

# Wikis and Public History – A Case study of the IEEE Global History Network

Nathan Brewer

## Abstract

This paper measures the behavior of users of the IEEE Global History Network (GHN), a semi-open wiki with a focus in the history of electrical engineering. The MediaWiki software platform allows for the easy exhibition of thousands of documents, and is a viable method for the publication of public history. The GHN was initially opened to IEEE members and received limited engagement from the public. Usability studies were conducted on the site, and it was found that users contribute wikis when they have above average knowledge in a specific subject, and when there are limited barriers to participation. In order to expand its potential contributor base and limit barriers to access, the IEEE partnered with six other engineering societies to expand the site's scope to all engineering, and to encourage members of the technically literate general public, including historians and hobbyists, to contribute.

## Background

The IEEE Global History Network (GHN) is a semi-open Wiki launched in 2008 by the IEEE History Center to replace the center's previous public website, the IEEE Virtual Museum. Members of the IEEE History Committee, the governing volunteer body over the IEEE History Center, felt that the user-generated content model of wikis would better serve the public.<sup>1</sup> The GHN is the History Center's main vehicle for the publication and exhibition of its articles and collections. The IEEE History Center's mission statement is to promote and disseminate the history of electrical engineering and its related fields. The Center's work is generally focused towards a public history audience, and the content of the GHN is mostly oriented at the technically literate public. The largest body of content on the GHN is a set of encyclopedic articles, approximately 3,000. This content was initially seeded with the Virtual Museum's articles, which had been written by the Center staff, and has grown to the present number over time. Staff have continued to write the bulk of the articles, as will be discussed below. The encyclopedic portion of the site functions like traditional wikis in that users can collaboratively edit articles together. The GHN also houses controlled documents which can only be edited by their author or a site administrator, such as First Hand Histories, Oral Histories, and archival documents. The IEEE Milestones program, also hosted on the site, is a formal recognition program operated by the IEEE History Committee.

The GHN runs on MediaWiki, the same software package used by the Wikimedia Foundation, the governing body over Wikipedia, Wikisource, Wikimedia Commons and several other sites.<sup>2</sup> Upon initial launch of the GHN, assessment of the quality of incoming articles was a concern.

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<sup>1</sup> Gowen, Richard, (2008) "History of the GHN", Retrieved October 3<sup>rd</sup>, 2014, [http://www.ieeeghn.org/wiki/index.php/First-Hand:History\\_of\\_the\\_GHN](http://www.ieeeghn.org/wiki/index.php/First-Hand:History_of_the_GHN)

<sup>2</sup> MediaWiki, Retrieved September 22<sup>nd</sup>, 2014, <https://www.mediawiki.org/wiki/MediaWiki>

Critics of the Wikipedia project note that as opposed to the traditional print encyclopedia model of commissioning articles from subject matter experts, crowd-sourced open contributions can introduce deliberate vandalism or inadvertent errors to articles.<sup>3</sup> For this reason, concern over the potential lack of quality to come from the general public, the site initially required users to be an IEEE member to create an account, authenticating through the IEEE account database, or else to be an invited guest.

IEEE has over 400,000 members worldwide, and early estimates of user participation were very high, and have proven to be overly optimistic. MediaWiki was selected for a software package due to its demonstrated ability to handle thousands of users on the Wikimedia Foundation websites. In addition, MediaWiki is generally considered to be a very usable piece of software. Controlled studies have shown that non-technical users, including young children, can easily contribute content to MediaWiki-based sites, and that most technical difficulties arise from internal link management.<sup>4</sup>

### **Wiki Behavior and Engagement**

When accessing a wiki, the behavior of users can be split into two categories, those who come to the site to read its content, and those who come to the site to contribute content. The vast majority of users only use wikis to read content, not to edit. Users who are inclined to register for accounts to edit wikis typically have above average knowledge in the specific subject area.<sup>5</sup> As the scope of the GHN is the history of electrical engineering and its related technologies, the users most likely to edit the GHN are people with above average knowledge in the history of electrical engineering. IEEE is an organization primarily focused on currency. A vast majority of IEEE publications are technical papers which discuss the latest advancements in certain fields. History articles comprise less than one tenth of one percent of IEEE's total publication body.<sup>6</sup> Many IEEE members who develop an interest in the history of their fields do so after retirement.

In 2010 the IEEE History Center conducted a usability study on the GHN in order to gauge how the general public views the site, and how easy the site was to navigate. Sixteen participants were recruited to participate, 6 of them being IEEE members who have published an article, 5 IEEE members who have not published an article, and 5 tech-savvy non-members. The members surveyed ranged in age from 21 to 64 and while all of them thought the content looked interesting, they all said they would not contribute to the website as they felt that did not know enough about the subject matter. The non-members felt that the site was interesting and

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<sup>3</sup> De la Calzada, G., Dekhtyar, A., (2010) "On Measuring the Quality of Wikipedia Articles", *Proceedings of the 4th Workshop on Information Credibility (WICOW'10)*

<sup>4</sup> Désilets, A., Paquet, S., Vinson, N. (2005). "Are Wikis Usable?", *WikiSym '05: Proceedings of the 2005 international symposium on Wikis*

<sup>5</sup> West, R., Weber, I., Castillo, C., (2012) "Drawing a Data-Driven Portrait of Wikipedia Editors", *WikiSym '12: Proceedings of the Eighth Annual International Symposium on Wikis and Open Collaboration*

<sup>6</sup> Brewer, N., Colburn, R. (2013). "History Articles in IEEE Publications", Retrieved October 3<sup>rd</sup>, 2014, [http://www.ieeeghn.org/wiki/index.php/Archives:History\\_Articles\\_in\\_IEEE\\_Publications](http://www.ieeeghn.org/wiki/index.php/Archives:History_Articles_in_IEEE_Publications). From the IEEE Xplore Database, <http://ieeexplore.ieee.org/Xplore/home.jsp>, as of October 3<sup>rd</sup>, 2014, there were 3,815,492 articles listed.

informative, but were confused about the IEEE specific terminology. None of the non-members knew what IEEE was and based on the name “IEEE Global History Network” did not associate this with the history of technology and engineering.

The usability study highlighted several key issues that needed to be addressed going forward. Given that a small subset of IEEE members are likely to be knowledgeable about the history of the technology, eligibility for an account needed to be expanded beyond IEEE in order to best engage with audience with appropriate subject matter expertise. In 2011 membership to the site was expanded to the general public, with the hope of attracting academic and amateur historians, including hobbyists. While several hundred non-IEEE members have registered for accounts, a small percentage of these have made any edits to the website. People sign up to edit wikis for a number of different reasons, four of the largest areas consist of substantive experts, people who are subject matter experts and the majority of content creators; technical editors, people who correct minor issues; counter vandalism, people who patrol pages for disruptive edits; and social networks, people just there to join a community.<sup>7</sup>

The GHN’s public editor base, editors not directly affiliated with the IEEE History Center staff, is solely composed of substantive experts, who most frequently contribute content in IEEE-related areas. IEEE is broken up into several hundred geographic sections, and several dozen technical societies. The generation and maintenance of the pages which detail the history of these organizational units has been by far the most successful area of engagement. Users who edit in this area are typically section or society officers who both have a vested interest in their unit, and have close access to the people and documents involved. Participation in the IEEE Milestones program has been the second most popular area of contributing content to the GHN. Since launch, more than 90 of the Milestones have been submitted through the website’s platform, and the IEEE History Committee, a standing volunteer committee of the IEEE Board, uses the discussion feature on the site to conduct its review process. First Hand Histories, especially those generated by special projects and collection efforts have yielded numerous submissions. The most successful projects in collecting First Hand Histories was solicitation to all members of IEEE who had been with the organization over 50 years. This base consists of approximately 9,000 members, and each was contacted via email. Approximately seventy memoirs were received through this call, mostly through documents sent via email, or paper documents sent physically to the History Center.

Contributions in areas not specific to IEEE, such as general history articles on various technologies, have been less successful. Good encyclopedic articles have been generated by non-IEEE staff through the regular component of the site, and through the STARS Program, an official IEEE program which aims to collect peer-reviewed encyclopedic articles. While the quality of these articles tends to be high, they are small in number, consisting of approximately

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<sup>7</sup> Welser, H., Cosley, D., Kossinets, G., Lin, A., Dokshin, F., Gay, G., Smith, M. (2011) Finding Social Roles in Wikipedia. *iConference*

1% of total documents on the GHN. The website's initial focus on IEEE members had the potential to alienate potential subject experts who were not IEEE members. Furthermore, non-IEEE members were under the impression that one needed to be an IEEE member to just access and read the content on the site. Applying for a guest account to the GHN was possible, but it a complicated and involved process that usually took up to a week's time. User participation in wikis has been demonstrated to increase with fewer barriers to access,<sup>8</sup> and content contributors are most motivated to contribute to a site by personal enjoyment.<sup>9</sup> Confusion about the site's scope, purpose and ability to log in can create frustration for the users who would otherwise have something potentially valuable to contribute to the site, and could drive them away.

## Reassessment

In order to overcome these barriers, radical changes needed to be made to the GHN. One of the top level recommendations from the 2010 usability study was to completely rebrand the site to steer away from its IEEE focus. While this was not possible in 2010 due to various outstanding technical issues, over the course of the next couple years the site was thoroughly reviewed, stabilized and made bug-free. With a fully functional site, the IEEE History Center approached the United Engineering Foundation for a seed grant to determine if there was interest amongst other engineering societies for partnering with the IEEE History Center to rebrand and expand the site. Interest amongst the Founder societies, as well as the Society of Petroleum Engineers (SPE) and the Society of Women Engineers (SWE) was strong, and funding was awarded for the IEEE to rebrand the GHN. The American Institute of Chemical Engineers (AIChE), American Institute of Mining Engineers (AIME), American Institute of Civil Engineers (ASCE), SPE, and SWE have all agreed to participate in launching of the new expanded site in 2015, the Engineering and Technology History Wiki (ETHW).

Many subjects in engineering overlap with one another, and focusing just on electrical engineering can be restrictive, both in content scope and user base. With the agreements with the ETHW partnering societies, the electrical engineering focus of the GHN will expand into a pan-engineering focus on the ETHW, allowing subject matter experts in non-electrical technologies to be able to contribute to the new site. In order to better reach the public, the site's new name "Engineering and Technology History Wiki" tells the user upfront what the site's purpose is – it is a wiki for the history of engineering and technology. Lengthy acronyms in the site name and the various programs typically confuse users and decrease their time spent on site. Keeping the site as simple and straightforward as possible has been demonstrated to be the most efficient way in keeping users on the site.<sup>10</sup> Account creation will be fully open to the general public, and it will be stressed that the site is not just for members of engineering societies, but that contributions from all are welcome.

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<sup>8</sup> Roth, C., Taraborelli, D., Gilbert, N. (2008) "Measuring wiki viability: An Empirical Assessment of the Social Dynamics of a Large Sample of Wikis", *WikiSym '08: Proceedings of the 4th International Symposium on Wikis*

<sup>9</sup> Nov, O. (2007). "What Motivates Wikipedians?", *Communications of the ACM*, vol. 50, no. 11

<sup>10</sup> Evellin, B. (2012) "Is My Grandmother able to Contribute?", *Wikimania 2012*

Even with a greatly expanded scope and clearer name, driving user participation to the new site will be a challenge. The rationale “Build it and they will come” is often used as methodology for userbase growth in new wikis, including Wikipedia itself.<sup>11</sup> However, this method has been shown to be successful in only Wikipedia’s early days when there was a great deal of low-hanging fruit content to be generated. Wikipedia’s high visibility on the internet at large will intrinsically drive a high amount of traffic to it. The same is not true for smaller wikis with a more niche focus. Serendipitous growth is a poor method content generation for smaller platforms like the ETHW. In a 2013 survey of the content interests of people who contribute to wikis, television and music ranked highest and drew approximately ten times the interest than technology-related topics.<sup>12</sup> Size of wikis and userbases can be measured in a number of different metrics, one of which is total edits on the site. This gives an indication of user interaction and participation on various sites. The largest wikis by total edits not run by the Wikimedia Foundation are Wikia sites, a free platform which allows anyone to set up their own specialty wiki. The largest of these are the Lyrics wiki, the Runescape Wikia and Star Wars Wikia sites. None of the largest 200 wikis have a specific technology or history focus.<sup>13</sup>

Going forward, the ETHW council, the representative body of the member societies that govern the site, will have to actively conduct outreach to its societies’ members and outwards in order to build a healthy community. Several ways of active engagement have been identified for the Wikipedia project,<sup>14</sup> which can be applied to the ETHW. In order to have the maximum impact, the ETHW council will have to push outside its members to cultural institutions as well as scholars and academics. The ETHW differs from other wikis in that it houses more than encyclopedia style articles. Wikimedia Foundation projects such as the GLAM (Galleries, Libraries, Archives and Museums) Initiative have been successful in obtaining images for Wikimedia Commons,<sup>15</sup> and a similar approach to the ETHW could net significant contributions in the form of not just images, but also paper archival documents, memoirs and audiovisual material. Scholars and academics, in addition to amateur historians and hobbyists, are likely to be the most knowledgeable audience and the most capable of synthesizing a well written encyclopedic article from primary and secondary sources. Making membership easier to obtain has a demonstrated effect of both increasing the size of the community, but also in decreasing ownership issues; the more open a wiki is, the more people are willing to work collaboratively

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<sup>11</sup> Yuan, T., Crowley, J., Asunka, S., Chae, H.S., Natriello, G. (2010) “Build It and They Will Come?: A Case Study of the Use of a Wiki in a Higher Education Research Unit”, *International Conference on E-Learning in the Workplace 2010*

<sup>12</sup> Lim, K.H., Datta, A. (2013), "Interest Classification of Twitter Users using Wikipedia", *WikiSym '13: Proceedings of the 9th International Symposium on Open Collaboration*

<sup>13</sup> Wikimedia Labs, “List of Largest Mediawikis”, retrieved September 22<sup>nd</sup>, 2014, <http://wikistats.wmflabs.org/largest.html.php>

<sup>14</sup> Lih, A. (2012) "Engage or Perish", *Wikimania 2012*

<sup>15</sup> Wikimedia Foundation, “GLAM-Wiki Initiative”, retrieved September 22<sup>nd</sup>, 2014, <https://en.wikipedia.org/wiki/Wikipedia:GLAM>

with one another.<sup>16</sup> Active engagement through this kind of outreach, grants and interns will be the only way to ensure long term success of the site.

The launch of the ETHW not only aims to increase its base of contributors, but also aims to further engage with its readers. Removing IEEE-specific language, using direct names for content types as opposed to obfuscated acronyms, and simplification of the site's layout will serve to enhance the end user's experience on the site. 10% of users view the GHN on a mobile platform, and mobile capabilities will be added to the site in order to enhance users browsing experiences. Content will be indexed in a much more straightforward fashion with simple terms that will be more likely to resonate with the general public. Unique visitors and pageviews have consistently trended up on the GHN throughout the past six years, and is also expected to do so as the ETHW.

## **Conclusion**

Using wikis for the exhibition and publication of historical materials can be an easy way to publish a large body of content so it is readily accessible to the public. MediaWiki is a versatile software package which allows the easy use and administration of thousands of documents, ranging in type from encyclopedic articles to archival documents, as well as thousands of users. User participation in the content generation of wikis is primarily driven by people with a substantive expertise in a particular subject. Compared to Wikipedia's "the sum of all human knowledge", history is a niche subject area, and history of technology moreso. The serendipitous "build it and they will come" model of content generation typically does not work for smaller wikis with a niche subject area. Outreach and an open userbase are the most successful factors in driving editors to wikis. Targeted solicitation to subject matter experts in the history of engineering and technology, including historians of technology, hobbyists, and engineers, has been the most productive source of content for the GHN, and outreach to amateur and academic historians beyond the societies' memberships will essential to the long-term growth of the ETHW.

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<sup>16</sup> Guth, S. (2007) "Wikis in Education: Is Public Better?", *WikiSym '07: Proceedings of the 2007 international symposium on Wikis*