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# Wikipedia's Success and the Rise of the Amateur-Expert

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# Social Software and the Evolution of User Expertise:

## Future Trends in Knowledge Creation and Dissemination

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## Chapter 2

# Wikipedia's Success and the Rise of the Amateur–Expert

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### ABSTRACT

*The Free Online Encyclopedia, as Wikipedia calls itself, is a radical departure from traditional encyclopedias and traditional methods of knowledge creation. This chapter is an examination of how a community of amateurs on Wikipedia has challenged notions of expertise in the 21st century. It does so by first looking at the roots of Wikipedia in a phenomenon known as the “wisdom of the crowds” and in the open source software movement. The reliability of Wikipedia is examined as are the claims made by major critics of the project. Throughout, epistemological questions raised by Wikipedia are addressed.*

### INTRODUCTION

*“Because the world is radically new, the ideal encyclopedia should be radical too. It should stop being safe—in politics, in philosophy, in science” (Encyclopedia Britannica editor, Charles Van Doren, 1962).*

For most of the 20th century, having a print encyclopedia set on your home bookshelf was a hallmark of learning and education. While tradi-

tional encyclopedias are undoubtedly a valuable and authoritative reference source, the process of their creation from beginning to end is imbued with a certain level of elitism. Individual articles are written only by carefully selected experts, publication is tightly controlled by major printing houses, and access is limited to academic institutions, libraries, and those who can afford to purchase a set. In 2011, the 32 volumes of the *Encyclopedia Britannica* cost \$1,395, putting it far out of reach for the vast majority of individuals (BritannicaStore.com, 2010).

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Well before the advent of the Internet, one of the most successful strategies for selling encyclopedias was through door-to-door salesmen. While unimaginable in the digital age, encyclopedia publishers found that it often required that intimate level of human interaction to convince customers to make such a substantial book purchase. In *The Great EB: The story of the Encyclopedia Britannica*, Herman Kogan recounts the heyday of the door-to-door encyclopedia salesman:

*On any day or night of any week there is an Encyclopedia Britannica salesman sitting or standing in a living room, a kitchen, a study, a den, an office or in some less conventional place, with material from his sales kit spread before him as he "tells the story" to a potential customer. (Kogan, 1958: 299)*

Salesmen were trained in the psychology of selling, they had to serve an apprenticeship under an experienced salesman, and they even went so far as to scour newspapers for the names of recent graduates to contact for a potential sale (Kogan, 1958). One evening in 1969, the Wales family of Huntsville, Alabama, was convinced to purchase a set of *World Book Encyclopedias* from one of these door-to-door salesmen (Schiff, 2006). Three years prior to that evening, the Wales family had welcomed a son, Jimmy Wales. Jimmy was educated in the private Montessori-influenced school where his mother taught. During this time Jimmy "spent lots of hours pouring over the *Britannicas* and *World Book Encyclopedias*" (Lamb, 2005). Drawing in part on these early childhood experiences, in 2001 Jimmy Wales helped to found Wikipedia, The Free Encyclopedia. Wikipedia quickly became more radical than anything Charles Van Doren could have dreamed of in 1962.

As of 2011, Wikipedia is the sixth-most-visited US website, falling not far behind giants such as Google and Facebook (Top Sites in the United States, 2011). The scale of Wikipedia is astounding. Its English language version currently

has more than 3.6 million articles; worldwide, it has 17 million articles in 270 different languages (Statistics, 2011). As an entity that both creates and disseminates knowledge, Wikipedia has no peer. Its articles frequently appear among the first few links returned by a Google search, so its reach and impact factor are enormous. As an encyclopedia, Wikipedia is certainly radical in that the site is freely accessible to anyone with an Internet connection. What the average Wikipedia user often does not realize is that the site has been operated as a not-for-profit from the very beginning. The site does not sell any advertising and is not beholden to any outside interests. According to Wales, the goal of Wikipedia is nothing short of creating "a world in which every single person is given free access to the sum of all human knowledge" (Lih, 2009: xv). The radical freedom of Wikipedia extends well beyond free access. The use of its content is governed by both a Creative Commons License and the GNU Free Documentation License, ensuring that all users of Wikipedia can copy, modify, and redistribute anything in Wikipedia that is not otherwise protected. Wikipedia is also radically egalitarian in its approach to the creation of knowledge. All 17 million Wikipedia articles have been created by uncompensated, anonymous users. In stark contrast to the traditional encyclopedia model, Wikipedia does not require that one be a credentialed expert to write on a subject. With a few exceptions, anyone can create a new article or edit an existing one. Of this radical facet of Wikipedia, Wales has said, "To me, the key thing is getting it right. I don't care if they're a high-school kid or a Harvard professor" (Schiff, 2006: 5). In practice, this does not mean Wikipedia is an "anything goes" sort of place. On the contrary, the Discussion Pages that accompany each Wikipedia article often reveal the nitty-gritty details of the process of knowledge creation, detailing, long, impassioned battles over various elements of the article. Over the long term, this radical openness helps to mitigate authorial bias that often plagues single-authored works.

## BACKGROUND

The encyclopedic impulse—to collect and codify human knowledge—is nearly as old as writing itself. Wikipedia is the most recent in a long line of attempts to document what we collectively “know.” The word *encyclopedia* is derived from the Greek *enkyklios paideia*, meaning “a general or all-around education.” One of the earliest surviving works that has many similarities to modern encyclopedias is the 37-volume *Naturalis Historia* written in the first century AD by the Roman Pliny the Elder. Denis Diderot’s French *Encyclopédie* written in 1751 was the first to introduce an organizational structure that resembles that of current encyclopedias. *Encyclopedia Britannica* is the oldest (1768) and best-known English-language encyclopedia (Blair, 2010). For a more detailed history of early encyclopedias and dictionaries, Ann Blair’s *Too Much to Know: Managing scholarly information before the modern age* is a valuable resource (2010).

Wales’s comment about not caring if Wikipedia authors are high school kids or Harvard professors cuts to the heart of the vigorous debates that surround Wikipedia. In an interconnected, online environment, who are the experts and on what grounds are they claiming expertise? The *Oxford English Dictionary* defines an expert as “One whose special knowledge or skill causes him to be regarded as an authority; a specialist” (Expert, 2011). Interestingly, the authoritative *Cambridge Handbook of Expertise and Expert Performance* chooses to cite a 2005 definition of “expert” from Wikipedia:

*[S]omeone widely recognized as a reliable source of knowledge, technique, or skill whose judgment is accorded authority and status by the public or his or her peers. Experts have prolonged or intense experience through practice and education in a particular field. (Ericsson, Charness, Feltovich, & Hoffman, 2006)*

Michelene Chi describes seven ways in which experts excel and seven ways in which they fall short. The list of ways in which they excel are generating the best solution, their detection/recognition abilities, conducting qualitative analyses, self-monitoring, choosing appropriate strategies, seizing opportunities, and cognitive effort. Acknowledging the ways in which experts fall short is essential to understanding the arguments presented in this chapter. Chi lists the following seven ways in which experts fall short: expertise is domain-limited, overly confident, context dependent, inflexible; experts sometimes tend to gloss over important aspects, which may lead to inaccurate prediction; they are judgmental, and show bias and functional fixedness (Ericsson et al., 2006: 24-27). The issue of expert bias in particular has provided one of the footholds for Wikipedia. In a very short period of time, Wikipedia has mounted a major challenge to expert control over knowledge creation and dissemination as traditionally understood. The success of Wikipedia is derived from the tireless efforts of tens of thousands of amateur-experts: people who have gained a great deal of specialized knowledge through study or practice, but who lack traditional academic or professional credentials.

The primary objective of this chapter is to take a closer look at the ways in which amateur-experts are creating knowledge on Wikipedia while subverting traditional notions of expertise. The chapter will explore the roots of Wikipedia in both the encyclopedic tradition and the open source software movement. The concept of epistemic egalitarianism will be defined along with its implications for Wikipedia. Crowdsourcing has enabled Wikipedia to fully utilize its vast community of amateur-experts. Another objective of this chapter is to ask whether crowdsourcing can yield reliable knowledge. The accuracy and reliability of Wikipedia articles has been hotly debated since its inception. I will look at both sides of this argument as well as empirical research done in this area. This chapter also addresses some of the

arguments of major critics of Wikipedia. I close with some thoughts on knowledge creation, evolving notions of expertise, and possible implications for Web 3.0.

## **ROOTS IN THE OPEN SOURCE MOVEMENT**

Wikipedia has been able to overcome some of the limitations of traditional encyclopedias such as cost and scale by leveraging the potential of the Internet, and, specifically, lessons learned from the open source software movement. To understand why Wikipedia works successfully without traditional experts, it is important to have a basic understanding of its roots within open source software. Open source is defined as software whose underlying code is made freely available for anyone to improve, modify, or reuse. Open source also requires free redistribution rights (Open Source Software, 2011). The earliest example of open source software is the UNIX operating system released in 1971. Later open source software projects that built on the success of UNIX include the widely used Linux operating system (1991) and the Mozilla Firefox Web browser (2003).

In 1997, open source advocate Eric Raymond wrote a seminal essay about the open source movement titled “The Cathedral and the Bazaar.” In the essay (later developed into a book with the same title), Raymond likens the traditional corporate model of software development to a cathedral that was “carefully crafted, by individual wizards or small bands of mages (magicians) working in splendid isolation.” The open source community, on the other hand, “seemed to resemble a great babbling bazaar of differing agendas and approaches ... out of which a coherent and stable system could seemingly emerge only by a succession of miracles” (Raymond, 1999: 24). Much to Raymond’s (and nearly everyone else’s surprise),

open source software design worked quite well in many cases. One of the reasons it works is that it utilizes and simplifies mass collaboration. Raymond has summarized this concept in what has become a maxim for the open source movement: “Given enough eyeballs, all bugs are shallow,” meaning that if you get enough people working on a problem, someone will come up with a solution (29). Raymond’s essay was very influential in shaping Wales’s vision for Wikipedia: “It [*The Cathedral and the Bazaar*] opened my eyes to the possibility of mass collaboration” (Schiff, 2006).

Significantly, many champions of the open source movement take pains to distinguish Wikipedia from traditional open source projects. Jeff Bates, a vice president of the Open Source Technology Group, oversees a website that hosts 80,000 open source projects. In a 2006 *New York Times* article he said, “It makes me grind my teeth to hear Wikipedia compared to open source,” and that every open source project has its “benevolent dictator,” someone who takes responsibility, even though the code has been contributed by many (Stross, 2006). Throughout its relatively short existence Wikipedia has struggled with just this issue: should the site remain completely open and treat every user as equal or are benevolent dictators in the shape of editors and administrators required to keep the site from devolving into chaos? This debate is ongoing and continues to shape how knowledge is created on Wikipedia. In any case, lessons learned from the open source movement have been critical to Wikipedia’s success. It is significant to the arguments put forth in this chapter that the open source movement has always extended an open invitation to anyone who is interested in working on the software. It is not limited to only expert programmers. Many of the most productive open source contributors are often hackers, gamers, and hobbyists—in other words, amateur-expert programmers—working well outside the corporate world and lacking academic credentials.

## CROWDSOURCING

The kind of mass collaboration open source software relies upon is referred to as crowdsourcing. Two recent books have explored crowdsourcing not just within open source software design, but also within many business and everyday life contexts: *The Wisdom of the Crowds* (2004) by James Surowiecki and *Crowdsourcing: Why the power of the crowd is driving the future of business* (2008) by Jeff Howe. Howe's book specifically addresses Wikipedia and provides a blueprint for successful crowdsourced projects. Surowiecki's book is perhaps the more interesting read as he provides many examples of how crowdsourcing plays out in everyday life. Both books demonstrate how in many situations the wisdom of a crowd of amateurs surpasses the best efforts of traditional experts. Howe defines crowdsourcing as "the act of taking a job traditionally performed by a designated agent (usually an employee) and outsourcing it to an undefined, generally large group of people in the form of an open call" (Howe, 2006). The genius of Wikipedia is that it managed to successfully crowdsource the substantial work of creating an encyclopedia.

Although the term crowdsourcing is new, the phenomenon is not. *Vox populi* is a Latin phrase that means "voice of the people." *Vox Populi* was also the title chosen by Sir Francis Galton for an article he published in the journal *Nature* in 1907. The article recounts an experiment that Galton designed to test the wisdom of the crowds. At a regional fair in England a competition was set up where participants had to guess the weight of a slaughtered ox. The contestants numbered about 800, and most of them, Galton observed, had no expertise in judging cattle. The result of the experiment was that the average guess—the wisdom of the crowd—was only 9 pounds (less than 1%) off the actual weight of 1,207 pounds. Surprised by the accuracy of the crowd, Galton concluded: "This result is, I think, more creditable

to the trustworthiness of a democratic judgement than might have been expected" (Galton, 1907).

Almost 100 years later, NASA came up with an experiment that they dubbed "Clickworkers." The basis of the experiment was to find out whether "public volunteers, each working for a few minutes here and there can do some routine science analysis that would normally be done by a scientist or graduate student working for months on end" (Benkler, 2006: 69). The task at hand was to classify craters on maps of Mars. In the first six months of the project 85,000 volunteers made more than 1.9 million different entries. Regarding the question of expertise and quality, NASA researchers concluded that "the automatically-computed consensus of a large number of clickworkers is virtually indistinguishable from the inputs of a geologist with years of experience in identifying Mars craters" (Benkler, 2006: 69). The crowdsourcing model has proved to be not only effective in distributing a large task, but also highly accurate and reliable in its results.

Surowiecki provides one more compelling contemporary example of the wisdom of the crowd again bettering the experts. The popular game show *Who Wants to Be a Millionaire?* asked contestants a series of increasingly difficult trivia questions for the chance to win a million dollars. If the contestants were stumped along the way, they had a few "lifelines" that included phoning a friend (the expert) or polling the studio audience. Surowiecki recounts the results of this ad hoc experiment:

*[T]he "experts" did okay, offering the right answer—under pressure—almost 65 percent of the time. But they paled in comparison to the audiences. Those random crowds of people with nothing better to do on a weekday afternoon than sit in a TV studio picked the right answer 91 percent of the time. (2004: 4)*

Surowiecki summarizes the power of crowdsourcing as follows:



*Under the right circumstances, groups are remarkably intelligent, and are often smarter than the smartest people in them. Groups do not need to be dominated by exceptionally intelligent people in order to be smart. Even if most people within a group are not especially well-informed or rational, it can still reach a collectively wise decision. (Surowiecki, 2004: xiii)*

This feature of the wisdom of the crowds is precisely why Wikipedia articles are as a whole quite reliable.

## **BRIEF HISTORY OF WIKIPEDIA**

The historical evolution of encyclopedias, the open source software movement, and the power of crowdsourcing all paved the way for Wikipedia. Rather fittingly, Wikipedia itself provides one of the better histories and general overviews of the site. Of particular interest are the entries “About Wikipedia,” “Wikipedia History,” “Wikipedia: Five Pillars,” and “Wikipedia: Contributing to Wikipedia.” One of the most thorough books covering the history of Wikipedia and its internal workings is *How Wikipedia Works and How You Can Be a Part of It* (Ayers, Matthews, & Yates, 2008). A more concise overview is provided by *The Wikipedia Revolution: How a bunch of nobodies created the world's greatest encyclopedia* (Lih, 2009).

Jimmy Wales was earlier introduced as one of the founders of Wikipedia, but a general understanding of how Wikipedia came to be and how it works today is critical to understanding how Wikipedia is challenging our understanding of knowledge creation and expertise. Wikipedia was not Wales's first attempt at creating a free online encyclopedia. By 1999, Wales was a retired options trader and successful Web entrepreneur. He had an idea to create a free, online encyclopedia created by volunteers. To help accomplish his vision he hired Larry Sanger. Sanger had a PhD

in philosophy; his specific area of interest was epistemology—the theory and understanding of knowledge. Wales and Sanger named their first encyclopedia effort Nupedia. Nupedia was launched in 2000, and was free and written by volunteers, but unlike Wikipedia, the volunteers were expert scholars with PhDs in their field of study and the articles went through an extensive peer review process. Basically, Wales and Sanger were trying to re-create a traditional encyclopedia on the Web—for free. Not surprisingly, the endeavor failed by 2003. By the time the site went offline it had amassed a grand total of 24 completed articles. Apparently the community of expert scholars was unwilling to contribute to a free encyclopedia without compensation (Lih, 2009; Nupedia, 2011).

In 2001, Sanger had dinner with a friend who told him about a new website called WikiWikiWeb. WikiWikiWeb was created by a programmer named Ward Cunningham who borrowed the Hawaiian word *wiki* which means “quick.” Quickness and ease of use were the genius behind the wiki platform. On a wiki any user can quickly edit a webpage without logging on and without any expert programming knowledge. It also archives all edits and also allows easy rollback to an earlier version of the page—something that was important to its eventual use as the platform for Wikipedia. Essentially the connectivity and critical mass of the Internet coupled with the unique features of the wiki platform greatly simplified the potential for crowdsourcing large projects.

Not long after Sanger heard about the wiki platform he created a wiki which he hoped would serve as a feeder site for Nupedia. The Nupedia experts did not like letting amateurs fiddle with their work so, on January 15, 2001, Sanger moved the wiki to its own URL and gave it a new name: Wikipedia. Less than two weeks later, 224 different people had visited Wikipedia and it had nearly 5,000 page views on a single day (Lih, 2009: 65). From then on, more and more time was devoted to Wikipedia as Nupedia foundered and was finally taken offline in 2003.

## PHILOSOPHY OF WIKIPEDIA

The philosophical foundations of Wikipedia were shaped by both Wales and Sanger, but it was Sanger's philosophical background in epistemology that most likely had the strongest impact. Undoubtedly, some of the most erudite explorations of the evolving nature of knowledge and expertise in an online environment (not just as it relates to Wikipedia) have come from Sanger. Three of his essays should be required reading for anyone interested in a philosophical inquiry into knowledge and expertise: "Why Make Room for Experts in Web 2.0?" (2006), "Who Says We Know?: On the new politics of knowledge" (2007), and "The Fate of Expertise after Wikipedia" (2009). In "Who Says We Know?: On the new politics of knowledge," Sanger discusses one of the core principles of Wikipedia: *epistemic egalitarianism*.

*According to epistemic egalitarianism, we are all fundamentally equal in our authority or rights to articulate what should pass for knowledge; the only grounds on which a claim can compete against other claims are to be found in the content of the claim itself, never in who makes it. (Sanger, 2007)*

Herein lies the root of what makes so many people uncomfortable with Wikipedia. Traditionally expertise was clearly defined by academic coursework culminating with the conferring of a degree or by serving an apprenticeship under an established expert. Epistemic egalitarianism completely subverts that model by giving anyone the right to create knowledge. Under this model, individual efforts will be judged solely on the content without regard to the qualifications of the creator.

### Wikipedia Principles

Wikipedia operates on just five fundamental principles, known as the five pillars:

1. Wikipedia is an online encyclopedia.
2. Wikipedia has a neutral point of view.
3. Wikipedia is free content.
4. Wikipedians should interact in a respectful and civil manner.
5. Wikipedia does not have firm rules. (Five Pillars, 2011)

Of these, "Wikipedia has a neutral point of view" has the most impact on how Wikipedia is changing the nature of expertise and knowledge creation. This pillar sets Wikipedia in stark contrast to traditional encyclopedias. Most traditional encyclopedia articles are written by a single author and then reviewed and edited by only a couple other people. Wikipedia specifically guards against single-authored articles. For example, you are not supposed to create a biography of yourself on Wikipedia because by definition that would not be a neutral point of view.

One of the major flaws of the traditional model of expertise is that it allows—even encourages—authorial bias and sometimes fails to take into account dissenting and alternative views. Knowledge is created on Wikipedia by specifically encouraging all dissenting views. Two pieces of the wiki platform that enable this exchange are the discussion (or "talk") pages and the history pages. Each and every Wikipedia article has a separate tab for discussion about that article as well as a history tab that documents each and every edit. Author and journalist Cory Doctorow explains the significance of these features of Wikipedia:

*[I]f you want to really navigate the truth via Wikipedia, you have to dig into those "history" and "discuss" pages hanging off of every entry. That's where the real action is, the tidily organized palimpsest of the flamewar that lurks beneath any definition of "truth." (2006)*

Wikipedia is a grand experiment in determining the nature of truth. You, the user, have to decide if truth is a specific product of expertise or whether

it can also arise from a democratic process of debating, compromising, and eventually settling on a consensus.

## **ISSUES, CONTROVERSIES, AND PROBLEMS**

Wikipedia has become very widely used, very quickly: the site received 400 million unique visitors during March 2011 (About, 2011). Wikipedia has also been widely criticized. Many of the general criticisms stem from the tension between experts and amateurs as well as the radical ways in which Wikipedia creates and disseminates knowledge. While far from a comprehensive analysis of the criticisms against Wikipedia, the following section will address both some of the major issues and some of the major critics themselves. Major issues that will be examined are reliability/accuracy, and problems surrounding bureaucracy on the site. Larry Sanger was instrumental in creating Wikipedia, but by 2002 he had become disillusioned with the project and was then laid off by Wales during a budget crunch. Sanger's criticisms of Wikipedia get to the heart of the expert/amateur debate and merit close examination. Two other outspoken critics whose claims will be examined are Jaron Lanier (*Digital Maoism* [2006] and *You Are Not a Gadget* [2010]) and Andrew Keen (*The Cult of the Amateur* [2007]).

### **Death by Wikipedia**

January 20, 2009, was the date of President Barack Obama's inauguration. At a post-inauguration luncheon a great tragedy befell the US political community when both the ailing Senator Edward (Ted) Kennedy and the aging Senator Robert Byrd passed away. According to Kennedy's Wikipedia biography from that day, "Kennedy suffered a seizure at a luncheon following the Barack Obama Presidential inauguration ... He was removed in a wheelchair and died shortly after" (Pershing,

2009). Byrd's entry had a death date added, but only noted that he had collapsed during the same luncheon. The speed of this reporting was exceptional, occurring shortly after the actual luncheon. The reliability of the information, however, left much to be desired since neither Senator actually died on January 20, 2009. Both Senators lived for at least a few months after having been killed off on Wikipedia. Kennedy and Byrd are just two of the high-profile examples of a phenomenon that became so common that it had its own name: "Death by Wikipedia." This Death by Wikipedia anecdote serves as the perfect introduction into the single most controversial issue surrounding Wikipedia: reliability.

### **Reliability**

The defining characteristic of traditional encyclopedias has always been reliability. Schoolchildren are taught to cite encyclopedia articles because they are reliable and written by authoritative experts. Indisputable facts spelled out by encyclopedia articles have been the ultimate arbitrator for bar bets the world over. With that in mind, how has Wikipedia become so successful? Writing in the *New York Times*, Randall Stross distills the entire reliability controversy as follows: "Wikipedia raises a single nagging epistemological question: Can an article be judged as credible without knowing its author?" (2006). Restating his question within the context of this chapter we can ask: Can a diverse group of anonymous amateur-experts consistently create reliable knowledge? To begin exploring these questions the following section will detail some of the studies that have been conducted to test the reliability of Wikipedia and the implications for expertise in a Web 2.0 context.

What do we really mean when we call something reliable? The *Oxford English Dictionary* defines "reliable" as "Of a person, information, etc.: able to be trusted; in which reliance or confidence may be placed; trustworthy, safe, sure"

(2011). Larry Sanger draws on his background in epistemology to add nuance to the concept of reliability:

*Reliability is a comparative quality; something doesn't have to be perfectly reliable in order to be reliable. So, to say that an encyclopedia is reliable is to say that it contains an unusually high proportion of truth versus error, compared to other publications. (Sanger, 2007)*

*Encyclopedia Britannica* is the oldest and best-known English-language encyclopedia; therefore, comparisons with Wikipedia were inevitable. The first edition of *Encyclopedia Britannica* was printed in 1768 and Wikipedia first appeared online in 2001. In terms of size, the current (2010) print version of the *Encyclopedia Britannica* contains 65,000 articles and the online version 120,000 (Britannica, 2011). The English language Wikipedia currently has 3.6 million articles. Everyone who has used Wikipedia with any degree of regularity will have encountered vast differences in quality between articles. Some articles are fully developed, well written, and well documented. Other articles (usually on lesser-known topics) are barely coherent and almost devoid of documentation. This common experience has led many people to ask, "How reliable is Wikipedia anyway?"

## **BRITANNICA VS. WIKIPEDIA**

In a 2005 issue of the journal *Nature*, Jim Giles reported on a study that attempted to compare the reliability and accuracy of Wikipedia and *Britannica* science articles. While far from comprehensive and widely criticized (particularly by *Britannica*), the study results made national headlines and have since been frequently cited by Wikipedia supporters. *Nature* engaged a panel of experts to review 42 entries on scientific topics for errors. The conclusion of the study was that "[t]he exercise revealed numerous errors in both

encyclopedias, but among 42 entries tested, the difference in accuracy was not particularly great: the average science entry in Wikipedia contained around four inaccuracies; *Britannica*, about three" (Giles, 2005). While these results can certainly not be applied to Wikipedia as a whole, the fact that articles written by unpaid amateurs were found to be nearly as reliable as those in the best encyclopedia was certainly mind-opening to many.

One of the undisputed advantages of an online encyclopedia is the ability to instantly correct a problem or edit an article based on a new event or finding. The traditional print encyclopedia is less flexible in this respect. The only way to correct a problem is to issue a new print supplement or wait for the next printing. Wikipedia capitalizes on this shortcoming of print encyclopedias by pointing out nearly 30 pages of "Errors in the Encyclopaedia Britannica that have been corrected in Wikipedia" (Errors ..., 2011). In all fairness, the new online versions of *Encyclopedia Britannica* allow editors the same flexibility in fixing errors and updating articles, but this privilege is reserved only for expert editors.

While reporting on Wikipedia for the *New Yorker*, Stacy Schiff asked Jorge Cauz, the president of *Britannica* for an analogy comparing the two resources. He replied, "Wikipedia is to *Britannica* as 'American Idol' is to the Julliard School" (Schiff, 2006). Jimmy Wales quickly responded with his own analogy: "Wikipedia is to *Britannica* as rock and roll is to easy listening. It may not be as smooth, but it scares the parents and is a lot smarter in the end" (Schiff, 2006). One can easily substitute "experts" or "publishers" for "parents" in Wales's analogy and it would still hold true. Wikipedia has played such a crucial role in the quickly evolving nature of new forms of collective expertise because it has been so successful and prolific in such a short period of time. Sanger again spells out the implications for traditional expertise: "In a world in which so many people are consulting an encyclopedia 'anyone can edit' for answers, the conventional wisdom,

the accepted knowledge, seems less tethered to experts, exclusive institutions, and publications with professional gatekeepers” (Sanger, 2007).

While the *Nature* study received the most attention from the press, many other lesser-known studies have also tried to tackle the reliability question. One of the most comprehensive lists of Wikipedia reliability studies is on Wikipedia itself under the article “Reliability of Wikipedia.” A small sample of these studies is summarized below.

The majority of studies that have examined article reliability on Wikipedia have done so by analyzing or monitoring individual articles. During the 1st Workshop on Social Media Analytics, Sara Javanmardi and Cristina Lopes (2010) presented a paper discussing how they developed “an automated measure to estimate the quality of article revisions throughout the entire English Wikipedia.” Their analysis of article “quality” relied heavily upon the reputation of a given editor. Their findings include “that non-featured articles tend to have high-quality content 74% of the time, while featured articles average 86%” (Javanmardi & Lopes, 2010). The authors note that the quality of articles changes over time, but more importantly, this study “showed that the average article quality increases as it goes through edits” (Javanmardi & Lopes, 2010). This study lends weight to the assertion that a crowdsourced project like Wikipedia will increase in quality over time as more and more participants contribute to the project.

Lucy Holman Rector, a librarian at Harford Community College, Maryland, conducted an article-by-article reliability study similar to that conducted by *Nature*. Instead of just comparing the articles to *Britannica*, Rector also included two additional standard information reference sources: the *Dictionary of American History* and *American National Biography Online*. The findings of her study were similar to those published by *Nature*: “Overall, Wikipedia’s accuracy rate was 80 percent compared with 95–96 percent accuracy within the other sources” (Rector, 2008).

While this accuracy rate for Wikipedia articles is not bad, Rector also uncovered unattributed quotes in eight out of nine articles and five possible cases of plagiarism.

One final, informal study is significant not so much for its findings, but for what it tells us about behind-the-scenes editing at Wikipedia. In 2008, P.D. Magnus anonymously inserted 36 short, fake statements into Wikipedia articles about notable, deceased philosophers. He then monitored the articles for 48 hours to see if the false statements were corrected. Magnus found that “[o]f 36 fibs, 15 were removed within 48 hours. Three others were not removed, but were marked as needing citation” (2008). As the author realized, some of the speedy corrections were due to “guilt by association.” Even anonymous edits are identified by a unique IP address. Wikipedia also tracks recent changes, which volunteer editors monitor closely. In this case, an editor discovered the vandalism to one article and checked to see what other changes were made by the same user.

No traditional information reference source (encyclopedia, dictionary, almanac, etc.) written by experts is entirely free from error. Moreover, many of these traditional resources are much more prone to author bias than Wikipedia. Wikipedia articles certainly vary greatly in quality and accuracy, but if we use Sanger’s definition of reliability from above (“contains an *unusually high* proportion of truth versus error, compared to other publications”) then Wikipedia can be said to be reliable in general. Cory Doctorow neatly summarizes the reliability issue:

*So Wikipedia gets it wrong. Britannica gets it wrong, too. The important thing about systems isn't how they work, it's how they fail. Fixing a Wikipedia article is simple. Participating in the brawl takes more effort, but then, that's the price you pay for truth, and it's still cheaper than starting up your own Britannica. (Doctorow, 2006)*

## WIKIPEDIA BUREAUCRACY

For all of its radical openness, Wikipedia has not done away that cornerstone of encyclopedias: the editor. Without editors, Wikipedia would quickly devolve into chaos and flame wars between various factions. Editors do serve as a sort of expert on Wikipedia, but the process of becoming an editor remains egalitarian. Many editors are identified only by their username and traditional academic credentials play no role in becoming an editor: “An expert has the same privileges as any other editor: Expertise must manifest itself through the editing and discussion process” (Ayers: 54). In one sense everyone is an editor on Wikipedia. Unregistered users still account for the majority of edits on Wikipedia, but they have not been able to create entirely new articles since 2005. Those who do choose to create an account (as opposed to unregistered, anonymous editing) are given additional editing privileges and tools. According to internal Wikipedia statistics, as of January 2012 there were 16 million of these “named accounts” worldwide. “About 300,000 editors have edited Wikipedia more than 10 times. Approximately the same number, 300,000 editors, edit Wikipedia every month; of those, about 50,000 make more than five edits, and 5,000 make more than 100” (Wikipedians, 2012).

In 2009, researchers from the Augmented Social Cognition Research branch of Xerox’s Palo Alto Research Center analyzed 200 million edits from the English language Wikipedia and discovered that [i]n Wikipedia, the population of editors follows a power law distribution (also known as the long tail distribution). That is, relatively few highly prolific users account for a large percentage of the overall editing activity. A large population (the long tail) of less prolific editors contribute the rest of the content. (Suh, Covertino, Chi, & Pirolli, 2009)

A 2006 *New Yorker* article echoed this analysis, finding that, “There are two hundred thousand registered users on the English-language site, of

whom about thirty-three hundred—fewer than two percent—are responsible for seventy per cent of the work” (Schiff, 2006). Not only is article creation and editing skewed toward a relatively small minority, the demographics of Wikipedia editors are also unbalanced. A 2010 survey of more than 50,000 Wikipedia contributors worldwide found that 87% were male and the average age was 25 (Glott, Schmidt, & Ghosh, 2010).

Above the category of registered editors, Wikipedia has gradually added a few additional levels of bureaucracy, starting with administrators, bureaucrats, and then stewards. In 2012, there were 1,500 administrators for the English language Wikipedia. Admins “can protect, delete and restore pages, move pages over redirects, hide and delete page revisions, edit protected pages, and block other editors” (Administrators, 2012). To “protect” a page means to restrict the ability of anyone to edit the page content to some degree. There are varying levels of protection ranging from “Full” (only admins can edit) to “Pending Changes” (edits are checked by a reviewer before going live). Restricting the editing of articles in this manner is decidedly anti-egalitarian since it puts special powers in the hands of administrators. Much to the dismay of the purists, these sorts of controls were found to be a necessary evil as Wikipedia evolved. Without the ability to protect articles, some edit wars on controversial topics would go on indefinitely. Prior to being protected, some articles for political candidates were vandalized so frequently that editors could not make corrections fast enough. To some, protecting articles and establishing a bureaucratic hierarchy undermines the entire egalitarian spirit that Wikipedia was founded on. A 2009 *Wall Street Journal* article observed that “as it matures, Wikipedia, one of the world’s largest crowdsourcing initiatives, is becoming less freewheeling and more like the organizations it set out to replace” (Angwin & Fowler, 2009). Still, the process of entering and ascending the Wikipedia bureaucracy remains egalitarian and democratic. Credentials count for

nothing while a demonstrated history of quality editing is of utmost importance. Administrators, bureaucrats, and stewards are all elected by others in the Wikipedia bureaucracy. Regular editors and administrators can—and often do—challenge the top levels of Wikipedia bureaucracy. It was challenges such as these, coupled with philosophical differences in the structure of Wikipedia, which eventually caused Larry Sanger to leave in the early days of the project.

## **SANGER'S DEFECTION AND BOMIS**

As one of the key architects of both the original Nupedia project and then Wikipedia, and a traditional expert with a doctorate degree in philosophy, Sanger was impressed by Wikipedia's quick success, but he never wholly bought into the idea of a completely egalitarian encyclopedia. Sanger always held onto the idea that Wikipedia would be better and more reliable if experts were granted some level of authority over the amateur editors. This concept of authority and expertise was, of course, very much at odds with Wikipedia's radically open and egalitarian model. Writing for *The Atlantic*, Marshall Poe captured Sanger's conflict over the project:

*After forging a revolutionary mode of knowledge building, he came to realize—albeit dimly at first—that it was not to his liking. He found that he was not heading a disciplined crew of qualified writers and editors collaborating on authoritative statements (the Nupedia ideal), but trying to control an ill-disciplined crowd of volunteers fighting over ever-shifting articles. (Poe, 2006)*

These philosophical differences with regard to the role of experts on Wikipedia came to a head for Sanger in a public battle with a Wikipedia editor nicknamed Cunctator (Latin for procrastinator). Cunctator argued for a radically open Wikipedia with no internal hierarchy and few limitations on

contributions. He began an edit war (repeatedly undoing deletions or edits) with Sanger. Eventually Sanger appealed to the Wikipedia editors on the internal listserv: “I need to be granted fairly broad authority by the community—by you dear reader—if I am going to do my job effectively” (Poe, 2006). This appeal to authority and expertise struck a sour note not just with Cunctator, but with many of the Wikipedians who believed in the decentralized, open source ideals of Wikipedia. Sanger's struggles with the Wikipedia community coincided with the big dot-com crisis of the early 2000s. Bomis, Wales's other Internet company that actually paid Sanger's salary, was struggling. Due to financial problems at Bomis and Sanger's increasing philosophical differences with Wikipedia, Wales laid off Sanger in early 2002 (Lih, 2009).

For his part, Wales freely admits to being extremely nonconfrontational as a manager. Recognizing the need to encourage amateurs and limit authority, Wales has repeatedly demonstrated an astounding reluctance to use his power, even when the community has begged him to. He wouldn't exile trolls or erase offensive material, much less settle on rules for how things should or should not be done (Poe, 2006). Due in part to its radical openness and commitment to encouraging amateur-experts, Wikipedia has continued to grow successfully.

Not yet ready to completely abandon the idea of a free, universal encyclopedia edited by volunteers, Sanger founded Citizendium in 2007. Quite similar to the original Nupedia concept, Citizendium is explicit in distinguishing itself from Wikipedia:

*The project aims to improve on the Wikipedia model by providing “reliable” and high-quality content; it plans to achieve that goal by requiring all contributors to use their real names, by strictly moderating the project for unprofessional behaviors, and by providing what it calls “gentle expert oversight” of everyday contributors. (Citizendium.com, 2011)*

The roots of Sanger's dissatisfaction with Wikipedia and its attitudes toward traditional experts are clear in the vision he laid out for Citizendium. As of 2011, Citizendium had 15,000 articles in various stages of development, but only 156 articles that were fully approved by experts (Citizendium.com, 2011).

The Nupedia and Citizendium projects would be classified as failures, while Wikipedia stands as an example of how the Internet can harness mass collaboration for the general good of society. In general, the Citizendium model is quite reasonable and should yield high-quality articles that are free for anyone to access and use. Why have so few people embraced it? First, at this point, Wikipedia has a near-monopoly in the area of free, online encyclopedias. People who were amenable to the idea of freely contributing to an online encyclopedia are already committed to the Wikipedia model. Second, potential contributors are probably put off by the idea of expert editors changing or not using their contributions. Why contribute if you have no assurance that your efforts are even going to be used? Third, the deeply egalitarian nature of Wikipedia has struck a chord with many people. They seized the opportunity to contribute in some small way to an idealistic project that opened up the world's knowledge (as agreed upon by the masses) to everyone with an Internet connection. Nupedia and Citizendium fell just short of this lofty ideal and were never able to achieve any sort of critical mass.

## **JARON LANIER AND DIGITAL MAOISM**

External critics of Wikipedia have attacked the project on more fronts than just reliability issues. Two notable writers have leveled criticisms against Wikipedia that pertain to expertise and knowledge creation. Jaron Lanier's widely read essay "Digital Maoism: The hazards of the new online collectivism" (2006) questions some of the basic premises

of Web 2.0 and Wikipedia in particular. Andrew Keen's book *The Cult of the Amateur: How today's Internet is killing our culture* (2007) also broadly condemns the contributions of amateurs within a Web 2.0 context. The following sections examine these critics' arguments against amateurs and Wikipedia.

Jaron Lanier is known as a computer scientist, composer, visual artist, and author. He was an early pioneer in the field of virtual reality and was named one of the 100 most influential people in the world by *Time* magazine in 2010 (Lanier, n.d.). Lanier writes frequently about various aspects of digital culture, and his 2006 essay, "Digital Maoism: The hazards of the new online collectivism," written for the online magazine *Edge*, is perhaps his best-known work. The essay is a broad critique of Web 2.0. According to Lanier, Web 2.0 has in many instances led to a bland, amateur-derived online collectivism which he calls the "hive mind" that has smothered the unique and creative voices of individuals. He cites Wikipedia as one example of the dangers surrounding online collectivism:

*[T]he problem is in the way the Wikipedia has come to be regarded and used; how it's been elevated to such importance so quickly. And that is part of the larger pattern of the appeal of a new online collectivism that is nothing less than a resurgence of the idea that the collective is all-wise, that it is desirable to have influence concentrated in a bottleneck that can channel the collective with the most verity and force. (Lanier, 2006)*

Lanier questions the "wisdom of the crowds" encouraged by Web 2.0 applications, and illustrates the problems of collectivism by citing the television show *American Idol* as a prime example:

*As with the Wikipedia, there's nothing wrong with it. The problem is its centrality. More people appear to vote in this pop competition than in presidential elections ... The collective is flattered and it responds. The winners are likable,*



*almost by definition. But John Lennon wouldn't have won. He wouldn't have made it to the finals ... The same could be said about Jimi Hendrix, Elvis, Joni Mitchell, Duke Ellington, David Byrne, Grandmaster Flash, Bob Dylan (please!), and almost anyone else who has been vastly influential in creating pop music. (2006)*

Again, the argument here is that the collectivism excludes, or smothers, unique voices in favor of those that appeal to the masses.

If we look closely at the way Wikipedia articles evolve over time, does the process even fit Lanier's definition of an "online collective"? In *Here Comes Everybody: The power of organizing without organizations* (2008), Clay Shirkey argues that Wikipedia is not a collective at all:

*The people most enamored of describing Wikipedia as the product of a free-form hive mind don't understand how Wikipedia actually works. It is the product not of collectivism, but of unending argumentation. The articles grow not from harmonious thought, but from constant scrutiny and emendation. (Shirkey, 2009: 139)*

Lanier's criticisms did not escape the attention of Jimmy Wales. In one response, he actually agrees with one of Lanier's main points, but disagrees that it constitutes a problem for Wikipedia:

*One aspect of Jaron Lanier's criticism had to do with the passionate, unique, individual voice he prefers, rather than this sort of bland, royal-we voice of Wikipedia ... To that, I'd say "yes, we plead guilty quite happily. " We're an encyclopedia. (Read, 2006)*

"Digital Maoism" attracted many critical responses and Lanier seems to have weighed these opinions and softened his stance toward Wikipedia in his later book, *You Are Not a Gadget* (2010):

*While I've run across quite a few incomprehensible, terribly written passages in Wikipedia articles, on the whole there's a consistency of style. This can be either a benefit or a loss, depending on the topic and what you are after. Some topics need the human touch and a sense of context and personal voice more than others. (Lanier, 2006: 143).*

In regards to Wikipedia, Lanier's whole concept of digital Maoism is misapplied. While Maoism as an ideology did try to promote an egalitarian, classless, society it is perhaps best known for Chairman Mao's Cultural Revolution. Maoism as it was implemented through the Cultural Revolution is the furthest thing from the open, knowledge-creating community fostered by Wikipedia. The Cultural Revolution tried to create a single, nationalistic vision of China that adhered to Mao's ideology. Mao wanted to foster a revolution that derived from the people, but he used a top-down model to make it happen. Wikipedia, on the other hand, is egalitarian and democratic to a fault. Every article on Wikipedia is the result of the mixing and combining of many voices and opinions. There is no central dictator (or editor as the case may be) that tells people what to write or how to go about it.

One of the things Lanier gets right about Wikipedia is the dilemma of its meteoric rise and vast popularity: "the problem is in the way the Wikipedia has come to be regarded and used; how it's been elevated to such importance so quickly" (Lanier, 2006). Wikipedia's ease of access and place at the top of many Google search results has resulted in an increased lack of critical reading on the Web. A single example will suffice to demonstrate the dangers of not reading critically on the Web. French composer and conductor Maurice Jarre died in 2009. As an experiment, Shane Fitzgerald, a sociology student at Dublin University, quickly inserted a false, undocumented quote into Jarre's Wikipedia bio. Despite being a recent, undocumented addition, multiple large

newspapers and websites took the quote at face value and used it in their coverage of Jarre's death. Speaking about the experiment, Fitzgerald said,

*I am 100 percent convinced that if I hadn't come forward, that quote would have gone down in history as something Maurice Jarre said, instead of something I made up. It would have become another example where, once anything is printed enough times in the media without challenge, it becomes fact. (Pogatchnik, 2009)*

Lack of critical reading can certainly be a great danger within the context of an online collectivism. The problem, though, resides within the collective, not within Wikipedia. What should worry us is how the collective chooses to make use of Wikipedia and other information on the Web.

In response to Lanier's assertions about the dangers of an online collectivism and Wikipedia specifically, Jimmy Wales was on to something. An encyclopedia article is certainly not the place to encourage unique, creative writing. The great advantage of Wikipedia over traditional reference information sources lies in the fact that it is a compilation of many voices. The Web is vast and has many outlets for individual creative expression. Expression and knowledge creation on the Web is not an "either the collective/or the individual" proposition. Both can—and do—coexist quite comfortably.

## **CULT OF THE AMATEUR**

One of the most prominent critics of the amateur-driven Web 2.0 culture in general, and of Wikipedia specifically, is Andrew Keen, author of the 2007 book *The Cult of the Amateur: How today's Internet is killing our culture*. Keen is also concerned about an online collectivism—although he does not use that term—but unlike Lanier he is less concerned about creativity and individualism than he is with the debate surrounding amateurs and

experts. In the book, Keen defines an "amateur" as "a hobbyist, knowledgeable or otherwise, someone who does not make a living from his or her field of interest, a layperson, lacking credentials, a dabbler" (Keen, 2007: 36). Keen contends that the Internet (and specifically newer Web 2.0 applications) has elevated the shoddy work of amateurs at the expense of the experts:

*The cult of the amateur has made it increasingly difficult to determine the difference between the reader and writer, between artist and spin doctor, between art and advertisement, between amateur and expert. The result? The decline of the quality and reliability of the information we receive" (Keen, 2007: 27).*

At no point does Keen consider the possibility of middle ground between amateur and expert.

However, he does identify a very real problem with today's Internet culture and our ability to filter out information and opinions that are different than our own:

*Wittingly or not, we seek out information that mirrors back our own biases and opinions and conforms with our distorted versions of reality. We lose that common conversation or informed debate over our mutually-agreed upon facts. Rather, we perpetuate one another's biases. (Keen, 2007: 83)*

What Keen describes is certainly occurring and even encouraged by today's Internet (think about RSS feeds, YouTube Channels, companies and organizations you "like" on Facebook). What Keen misses is that Wikipedia is one of the few examples of a Web 2.0 application that embraces informed debate and detests bias. Recall that one of the Five Pillars that Wikipedia is founded on is "Neutral point of view." Neutral point of view is only achieved through the vigorous debates that occur on the discussion pages attached to each Wikipedia article.

Keen goes on to criticize the work of amateurs when it comes to knowledge creation:

*Without editors, fact-checkers, administrators, or regulators to monitor what is being posted, we have no one to vouch for the reliability or credibility of the content we read ... There are no gatekeepers to filter truth from fiction, genuine content from advertising, legitimate information from errors or outright deceit. (Keen, 2007: 64-65)*

The “gatekeepers” Keen is referring to are the traditional, credentialed experts, but why should we trust the gatekeepers? One of the first principles of research that librarians and professors try to instill in students is to critically assess all sources of information. The gatekeepers—the experts—often have strong biases in the way they interpret information. These biases are laid bare in the book *Information Liberation: Challenging the corruptions of information power* by Brian Martin. Martin’s arguments concerning the “corruptions of expert knowledge” are relevant here:

*[Once] a group of experts has established itself as having exclusive control over a body of knowledge, it is to their advantage to exclude nonexperts ... Most experts are full-time professionals. Those who might like to make an occasional contribution are not made welcome. Finally, many experts are arrogant, displaying contempt or hostility to amateur interlopers. (Martin, 1998: 135).*

Martin demonstrates that the politics and economics of research reinforce disciplinary expertise to the extent that it creates a system that is essentially closed to outsiders. Moreover, the expert gatekeepers that Keen puts so much stock in have been shown to be more biased than non-experts (Ericsson et al., 2006: 26-27). Academics (experts) make a career out of carving out their own niche within a profession which they lay claim to through research and publication. The openness of Wikipedia and the article review process go

a long way in eliminating expert bias. What we need to encourage is not necessarily more expert gatekeepers, but rather critical consumers of information from all sources whether it be Wikipedia, *Encyclopedia Britannica*, or Fox News.

One final assertion by Keen merits some discussion because it illuminates the role that amateurs can play in knowledge creation:

*Today, the OED [Oxford English Dictionary] and the Encyclopedia Britannica, two trusted reference volumes upon which we have long relied for information, are being replaced by Wikipedia and other user-generated resources ... Unlike the OED, which was crafted by a carefully vetted and selected team of experienced professionals, Wikipedia ... allows anyone to add and edit entries on its website. (Keen, 2007: 37).*

The origins of the *OED* are actually much closer to the Wikipedia model than the *Britannica* model. To understand why this is, one needs to understand the basic history of how the *OED* was created. The *OED* was—and still is—one of the most ambitious works of scholarship and knowledge creation ever conceived. Rather than simply defining words, the idea behind the *OED* was to create a comprehensive dictionary of the English language that provided not only definitions, but also the etymological evolution of every word over time. Changing meanings of words were to be documented through direct quotations from the earliest original sources. Richard Trench first proposed this radically ambitious project in a paper he delivered to the Philological Society of England in 1857. His speech, “On Some Deficiencies in Our English Dictionaries,” outlined the problems with current dictionaries and his vision for a new comprehensive English dictionary. The most radical aspect of his proposal is that most of English literature would have to be culled to determine the earliest usages of each word. For this immense task the Philological Society (mostly composed of amateur philologists) hoped that

“many besides its own members would gladly divide with them the toil and honour of such an undertaking. An entire army would join hand in hand till it covered the whole breadth of the island ... this drawing a sweep-net over the whole extent of English Literature.” (Winchester, 2003: 44)

This was certainly a radical departure from the way earlier dictionaries and encyclopedias had been compiled. The democratic nature of the project appealed to the members of the Philological Society “by involving in the making of the lexicon the very people who spoke and read the language, the project would be *of the people*, a scheme that, quite literally, would be classically *democratic*” (Winchester, 2003: 44). By now the similarities with Wikipedia should be apparent. In the end, the *OED* was the first large, successfully crowdsourced reference book. When the first edition of the *OED* was finally completed in 1928, it defined 415,000 words with 1.8 million quotations. The great majority of these quotations were culled from the 6 million slips of paper sent in by volunteer amateur readers (Winchester, 1998:109). The names of many of these volunteers are enshrined in the preface to each edition of the *OED* “Without regard to class or standing, qualification or creed, and certainly disregarding gender” (Winchester, 2003: 188). Nor is this reliance on amateur volunteer readers some quaint historical artifact. One can still volunteer to read for the *OED* today.

As with Wikipedia, it should be noted that the amateur volunteers who created the *OED* were not just random people off the street contributing for the heck of it. Rather, they exemplified the ethos of the amateur-expert. *OED* volunteers read in areas of literature for which they had specific interests. Likewise, Wikipedia contributors do not write and edit articles randomly; rather they focus on areas of knowledge in which they have some experience or interest. The end result, in both cases, has been the creation of two of the most significant compilations of knowledge in the English language.

## The Rise of the Amateur-Expert

Does the rise of the amateur-expert entail the decline and fall of the traditional expert? Not necessarily. Web 2.0 and amateur-experts are certainly challenging some of the roles of experts in our society but there are limitations to the reach of these challenges. Amateur-experts have had great success in leveraging the crowdsourcing model to create a massive encyclopedia and write excellent free software. Experts must cede some control over basic knowledge creation to amateur-experts. Traditional expertise will persist in some form because knowledge creation is really only a starting point. Experts are those who can take an existing body of knowledge and interpret it, synthesize it, and apply it to various contexts. For example, Wikipedia provides you with a wealth of information but it does not teach you how to actually conduct research—librarians and educators at various levels of schooling will always be needed for that task. There is an overabundance of health information on the Web, but people still trust doctors to make sense of it all and to apply that knowledge to them specifically. State and federal laws are easily accessible on the Internet, but to actually apply any knowledge of those laws in a court of law requires a level of expertise well beyond that of the amateur-expert.

## WIKIPEDIA AND ACADEMIA

From its earliest days Wikipedia and much of academia have been at odds. Academia represents one of the traditional strongholds of expertise. Expertise in academia is closely linked to the level of degree achieved (Masters, PhD, MD, etc.) and to scholarly publications. The authority of scholarly publication rests with the credentials of the author and publication coupled with a peer review process. Wikipedia's threat to this model of expertise is obvious—all its articles are anonymous and peer review is an informal

process. Furthermore, the content of Wikipedia can be freely borrowed and reused, a system that is anathema to the rigid rules that govern modern author and publisher agreements. Still, Wikipedia has tremendous potential as a pedagogical tool. Using Wikipedia articles to teach students the research process is an obvious example. Some instructors have also used Wikipedia to teach disciplinary knowledge by having students analyze and then improve specific articles. At this point, Wikipedia is not going away. If the experts still see problems with the reliability and accuracy of Wikipedia articles within their field of expertise, the best course of action is to work actively to improve them.

Wikipedia and other Web 2.0 applications have also forced universities and federal granting agencies to reconsider the traditional publishing model wherein they subsidize writing and research but then have to buy back the results of those efforts from publishers. The open access movement has gained a good deal of traction between 2006 and 2011, both in the United States and internationally. As of 2008, the published results of all research funded by the National Institutes of Health (NIH) must be made freely available in the PubMed Central Database within 12 months of publication. Various prominent universities including Harvard, Stanford, and MIT are either wholly or partially committed to open access (Open Access Directory, 2011).

Experts have also adopted some aspects of the Wikipedia model to create open access text books. The best known of these is the freely available Stanford Encyclopedia of Philosophy, which actually predates Wikipedia by about five years. This work was created and maintained entirely by experts, but is a perfect example of how experts can work collaboratively on a reference work that is not limited to libraries and individuals who can afford it. While writing about Wikipedia for *The Journal of American History*, Roy Rosenzweig summarizes this tension between the expert writers and publishers:

*Why are so many of our scholarly journals locked away behind subscription gates? What about American National Biography Online—written by professional historians, sponsored by our scholarly societies, and supported by millions of dollars in foundation and government grants? Why is it available only to libraries that often pay thousands of dollars per year rather than to everyone on the Web as Wikipedia is? Shouldn't professional historians join in the massive democratization of access to knowledge reflected by Wikipedia and the Web in general? American National Biography Online may be a significantly better historical resource than Wikipedia, but its impact is much smaller because it is available to so few people. (Rosenzweig, 2006: 137-138)*

Rosenzweig goes on to propose a “collaborative U.S. history textbook that would be free to all of our students” (Rosenzweig, 2006: 145). The Encyclopedia of Life (EOL) is a Wikipedia-like online project whose “goal is to make freely available to anyone knowledge about all the world’s organisms” (Help Build EOL, 2011). This online encyclopedia strikes a balance between Wikipedia and The Stanford Encyclopedia of Philosophy. Anyone—expert or amateur—can contribute to the EOL, but all submissions are reviewed by “expert curators” before going live on the site. One of the lasting legacies of Wikipedia will be the way it challenged traditional publishing and its role in forcing the world to consider the potential of open access publishing.

### **Whither Web 3.0?**

Web 3.0 is the supposed successor to Web 2.0 that is generally characterized by user-centered design and open participation. Librarian Steven Harris assesses Web 2.0 in the context of knowledge creation:

*That is the real purpose behind the Web 2.0 movement: to make data discoverable and usable (or*

*re-usable) by people. The synthesis of information is what expands human knowledge. Collective endeavors like Wikipedia give all individuals an opportunity to participate in that process. (Johnson, 2007: 49)*

Web 3.0 is currently an abstraction with no universally agreed-upon characteristics. Many believe that one element of Web 3.0 will be the “Semantic Web” wherein computers and networks can understand and apply information. In regards to the roles of amateurs and experts, Web entrepreneur Jason Calacanis believes,

*The wisdom of the crowds has peaked. Web 3.0 is taking what we've built in Web 2.0—the wisdom of the crowds—and putting an editorial layer on it of truly talented, compensated people to make the product more trusted and refined. (Dokoupil, 2008)*

Andrew Keen shares Calacanis's belief that Web 3.0 will be defined—in part—by a resurgence of the experts: “The future of the Internet is the combination of the traditional media expertise of Web 1.0 media with the user-generated democracy of the Web 2.0 revolution” (Keen, 2008). Perhaps another lasting legacy of Web 2.0, as exemplified by the success of Wikipedia, will be a general acknowledgement that the wisdom of the crowds is a very real and powerful phenomenon. Possibly the experts will soften their stance toward the amateurs and find more productive ways to collaborate.

## **CONCLUSION**

What is knowledge? How do we know that we know? What is truth?

The radical nature of Wikipedia lies in how it has answered these epistemological questions. Wikipedia has been a major player in redefining knowledge and expertise in the 21st century. To borrow an example from linguistics, we know a

tree is a tree because that is the commonly agreed-upon term in English. Wikipedia has shown us that knowledge need not come only from experts. The wisdom of the crowds has created an ever-changing base of collective knowledge in the form of Wikipedia. Larry Sanger again best addresses these epistemological questions:

*Wikipedia is a global project. Its special feature is that no one is privileged, and over time, the views of thousands of people are weighed and mixed in. Such an open, welcoming, unfettered institution has a better claim than any other to represent the consensus of Humanity. (Sanger, 2009: 58)*

Although Sanger does not say it explicitly, the “consensus of humanity” could be one definition of truth. Truth on Wikipedia is a never-ending process of argument and compromise.

The wisdom of the crowds as exemplified by Wikipedia appears to be a new form of expertise. In reality, the wisdom of the crowds is as old as humanity. It is part of the reason that people have always formed communities. For most of history, the wisdom of the crowds was limited to those with close physical proximity. The *Oxford English Dictionary* was the first major information source to successfully tap the wisdom of the crowds over a large geographical area. The Internet and Web 2.0 applications such as the wiki have removed geographical barriers and greatly simplified the process of crowdsourcing. In our global society, the wisdom of the crowds will continue to be a major source of knowledge creation.

In Europe during the Middle Ages, the Church and its “experts” tightly controlled accepted knowledge. Championing science and reason, the Enlightenment challenged and usurped the Church as the universal source of knowledge. Following the Enlightenment, expert knowledge has been controlled and meted out by universities and professional organizations. For the last 300 years or so, there have not been any significant challenges to expertise. Neither radio nor televi-

sion posed a major threat. In an incredibly short time, the Internet, and specifically Web 2.0 applications such as Wikipedia, have forced a radical rethinking of expertise.

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## KEY TERMS AND DEFINITIONS

**Amateur:** A non-professional who engages in an area of study as an unpaid hobby or pastime.

**Amateur-Expert:** Someone who has gained a great deal of specialized knowledge through study or practice, but lacks traditional academic or professional credentials.

**Crowdsourcing:** Outsourcing a task or project to a large, undefined, group of people.

**Egalitarianism:** A social philosophy that advocates for a classless society and equal rights for all.

**Epistemology:** The philosophical study of knowledge and the theory of knowledge.

**Expert:** A person who has obtained academic or professional credentials and a comprehensive and authoritative knowledge in a particular area.

**Reliability:** A comparative, rather than absolute, quality indicating a consistently high degree of accuracy versus error.

**Web 2.0:** The second generation of web services characterized by a focus on user participation, collaboration, and interaction.