely highly tied to motivation.

Gaved, Heath, and Eisenstadt (2006) suggest a typology of wiki users by the nature of their activity or type of contribution. Their classification is based on a survey of users of a wiki-based guide. The categories of the typology include three types: placeholders, completers, and housekeepers. *Placeholders* are users who prefer making many sparse entries (ensuring some coverage on every entry). *Completers* prefer to make fewer but more complete entries. *Housekeepers* enlist in the service of ensuring the completeness of entries and crosslinks. Another categorization offered by Majchrzak, Wagner, and Yates (2006) surveyed corporate Wiki users. They found a significant difference between the factors that motivated “synthesizers” and “adders” in contributing a corporate wiki. Synthesizers were concerned more with their own reputation and their effect on the wiki-related process, wiki users, and the whole organization. In contrast, Adders were more utilitarian and interested in completing immediate work responsibilities and less concerned with their own reputation.

In a much-cited blog on the topic, Bosworth (2006) suggests that despite Wikipedia’s claims to egalitarianism the motivations to contribute in a wiki community constitute a two-stage reward system dividing between “new” (regular) users that gain small but satisfying rewards for basic participation and “fanatics” (administrators) who get the larger rewards through competition for special status. Bosworth claims that this reward system works in every Wikipedia page:

Wikipedia self-selects for people who are obsessive about various subjects or just editing in general, as in every case the person or set of people willing to hammer their edits obsessively will win power over the page, and thus the reward of participation.

Virtual communities experience serious problems in sustaining the community due to lack of contributions. Although there is a lot of enthusiasm over online communities, many, or even most, fail. The virtual environment is overloaded with empty communities or communities where many of the participants are “lurkers” or “free riders” (Adar & Huberman, 2000). Furthermore, even when virtual communities do persist, it is usually only a small ratio of the more vigorous contributors that keep the community active. Many studies find that cyberspace phenomena distribute following power laws, such as Pareto distribution and Zipf’s law of participation in online community (e.g., Lada & Bernardo, 2002).

Power law distributions have been observed in diverse phenomena (Axtell, 2001; Comellas & Gago, 2005; Gabaix, Gopikrishnan, Pelrou, & Stanley, 2004). In relation to online communities, Adar and Huberman (2000) found that on Gnutella (a peer-to-peer service) 10 percent of users supply 87 percent

of all content. Similarly, Lakhani and Hippel (2003) found that only 4 percent of the members of open-source development communities provide 50 percent of answers on a user-to-user help site. Peddibhotla and Subramani (2007) refer to the notion of “critical mass,” indicating the disproportionate contributions of the minority of contributors to public document repositories.

The distribution of activity on Wikipedia is in line with that reported for other virtual communities. The founder of Wikipedia reported that 2.5 percent of the users contribute 80 percent of all the content. Furthermore, 50 percent of the content is generated by only 1 percent of the contributors (cited in Tapscott & Williams, 2007). Benkler (2006) looking at the growth in Wikipedias’ contributors writes:

The shift in strategy toward an open, peer-produced model proved enormously successful. The site saw tremendous growth both in the number of contributors, including the number of active and very active contributors, and in the number of articles included in the encyclopedia. (p. 71)

Thus, the numbers reported by Benkler also indicate a power law distribution; for example, in June 2005, there were 48,721 Wikipedians who contributed on at least ten occasions, 16,945 “active contributors” who contributed at least 5 times a month, and only 3,016 “very active” Wikipedians who contributed more than 100 times during last month. The ratios of these numbers remain fairly stable over the years. The vast audience of users is even larger. Any examination of motivations needs to stay aware of the overarching power law reality: the whole universe of contributors forms only a small percentage of those who use the system.

We propose that Wikipedians’ participation should be examined from several distinct perspectives:

1. Professional versus nonprofessional participation
2. Constructive, confrontational, and vandalistic participation
3. Continuous versus one-time participation
4. Anonymous versus identifiable participation
5. Content contribution, community involvement, and (silent) participation in the form of lurking.

Some of this work has already been done in other cyberspace-related studies. For example, Joyce and Kraut (2006) on predicting users’ continued participation in newsgroups; Kalman, Ravid, Raban, and Rafaeli, 2006 on silence in computer-mediated communication; Soroka and Rafaeli (2006) on online lurking behavior. As we will detail, early examinations of Wikipedians’ motivations have taken aim at the psychological, sociological, community-oriented, economical, gratificational, and interactional aspects of potential sources for motivation. In the following, we will review the work in each of these areas to date.

Motivational Factors Research

The study of human motivations has a long tradition in behavioral sciences. Cofer and Appley (1964) surveyed the interest in motivational phenomena as a research field and suggest it can be dated, as a modern construct, to Darwin and Freud. Maslow's (1970) widely cited work proposes five levels of needs that drive human activities, ranging from physiological needs to the need for self-actualization. Is participation in Wikipedia solely self-actualization?

Deci (1975) underlines a distinction between "intrinsic motivation" and "external rewards." Although the first are psychological factors that include the desire for competence and self-determination, the second includes factors such as direct or indirect monetary compensation and other's recognition. Based on these observations, Hars and Ou (2001) also propose a distinction between motivations that are rooted in the psychology of the individual (internal factors) and external factors (rewards) that originate from the environment, which will be used as a basis for identifying potential factors that lead programmers to participate in open-source development. Thompson, Meriac, and Cope (2002) indicate that extrinsic rewards might actually decrease intrinsic motivations. Thus, users who were never offered extrinsic rewards were more self-motivated.

Theories and models from diverse disciplines address active and passive participation in virtual communities. This chapter will highlight approaches that might explain motivations to contribute on the part of Wikipedians.

Several theories rely on psychological explanations, such as the humanistic perspectives, to define what causes our intrinsic needs or motivations to operate. Various social psychology explanations such as group dynamics also try to explore the effect of motivations on online community (Ling et al., 2005). Sociological explanations and especially social network analysis models are another way to capture the reasons for contribution and participation in a community. Media studies have a long tradition of uses and gratifications perspectives that can be easily applied to online community (Sangwan, 2005). Finally, searching the incentives that users have in participating in and contributing to a community gives rise to some economic explanations (Kollock, 1999; Raban, Ravid, & Rafaeli, 2005).

Psychological Explanations for Contributing to an Online Community

From a psychological perspective, Joyce and Kraut (2006) found that users who contribute more content to an online community were more likely to repeat their participation in that community. They suggest that some users are self-motivated to write more in general, while some users who invest time

or effort in the community continue to participate in it to maintain their self-presentation and to avoid cognitive dissonance about their reasons for investing their time in that community. Joyce and Kraut suggest it is likely that newcomers' interaction with a group (initial postings followed by others' responses) will be a first step in their commitment to the group. Ling et al. (2005) report that users will contribute more to the community if they believe that their contributions are important to the group's performance, if they believe that their contributions will be identifiable, and if they like the group they are working with.

According to a functionalist perspective in psychology, individuals perform certain activities because they serve one or more functions. Snyder and Cantor (1998) suggest four clusters of functions:

1. Value-expressive: a way of expressing one's values about altruistic concern for others.
2. Utilitarian: rewards from the person's external environment; a person might contribute to a repository to receive monetary or other rewards.
3. Social adjustive: doing a certain thing may lead an individual to better fit in with the peer group.
4. Knowledge: by engaging in particular task, an individual might have a new learning experience and be able to exercise one's knowledge, skills, and other abilities.

Is it possible that Wikipedia contributions are explained simply through pure altruism? From a sociological perspective, Kollock (1999) is unequivocal: "literal altruism" is a rare phenomenon. In replacement for the negated literal altruism, Kollock suggests several possible motivations for contribution to online communities among them: anticipated reciprocity, sense of efficacy, and attachment or commitment. *Anticipated reciprocity* refers to person's motivation to contribute in the expectation that one will receive useful help and information in return. A related factor to anticipated reciprocity is users' identity persistence when record of past actions and contributions is kept and attributed to the contributor. Another related factor to anticipated reciprocity is well-defined group boundaries. Both identity persistence and group boundaries are factors of the anticipated reciprocity as the online community eventually balances itself. Community members avoid those who never give or conversely make an effort to help those who have contributed in the past. A *sense of efficacy* refers to a person who contributes valuable information to an online community because influencing this community may support her own self-image as an efficacious person. *Attachment or commitment* to online community refers to a person who contributes to the group when individual and collective outcomes are merged or somewhat balanced.

Cifolilli (2003) distinguishes between personal and social motivations of Wikipedians. Self-motivations involve satisfaction, efficacy, and intrinsic drive to acquire knowledge. Social motivations involve a desire to take part in the

production of a collective good, a need for belonging, and 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. Following Rheingold (1993), Kollock also suggests that users contribute to get prestige in the community. Building community prestige is a key motivation of individuals' contributions to the group. The first stage in building one's reputation is quite simple in Wikipedia. The "history" function allows exploration of previous versions of each article. Through history one can and many do trace the authors. Cifolilli (2003) argue that Wikipedians' reputation correlates with the number of their contributions. Erickson and Herring (2005) defined the notion of "persistence conversation" to describe a human-to-human interaction carried out over computer networks and which, unlike face-to-face conversation, leaves traces. As will be discussed later, we suggest these conversations should be examined as Wikipedia's enabled interactivity.

Substitutes for Economic Payback?

Contributing content or other acts of participating in Wikipedia are not directly remunerated. Rewards, if any, are rarely tangible. Thus, most theories and expectations rooted in a traditional economic perspective have less of a direct relation to the examination of motivations to contribute to knowledge repositories such as Wikipedia. In more directly and monetarily rewarded contexts, such as the Google Answers site, for example, Rafaeli, Raban, and Ravid (2005, 2007) found that higher-priced and better-tipped responders were more likely to participate. However, even in the presence of specific and salient monetary rewards, the economic incentive was strongly moderated by social variables. Higher participation was documented to be a function of an interaction between money and social reference. Wiertz and Ruyter (2007) investigated why customers are willing to contribute to firm-hosted technical support online communities. They, too, found that knowledge contribution to these communities is strongly influenced by a customer's tendency for online interaction, feeling of commitment to the community, and the perceived informational value. These three incentives are mentioned throughout this chapter.

Subramani and Peddibhotla (2003) describe the content contributed to a repository as a public good since once it is given to a person it is cheap or free to provide to everyone else and supposedly

a rational person will contribute to a repository only if he gets incentives to compensate for his effort. More importantly, such incentives will work only when the person is recruited for the task. In public knowledge repositories, however, there is no active recruiting. Moreover, because of the large number of participants, it is not possible for a central authority to monitor each individual and provide tailor-made incentives to induce contribution.

The intervening and moderating force of social variables above the obvious role of private interest appears here too.

Tapscott and Williams (2007) claim that the transition from the industrial to the information-based economy changed more than the way we produce and circulate. Social relations around the co-production of content and the relational structure surrounding it evolve into “wkinomics.” Peer production is the key element of such economic environment, and people contribute without any direct payment for diverse motivations. Tapscott and Williams also suggest three conditions for this kind of peer work to perform well:

1. *Cost for the contributors is low.* With Wikipedia, for example, production of information and knowledge building is central. There are widely circulated critiques of Wikipedia’s user interface. These critiques suggest that learning the editing procedures (and their continuing developments) of Wikipedia is becoming a complicated task for the average users (see <http://www.wikitruith.info> for multiple criticisms). If these critiques prove correct or gain momentum, it will mean that the cost for contribution is raised, thus expected participation may decline.

2. *Tasks are “chunked out into bite-size pieces”* (Tapscott & Williams, 2007, p. 70). In other words, minor editing is available and boosts participation because the threshold for initial participation is low.

3. *Low cost of integration and quality control.* Indeed, wiki technology is based on volunteer administrators and requires relatively little overhead.

Because contributing to Wikipedia is not explained by immediate economic reward, we should search Wikipedians’ incentives through the subjective value of information. Contrary to other goods or services, once information is produced, its replication is almost costless, and it cannot be consumed or spent (Bates, 1989; Raban & Rafaeli, 2007; Shapiro & Varian, 1999). Bates (1989) argues that the value of information has a paradoxical nature. The value of information lies in its content and structure; one cannot evaluate information without using it, so to evaluate it, one should be exposed to it. However, after being exposed to it, your evaluation may change. Similarly, Shapiro and Varian (1999) argue that information is an “experience good,” and therefore, its value is revealed only after consumption. Nevertheless, there are some similarities between information and other resources, as in the case of the principle of the diamond-water paradox that highlights the nature of subjective evaluation, where water is available, people value diamonds highly, and while in an arid desert, people would value water more highly than diamonds.

Ahituv and Neuman (1986) divide studies of the value of information into three approaches: the normative value approach, realistic value approach, and subjective value approach. The *normative value approach* proposes that individuals (always) have some preliminary knowledge about the occurrence of events that are relevant to a specific decision. In that sense, an individual assigns objective or subjective probabilities to the information because of his or her prior knowledge. In a synthetic environment with given parameters, this

knowledge should help the individual make perfect evaluations of information. However, the Wikipedia environment does not offer its contributors this kind of stability. The *realistic value approach* usually includes the implementation of an experimental research, before and after design. This approach examines the revealed value of information by measuring the effect of new information on the outcomes. Using this approach, one must assume the measurability of all associated variables. In Wikipedia, evaluating information relying on this approach is suitable only in the case of organized participation, such as students contributing to Wikipedia as a required assignment. We find the third approach to be more promising when studying Wikipedia. The *subjective value approach* asserts that the value of information is a reflection of the individuals' impression of information (e.g., Raban & Rafaeli, 2007; Rafaeli & Raban, 2003).

The behavior of individuals who contribute to open-source programs might shed a light on the economical perspective, which is relevant also to Wikipedians. Although the most open-source programmers are not compensated for their contributions directly, they may receive indirect rewards by increasing their marketability and skill base or selling related products and services. This might be the case for some Wikipedians who contribute to receive external rewards. Hars and Ou (2001) suggest, based on a survey of programmers, that those who work on open-source products and follow open-source and GNU software rules may view their participation as an investment from which they expect future returns:

1. Revenues from related products and services: Open-source software provide many opportunities for selling related products and services.
2. Human capital: Open-source programmers may also participate in open-source projects to expand their skill base.
3. Self-marketing: Programmers may also regard working for open-source software as an effective way to demonstrate their capability and skillfulness in programming.
4. Peer recognition: Many open-source programs desire fame and esteem, which is associated with future returns.
5. Personal needs: Many open-source projects were initiated because a programmer had a personal need for specific software.

Wikipedians' Gratifications

Another productive approach for examining Wikipedians' motivations is located in the results of their actual activities. What are the gratifications they seek or obtain? Relying on psychological humanistic approach (such as the work of Maslow and Rogers), media scholars have been developing an extensive literature about a user-centered approach and theoretical tradition named "uses and gratifications" (Katz, Blumler & Gurevitch, 1973; Ruggiero, 2000). Combined with a sociological perspective and later with critical studies, the original definitions of the uses and gratifications theory suggested that

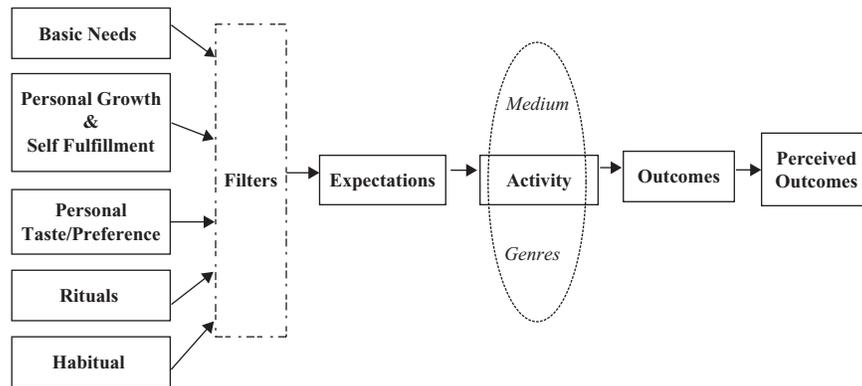


Figure 11.2. *Uses and gratifications comprehensive model.* Source: Ariel, 2005.

members of the media audience are not passive in their relations with the media. On the contrary, audience members seek specific media and content in active ways to obtain specific gratifications (Katz et al., 1973). The new platforms offered by cyberspace emphasize the relevance of this approach for examining users motivations in virtual environments (e.g., Grace-Farfaglia, Dekkers, Sundararajan, Peters, & Park, 2006; Jung, Youn, & McClung, 2007; Lin, 2002; Sangwan, 2005; Stafford, Stafford, & Schkade, 2004).

Traditional studies of uses and gratifications used five generic clusters of needs that media could fulfill: cognitive, affective, personal integrative, social integrative, and diversion needs (Rubin, 1986). Let us elaborate each of these clusters:

1. Cognitive needs represent the intrinsic desire for information acquisition, knowledge, and understanding.
2. Affective needs related to emotional experiences and intrinsic desire for pleasure, entertainment, and aesthetics.
3. Personal integrative needs that derive from individuals' desire to appear credible, be perceived as confident, and have high self-esteem.
4. Social integrative needs are affiliation needs where the individual wants to be part of a group to have a sense of belonging.
5. Diversion needs, which relate to the need for escape and diversion from problems and routines.

Although these motivation clusters serve as basic guidelines for the uses and gratifications study of any medium, surveying the literature reveals a more complex model which is illustrated in Figure 11.2.

Obviously, a medium such as the Internet and a context such as Wikipedia have more two-way flows and more complex types of use, motivations, and gratifications. Let us describe how the research of Wikipedians' motivational factors for contributing content to Wikipedia can be examined according to the

model presented in Figure 11.2. Motivations to contribute to Wikipedia might originate from five factors:

1. Basic needs: In rare cases, overly committed and involved Wikipedians might need their activity in Wikipedia as it maintains their own notions of self. These cases should be considered pathological or unhealthy and are probably not the norm. Contribution to Wikipedia might be very attractive but is probably only rarely a response to a basic need.

2. Personal growth and self-fulfillment: Fulfillment of Wikipedians' gratifications such as the need to belong to a community. This gratification is probably fairly widespread. Does Wikipedia provide self-actualization? Does it do so even in anonymous settings?

3. Personal taste or preference: Wikipedians who contribute because they enjoy performing activities in Wikipedia (editing, discussing, or voting on subjects). The degree to which active behavior on Wikipedia is intrinsically rewarding should be of great interest for further research. It is here that the most promising and long-lasting innovation may reside.

4. Rituals: Wikipedians who perform activities in Wikipedia as part of ceremonies and rhythms of their personal life. To what extent is the contribution to public knowledge repositories woven into day-to-day practice for some people, as, for instance, reading newspapers, participating in online chat and forums, or calling up the local talk radio show might be for others. Initial survey evidence suggests that this is the case, at least, for early Wikipedians (Rafaeli, Ariel, Hayat, 2005).

5. Habitual: Wikipedians who contribute as a routine, without thinking or acting because of a specific explicit incentive.

As can be seen in Figure 11.2, these five factors are transformed into Wikipedians' expectations toward the outcomes of their performance in Wikipedia. "Filters" are external and internal effects on the formation of expectancy, such as community norms or time limitation, which can strengthen or weaken ones' motivation. The actual contribution activity is placed within medium and genres conventions. Thus, active Wikipedians might become administrators and a novice Wikipedian might perform nonnormative actions in editing an article. The outcomes of Wikipedians' contribution in Wikipedia are for the most part very visible to all. Anyone can examine name and date of edit, user statistics, and the like. Nevertheless, the outcomes perceived by Wikipedians themselves are situated in a feedback loop and thus serve as the real generators of the motivational process.

Wikipedia as a Knowledge-Building Community

An important factor of incentives for participating and contributing content to Wikipedia is related to its affordance through the collaborative

process of knowledge sharing and knowledge building. Similar to open-source projects and other document repositories, being an active user in Wikipedia means taking part in a mutual learning process.

Zhang and Feng (2006) examined Wikipedia as a case study of motivations for contributing open-source software. They suggest that open-source software developers might have an intrinsic motivation rooted in the fun of programming and learning. Based on textual analysis, their results indicate that the collaboration in the Wikipedia process enhances incentive to contribute.

Peddibhotla and Subramani (2006) propose that knowledge sharing by contributing to a document repository (e.g., Wikipedia) is a form of prosocial behavior (Batson, 1998) because individual contributions lead to benefits for others whether there are any benefits for the contributor himself. Subramani and Peddibhotla (2003) examine users' personal written profiles in a public repository of product reviews as a source of data to glean their motivations. They propose four motivations for users' contribution to document repositories: (1) altruism versus (2) utilitarian motives, (3) reciprocity, and (4) knowledge motive. Expression of altruism refers to users who share their experience with a product, recommending or criticizing products with the goal of saving other readers' time or helping them with a purchase decision. Subramani and Peddibhotla consider in contrast the utilitarian motives. These involve obtaining a material benefit in return for contributing. Benefits could be tangible (such as free products or money) or reputational (which might lead eventually to tangible benefits). Similar to Kollock (1999) they found reciprocity as a motive for contributing document repositories. Reciprocity refers to individuals who wrote reviews as a form of reciprocation for the benefit they had received from other reviewers in the past. The fourth motive is knowledge in which the activity of contributing serves as a self-cognitive incentive such as improving writing skills, organization, and clarification of thoughts.

In a later article, Peddibhotla and Subramani (2007) suggest differentiating "other-oriented" and "self-oriented" motives. Whereas the other-oriented motives refer to social affiliation, altruism, and reciprocity, the self-oriented motives refer to self-expression, personal development, utilitarian motives, and enjoyment. Thus, should we consider contributing to Wikipedia (as a form of knowledge repository) to be a self- or other-oriented motive?

Rafaeli, Ariel & Hayat (2007) discuss Wikipedia as a virtual knowledge-building community:

Wikipedia is a constant work-in-progress, a method for creating and sustaining collaborative knowledge building, and a metaphor for growing and accumulating knowledge in a social sphere.

Thus, Wikipedia encompasses more than just plain information as its tool set contains meta-data and meta-information. Furthermore, users' ability to generate diverse discussions (not just encyclopedia related content) and

contextualized pages with their archives (history page) position Wikipedia as an interactive, collaborative authoring tool.

Wikipedians' Sense of Community as a Motivator

One of the strongest motivations to participate and contribute to a community is users' sense of community. Echoes of this insight were already mentioned earlier and in work by Kollock (1999) and Majchrzak et al. (2006). McMillan and Chavis (1986, p. 9) define "sense of community" as

a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together.

Wikipedia defined itself as a community, and special spaces in Wikipedia are dedicated for communal activities. The rhetoric of community is to be found everywhere. Do the readers pick up this rhetoric as a call for action? Rafaeli, Ariel and Hayat (2005) found some confirmative evidence of users' sense of community in Wikipedia in their survey of a selected sample of highly active Wikipedians. The data for this study were collected using an online web questionnaire, which was posted in the "community portal" of the several Wikipedias (English, German, Italian, Arabic, and Hebrew). Results revealed various aspects of communal perceptions (e.g., teamwork) and activities (multiple relations inside and outside Wikipedia boundaries).

Using terminology reminiscent of the notion of sense of community, Ren, Kraut, and Kiesler (2007) suggest the Common Identity Theory and Common Bond Theory as a way for examining users' attachment to the online group, as a whole or as individuals. They suggest that

despite their conceptual distinction, identity-based attachment may evolve into bond-based attachment and vice versa. This result would be predicted from the fact that both types of engagement lead people to participate in the community. This participation, in turn, should create opportunities and conditions under which people develop the other type of attachment. Thus, those who begin interacting in an online sports community because of their interest in a local team might later make friends in the community. Conversely, people who join to be with friends might later become attached to the team and the community surrounding it. (p. 401)

We propose Wikipedians' attachment to other Wikipedians or to the whole Wikipedia community is fostered by the multiple opportunities of its enabled interactivity.

Let us review now, in further detail, the various elements composing a persons' sense of community (Chavis & Pretty, 1999; McMillan & Chavis, 1986). Community is sensed through membership, influence, integration, and

fulfillment of needs, and shared emotional connection. Although fulfillment of members' personal and communal needs is similar to the gratifications previously discussed, the additional three elements proposed will be discussed with its relevance to studying Wikipedians' sense of community.

Users' membership in a community is accounted for by various attributes: foremost are the community boundaries that indicate who belongs and who does not. Another important factor is identification and sense of belonging to the community. The element of membership as part of users' sense of community is even more significant in Wikipedia since being a member in Wikipedia is self-selected and self-commitment process.

The power to influence is yet another element of users' sense of community. Influence in a community is bidirectional: members of a group feel empowered to have influence over what a group does (otherwise, they would not be motivated to participate), and group cohesiveness depends on the group's having some influence over its members. In Wikipedia, contributors can have immediate influence on article content and can take part in many editorial and community life decisions. Participation is the direct and unmediated vehicle for achieving such influence. Thus, in Wikipedia, a community contribution is as direct a component of community life as it might be anywhere.

Shared emotional connection is primarily an attribution of the community-shared history. Many features contribute to the shared emotional connection, including the quality of interactions as well as its intensity and the amount of time they are willing to spend performing these interactions. In earlier studies of online communities, the tendency to use first-person plural in reference to the collection of participants was noted to be an indirect indicator of emotional involvement. When "users" refer to each other as "we" or "us," they are likely to be more emotionally involved (Sudweeks, Mclaughlin, & Rafaeli, 1998). Wikipedians are known to use the same sort of plural, first-person approach. Wikipedians interactions as another possible explanation of motivation to contribute will be discussed next.

Wikipedia-Enabled Interactivity

A more generic examination of users' participation in other, similar cyberspace environments might shed light on Wikipedians incentives for contributing content or for participating in other ways in Wikipedia. For example, consider the cases of participation in open source projects (Hars & Ou, 2001) and peer-to-peer sharing (Adar & Huberman, 2000) mentioned earlier.

In the case of online games, Bartle (1996) identified and described four types of Multiple User Domain (MUDs) players: achievers, explorers, socializers, and killers. Alongside the scale between acting and interacting, Bartle describes

achievers as the players who give themselves game-related goals (usually some form of points gathering), thus acting within the MUDs world. *Explorers* aspire to discover as much as they can about the MUDs, thus interacting with the virtual world defined by it. *Socializers* use MUDs communicative facilities for interacting with other players and apply role-taking opportunities for social purposes. *Killers* are different. They use various MUDs tools to act on other players, causing them distress or, in rare cases, to help them.

Joyce and Kraut (2006) examine what causes a person who posts once to an online group to repeat and contribute to it again. They suggest three possible explanations in which group interactions might increase newcomers' commitment to the community: (1) Repeated actions lead to positive reinforcements, thus users are more likely to continue their participation in a community if they receive a response. Receiving a response, a positive response, and a response that brings about some of the users explicit needs are all considered as reinforcing events. (2) Reciprocal exchange within the community can set up an unspoken obligation to the group. This would hold true even in the case of unequal exchanges. (3) Personal bonds with group members because of interactions foster commitment to the community.

In a sense, Joyce and Kraut's explanations speak to the importance of interactivity in online communities. In a study of online helping in Internet groups, Wasko and Faraj (2000) suggest that altruism, generalized reciprocity, and community interest created by ongoing interaction of the members of the online groups are important motivations. Thus, a possible role in user incentives and continued participation in Wikipedia is played by enabled interactivity.

On Wikipedia, there are ample opportunities to "interact," even in the strictest sense of interactivity. In addition to editing actions performed on the blank page and on text entered by others earlier, there are discussion pages for each article; conversations in users' personal pages, and one-time special projects devoted to creating categories or ramping up levels of internal linking. There are discussions of fund-raising drives and modification of editing rules. There are votes held and campaigns conducted. Wikipedia is rife with opportunities for participants to weave into the social structure. We propose that this weaving, conducted through acts of dyadic interactivity as well as larger-scale, community-based interaction, plays a central role in motivating the more active of the participants. We expect these opportunities to play a major part in motivating the base rate of participation and in explaining Wikipedia's long-run success. Of course, these energized motivations are of interest for other Wiki-driven environments as well. As Wiki processes multiply, and the wiki tool set spreads out from the narrow world of encyclopedias into broader applications in knowledge management, the interactive arrangements and the manner they feed into motivations become even more important.

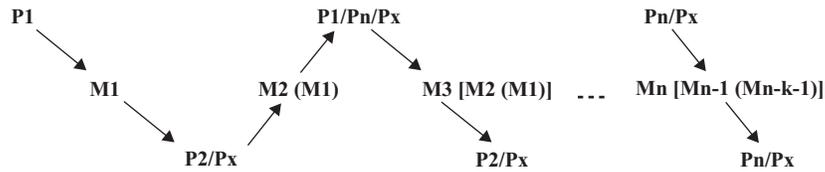


Figure 11.3. *Interactivity as a process-related variable – revisited model.* *P*: Player (Wikipedian) – *P1*...*n* – a community member (target player). *Px* – an unknown community member. *M*: Message (Information) – *M1*...*n* – numbered by temporal sequence. Adapted from: Rafaeli & Ariel, 2007.

Interactivity has been defined in many different ways over the years. An examination of the possible effects of interactivity in Wikipedia supports a definition of interactivity as a process-related variable (Cho & Leckenby, 1999; Macias, 2003; Rafaeli, 1988; Rafaeli & Sudweeks, 1997). Rafaeli (1988) defined interactivity as

a variable characteristic of communication settings... an expression of the extent that in a given series of communication exchanges, any third (or later) transmission (or message) is related to the degree to which previous exchanges referred to even earlier transmissions. (p. 111)

In this definition, interactivity is predicated on the relatedness of sequential messages. Rafaeli and Sudweeks (1997) emphasize that these exchanges are simultaneous, continuous, and carry a social-binding force. Thus, we suggest Wikipedias' interactivity could be examined along the guidelines of the model proposed in Figure 11.3.

To study Wikipedias' interactivity, we should examine various indicators of information transmissions (or messages) within the community. The proposed model (Figure 11.3) for examining interactivity is similar to Rafaeli (1988) and Rafaeli and Sudweeks' (1997) models of interactivity. Although the original model examined direct interactivity between two persons (in each sequence), this model includes consideration of the indirect interactivity between community members (known or unknown), such as Wikipedia.

As mentioned earlier, a variety of scholars found evidence for correlation between interactivity and motivation in online communities (e.g., Joyce & Kraut, 2006; Kollock 1999; Rafaeli & Ariel, 2007; Subramani & Peddibhotla, 2003). Wikipedia enables interactivity through various community-based interactions. These interactions, described in Figure 11.3, stimulate user-generated content and knowledge building procedures. Thus, searching for the possible motivations for active participation in this process is essential for understanding how interactivity works in a virtual community, such as Wikipedia.

Early Empirical Findings and Conclusions

The theory of Wikipedia needs to catch up with its practice. Wikipedia has been growing at impressive rates. Most if not all of this growth is grass-roots and bottom up. This growth is not explained by traditional vectors of funding, fiat, or momentum. Instead, the multidimensional, sociological, and psychological motivations of individual contributors take center stage.

Based on Clary et al.'s (1998) six motivational categories for volunteering, Nov (2007) surveyed possible Wikipedians motivations for contributing to Wikipedia: (1) express values of altruism by sharing their knowledge with others; (2) social engagement via the collaborative dynamics of Wikipedia; (3) exercising various knowledge, skills, and abilities; (4) promoting their current or future professional career; (5) protecting one's (Wikipedian) ego by sharing knowledge with those who do not have this knowledge; (6) enhancing one's ego through the public exhibition of their knowledge. Nov suggests two more categories addressing Wikipedians' motivations: (7) fun (echoes of Ludenic theory; see Rafaeli, 1986) and (8) ideology for contributing to Wikipedia as a variant of open-source application (based on Hars & Ou, 2001). Results of a survey of 151 respondents who are heavy Wikipedia contributors, indicates fun and ideology ranked the highest, whereas promoting one's career and social engagement ranked the lowest. Rafaeli, Ariel and Hayat's (2005) survey reveals that the strongest motivators are cognitive (e.g., "learning new things" and "intellectual challenge"), affective (e.g., "pleasure"), and, contrary to Nov's (2007) results, integrative (e.g., "sharing my knowledge with other Wikipedians" and "contributing to other people"). Similarly, Schroer and Hertel (2007) surveyed German Wikipedians, searching for potential predictors of Wikipedians engagement and satisfaction from contributing to Wikipedia and their perceived task characteristics. Their results reveal that satisfaction was determined by perceived benefits, identification with the Wikipedia community, and task characteristics.

As indicated at the opening of this chapter, we believe that Wikipedia is less than egalitarian. It might even be worth stating that the rumors of widespread, even anarchic democracy on Wikipedia were both premature and wrong. The collaboration on Wikipedia is enabled more by differentiating variables and processes than by equalizing rules and norms. The motivations of contributors are therefore both variable and of great interest. The accomplishments of Wikipedia and the large and growing social and cultural effect brought about by it, as well as the widespread adoption of wiki tools and Wiki culture warrant investigation of the structure and beliefs that serve as fuel for users to generate user-generated content. Much-needed future work on these issues can be directed at the contrasts between the various strands of explanation: psychological, sociological, community-oriented, economical,

gratificational, and interactional aspects as potential sources for motivation.

To summarize, it appears that the search for Wikipedians participation and contributions should not be limited to one perspective or one-dimensional scale for measuring motivations. We propose that the continuing examination of Wikipedians' participation should involve contrasting (1) professional versus nonprofessional participation; (2) constructive, confrontational, and vandalistic participation; (3) continuous versus one-time participation; (4) anonymous versus identifiable participation; (5) content contribution, community involvement, and (silent) participation in the form of lurking. Wikipedia's continued growth and the implementation of wiki methods in other content and action domains offer ample opportunities for examining these dimensions. The challenge for further research is in an assessment of the relative strengths and the interactions between these dimensions.

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