

WIKIPEDIA'S ECONOMIC VALUE

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In the copyright policy debate, proponents of strong copyright protection tend to be dismissive of the quality of freely available content. In response to counter-examples such as open access scholarly publications and advertising-supported business models (*e.g.*, newspaper websites and the over-the-air television broadcasts viewed by 50 million Americans), the strong copyright proponents center their attack on amateur content. In this narrative, YouTube is for cat videos and Wikipedia is a wildly unreliable source of information.

Recent studies, however, indicate that the volunteer-written and -edited Wikipedia is no less reliable than professionally edited encyclopedias such as the Encyclopedia Britannica.¹ Moreover, Wikipedia has far broader coverage. Britannica, which discontinued its print edition in 2012 and now appears only online, contains 120,000 articles, all in English. Wikipedia, by contrast, has 4.3 million articles in English and a total of 22 million articles in 285 languages. Wikipedia attracts more than 470 million unique visitors a month who view over 19 billion pages.² According to Alexa, it is the sixth most visited website in the world.³

Wikipedia, therefore, is a shining example of valuable content created by non-professionals. Is there a way to measure the economic value of this content? Because Wikipedia is created by volunteers, is administered by a non-profit foundation, and is distributed for free, the normal means of measuring value—such as revenue, market capitalization, and book value—do not directly apply. Nonetheless, there are a variety of methods for estimating its value in terms of its market value, its replacement cost, and the value it creates for its users. These methods suggest a valuation in the tens of billions of dollars, a one-time replacement cost of \$6.6 billion with an annual updating cost of \$630 million, and consumer benefit in the hundreds of billions of dollars.

¹ See Natalie Wolchover, "How Accurate is Wikipedia?," *livescience*, Jan. 24, 2011, <http://www.livescience.com/32950-how-accurate-is-wikipedia.html>, for a discussion of studies demonstrating the reliability of Wikipedia.

² The number of unique monthly visitors is estimated by Comscore. The actual number of unique monthly visitors probably is higher because Comscore does not count mobile visits. For purposes of this paper, we will assume that the Comscore number is accurate. The number of page views comes directly from Wikimedia and thus is more reliable.

³ Alexa bases its ranking on a combination on the number of visitors and page views.

MARKET VALUE

Enrique Bonson and Francisco Flores, business professors in Spain,⁴ published a 2012 article attempting to place a market value on Wikimedia, the non-profit foundation that owns Wikipedia.⁵ They suggested using online relevance and reputation as drivers to estimate Wikimedia's market value. They compiled a table of the top websites, including Wikipedia, and detailed their reputations as calculated by Alexa. Reputation is based on how many other sites linked to the site. The table also reflected the number of unique visitors the site received in July 2011. They stated that "if we take into account online relevance and how it correlates with market value, then it is possible to interpolate some value interval." They observed that the reputation of Wikipedia (2,190,757) is between LinkedIn (1,310,911) and Twitter (6,221,109). At the same time, Wikipedia had more unique visitors (410 million) than either Twitter (160 million) or LinkedIn (80 million) but fewer than Facebook (880 million). Noting the market capitalization of these other entities (Facebook at \$60 billion and LinkedIn at \$10 billion), Bonson and Flores concluded that "Wikimedia should be valued between \$10 and \$30 billion."

Bonson and Flores also estimated how much users would have to pay for Wikimedia's services if they weren't free. They noted the Internet has numerous online fee-based reference services such as Britannica (\$130-\$170 per year) or Last.fm (\$36 per year). They assumed that if Wikipedia began charging for its services, it would lose over 75% of its visitors. But if 100 million customers paid an annual fee of \$36, that would translate into \$3.6 billion in revenue. And if these users paid the fee Britannica charges, the revenue could go as high as \$17 billion.

Business analysts often estimate the value of a company by multiplying its revenue by an appropriate industry ratio. *Business Insider*, in a 2008 profile on Wikipedia, suggested a ratio of 20.⁶ Using this ratio, the market value of Wikipedia would range between \$72 billion (\$3.6 billion * 20) and \$340 billion (\$17 billion * 20). A more conservative market value to revenue ratio for Internet companies, generated by Reuters,⁷ still results in a market value between \$21.1 billion (\$3.6 billion * 6) and \$102 billion (\$17 billion * 6).

Vincent Juhel, in a master's thesis for HEC Paris on the economic value of Wikipedia, estimated the amount of advertising revenue Wikipedia could

⁴ Enrique Bonson is a professor of accounting at the University of Huelva and Francisco Flores is a professor of business administration at the Iriarte School of Tourism and Management in Tenerife.

⁵ Enrique Bonson and Francisco Flores, "Placing a Valuation on Wikimedia," *Online* 36(5), Sept. 2012.

⁶ "Wikipedia," *Business Insider*, Mar. 28, 2008, <http://www.businessinsider.com/companies/wikipedia>.

⁷ Thomson One Banker, "Fundamentals Comparables" to Google.

generate if it allowed advertising on its pages.⁸ At \$8 in advertising revenue per 1000 page views (RPM), Wikipedia could generate \$1.6 billion annually. Using a discounted cash flow methodology, Juhel arrived at a market value of \$8.8 billion.⁹

The *Business Insider* profile mentioned above indicates that, depending on the website, RPM varies from \$1 to \$20. It assumed that Wikipedia could generate an RPM of \$5. With 70 billion page views in 2008, this would have yielded advertising revenue of \$350 million (70 billion * \$5/1000) and a market value of \$7 billion (\$350 million * 20). At the current annual rate of 212 billion page views, the *Business Insider* method would result in a market value of \$21.2 billion.

The *Business Insider* profile referenced an analysis by venture capitalist Dan Malven, who believed that Wikipedia could generate an RPM of \$10.¹⁰ With 212 billion annual page views and a market value to revenue ratio of 20, Wikipedia's market value would climb to over \$40 billion.

Other methodologies for estimating advertising revenue yield even higher results than the *Business Insider* approach. The average click-through rates and cost per click of Yahoo, Google, Facebook, and LinkedIn¹¹ yields \$4.3 billion in advertising revenue (212 billion pages views * 1.4% click-through rate * \$1.46 cost per click). Using the 20:1 market value to revenue ratio noted above, the \$4.3 billion in revenue translates into a market value of \$86 billion.

Of course, any effort to monetize Wikipedia through advertising would run the risk of driving away the volunteer contributors and editors that create the content. Malven addressed this concern by suggesting that Wikipedia donate the revenue it generated to charitable causes. According to Malven, "the contributors

⁸ Vincent Juhel, "Valorisation du benevolat sur Wikipedia" (2011), <http://www.amplyd.com/these/Valorisation%20du%20b%C3%A9n%C3%A9volat%20sur%20Wikip%C3%A9dia%20-%20FEB2012%20-%20Vincent%20Juhel.pdf>.

⁹ This valuation is similar to the \$5 billion valuation proposed in 2006 by blogging entrepreneur Jason Calacanis. Michael Snow, "Hypothetical valuation of Wikipedia scrutinized," *Wikipedia Signpost*, Oct. 30, 2006, https://en.wikipedia.org/wiki/Wikipedia:Wikipedia_Signpost/2006-10-30/Wikipedia_valuation.

¹⁰ Dan Malven, "Wikipedia Should Go For-Profit, Give Profits Away," *Business Insider*, Mar. 12, 2008, <http://www.businessinsider.com/2008/3/better-idea-for-wikipedia-go-private-give-away-profits>

¹¹ Facebook rates are from <http://www.cmswire.com/cms/customer-experience/customers-like-facebook-mobile-ads-016457.php> and <http://www.insidefacebook.com/2012/04/04/survey-suggests-facebook-advertising-benchmarks-0-80-cpc-0-014-percent-ctr/>; LinkedIn rates are from <http://howtomarketsoftware.com/case-study-my-experiment-with-linkedin-advertising.html>; and Google and Yahoo rates are from http://succeed.adgooroo.com/rs/adgooroo/images/AdGooroo_Yahoo_Bing_PPC_Performance_Metrics.pdf?mkt_tok=3RkMMJWWfF9wsRohs6XKZKXonjHpfsX54u4tWaC%2BIMI/0ER3fOvrPUfGjI4HRctHl%2BSLDwEYGIv6SgFQ7XMMa9p17gLUxQ%3D.

that create the Wikipedia properties would contribute even more passionately because it is for the common good.”

However, whether Wikipedia could in fact be converted into what Malven termed “a real-world perpetual money machine” for charity is beside the point for purposes of this paper. Here we are just trying to estimate the value of the Wikipedia asset.

The wide range in possible market values is not surprising. The revenue per thousand page views could be anywhere between \$1 and \$20. Likewise, the market value to revenue ratio could be as low as 2 and as high as 25. Nonetheless, the basic point is the same: a website with over 200 billion page views is potentially worth tens of billions of dollars.

REPLACEMENT COST

Another approach for determining the value of Wikipedia is to estimate the cost of replacing it. Assuming that a freelance writer would charge \$300 to write an article the length of an average Wikipedia article,¹² the one-time replacement cost of Wikipedia would be \$6.6 billion (22 million articles * \$300).

R. Stuart Geiger and Aaron Halfaker¹³ estimated the total labor hours invested through 2012 in creating English Wikipedia using the metric of the length of edit sessions by editors. “Summing the duration of all continuous editing sessions and single edit sessions, we identified 41,018,804 total labor-hours expended in the English-language version of Wikipedia.”¹⁴ If a freelance writer charged \$50 an hour to write a Wikipedia article,¹⁵ the one-time replacement cost would be \$2.05 billion for English Wikipedia (41 million hours * \$50/hour) and \$10.25 billion for all of Wikipedia.

Wikipedia, however, is not a static website; it is constantly improving and expanding. Juhel estimated that, based on the rate of growth of French Wikipedia and the average amount of time it takes to write or update an article, updating French Wikipedia would require 900 full-time writers at the average monthly salary of 3,000 Euros. This would cost 32 million Euros a year.¹⁶ French Wikipedia comprises 6.8% of Wikipedia. Extrapolating the 32 million Euros annual updating cost of French Wikipedia to all languages results in a cost of \$630 million a year to update all of Wikipedia.

¹² http://www.writersmarket.com/assets/pdf/How_Much_Should_I_Charge.pdf.

¹³ R. Stuart Geiger is a Ph.D student at UC-Berkeley’s School of Information. Aaron Halfaker is a Ph.D student in computer science at the University of Minnesota.

¹⁴ R. Stuart Geiger and Aaron Halfaker, “Using Edit Sessions to Measure Participation in Wikipedia,” http://www-users.cs.umn.edu/~halfak/publications/Using_Edit_Sessions_to_Measure_Participation_in_Wikipedia/geiger13using-preprint.pdf

¹⁵ http://www.writersmarket.com/assets/pdf/How_Much_Should_I_Charge.pdf.

¹⁶ Juhel at 16.

CONSUMER VALUE

Bonson and Flores mention that Wikipedia has positive economic externalities—benefits that accrue to a person from an activity or transaction he did not pay for. If we try to estimate Wikipedia's positive externalities using Bonson and Flores' numbers above, we would not discount the 75% of users who might not pay a subscription fee. All users are receiving the benefit of accessing Wikipedia. Thus, the annual positive externality of Wikipedia ranges from \$16.9 billion (470 million users * \$36 subscription fee) to \$80 billion (470 million users * \$170 subscription fee).

Even these large numbers might understate the positive externalities of Wikipedia. English Wikipedia has almost 40 times as many articles as Britannica and thus might be "worth" far more to the user than the \$170 Britannica subscription.¹⁷

On the other hand, many users might visit Wikipedia only a few times a year, and the \$170 Britannica subscription fee might not be an appropriate measure of the value they receive. Fortunately, library systems, in an effort to calculate the value they provide their users, have developed estimates for the value of answering reference queries. These estimates are based on the average amount of time it takes to answer a query multiplied by the hourly salary of a reference librarian. For example, the Bureau of Business Research of the IC2 Institute at the University of Texas at Austin, in a study prepared for the Texas State Library and Archives Commission, determined that the average value of a reference question answered at a Texas public library would be approximately \$2.25.¹⁸ The study's authors recognized that this value was "extremely conservative." They noted that most online library service value calculators estimate the value at \$7.00 per question, while the state of Maine estimated the value at \$15.00, and the National Network of Libraries of Medicines estimated the value at \$45.00.

Wikipedia does not track the number of unique research sessions conducted on its site. However, as noted above, there are on average 470 million unique visitors a month, and a total of 19 billion page views a month. During the course of a month, a given user might visit Wikipedia several times to research different questions. One research session could involve several page views until the user finds the answer to his question. We can assume that there are at least two billion research sessions a month on Wikipedia, i.e., that on average a user will conduct four research sessions a month with approximately 10 page views per session. Using the "extremely conservative" Texas library value per reference question, the value of answers provided by Wikipedia per year is \$54 billion (2 billion

¹⁷ Although Bonson and Flores listed a Britannica subscription fee of \$170, the fee currently listed on the Britannica website is \$70.

¹⁸ Bureau of Business Research, IC2 Institute, University of Texas, "Texas Public Libraries: Economic Benefits and Return on Investment," 2012, at 44, [https://www.tsl.state.tx.us/sites/default/files/public/tslac/news/docs/2013releases/pressrelease_2.4BillionFromTexasLibraries_1.11.13.pdf?utm_source=WhatCountsEmail&utm_medium=Geek the Library&utm_campaign=Geek the Library](https://www.tsl.state.tx.us/sites/default/files/public/tslac/news/docs/2013releases/pressrelease_2.4BillionFromTexasLibraries_1.11.13.pdf?utm_source=WhatCountsEmail&utm_medium=Geek%20the%20Library&utm_campaign=Geek%20the%20Library).

sessions * 12 months * \$2.25 per question). If the value estimated by the National Network of Libraries of Medicine is used, the value increases to \$1.08 trillion (2 billion sessions * 12 months * \$45.00 per question).¹⁹ Using the more moderate Maine public library value of \$15 per question yields a value of \$360 billion (2 billion sessions * 12 months * \$15.00 per question). This number doubles to \$720 billion if we assume that the average research session involves only five page views rather than 10, meaning that there are 4 billion sessions a month on Wikipedia (4 billion sessions * 12 months * \$15.00 per question).

CONCLUSION

Wikimedia's annual operating budget is approximately \$25 million, which covers storage, bandwidth, and administrative costs. The millions of hours contributed by volunteer writers and editors leverage this modest budget, funded by donations, into an asset worth tens of billions of dollars that produces hundreds of billions of dollars of consumer benefit. Wikipedia demonstrates that highly valuable content can be created by non-professionals not incentivized by the copyright system.

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¹⁹ The highly specialized nature of the questions fielded by medical reference librarians suggests that the value of answers provided by Wikipedia should be closer to the public library value of \$2-\$15 per question than the medical library value of \$45.