



Article

Google Wave: Have CTSA-Minded Institutions Caught It?

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Received: 26 July 2010

Accepted: 02 Nov. 2010

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Abstract

Background - Google Wave was touted as the next big communication tool— combining e-mail, social networking, and chat within a single “wave” — with the potential to create a new world for collaboration. Information professionals who are knowledgeable of this tool and its capabilities could become uniquely situated to use it, evaluate it, and teach it. This seemed especially true for those working within Clinical and Translational Science Award (CTSA)-minded institutions, given the promise of interdisciplinary collaboration between investigators and the potential for creating new authorship models. This case study on Google Wave users who are affiliated with CTSA-minded institutions, was designed for and presented at the Evidence-Based Scholarly Communication Conference held by the University of New Mexico Health Sciences Library and Information Center. It provides an early evidence based evaluation of Google Wave’s potential.

Methods - Two “waves” were created. The first consisted of five survey questions designed to collect demographic data on the respondents’ roles, a general impression of Wave, the specific tools within Wave that might be useful, and potential collaborators with whom the respondents might use Wave. The second wave was a private, guided discussion on Wave’s collaboration potential. Individuals from CTSA-minded institutions were invited to participate with messages on Twitter, forums, blogs, and electronic mail lists, although there were difficulties reaching out to these institutions as a group.

Results - By the conclusion of the study, only a small number of people (n=11, with a viable n=9) had responded to the survey. Given this small result set, it made sense to group the responses by the respondents' roles (CTSA staff and researchers, support staff, medical librarian, or general public) and to treat them as individual cases. Most of the respondents were librarians and support staff who felt that Wave might have potential for collaboration; there were no CTSA researcher respondents. For the second part of the study, the discussion wave, only one participant explicitly expressed interest in joining. All were invited to join, but there was no participation in the discussion wave at the conclusion of the study.

Conclusions -The results of this study implied that Google Wave was not on the forefront of CTSA-minded institutions' communication strategies. However, it was being used, and it did demonstrate new collaboration and authorship capabilities. Being generally aware of these capabilities may be useful to information professionals who seek to be current and informed regarding developing technology and to those interested in scholarly communication practices. In addition, the difficulties encountered during this case study in attempting to reach out to CTSA-minded institutions raised the question of how members currently communicate with each other as institutions and as individuals. There was a lesson learned in the usefulness of doing case-study research to evaluate new technologies; the cost in terms of time was relatively low, and knowledge about the technology itself was gained while establishing a base level of evidence to potentially build on in the future.

Background

Google announced Google Wave to the world on 28 May 2009 (Google, 2009a). After a few months of additional development, it was released to a group of more than 100,000 people on 30 Sept. 2009 (Rasmussen, 2009). In the months after the initial release, the number of users on Wave grew substantially. Google first extended additional invitations, and then opened the service to anyone who had or was interested in registering for a Google account. Many touted the service (Google, 2009b; McCracken, 2009; Siegler, 2009) as the next big communication tool, combining e-mail, social networking, and chat with other online tools. Potentially, it seemed Google Wave could change the face of collaboration, greatly impacting the world of scholarly communication.

What Is Google Wave?

Explaining Google Wave is complicated by its jargon-rich terminology and a lack of the usual Google intuitiveness; the following explains some of the major key terms. The main

components of Google Wave are its "waves." In writing, the standard is to capitalize the "W" when referring to the service, and to use the lowercase when referring to the objects. The waves are blank canvases for text and embedded objects such as videos, pictures, or documents. The waves are an answer to one of e-mail's biggest problems: the number of ever growing and ever changing versions that occur when e-mails go back and forth. In other words, a wave can be thought of as a single conversation that can be edited and added to by participants; everyone is looking at the same copy. All revisions are tracked and visible in a playback mode. A few more key terms are worth noting: a "blip" is a reply within a wave, "gadgets" are small applications that add interactive content to a wave, and "bots" are automated robots that execute commands within a wave. A wave is "public" if it can be found and joined by anyone, and a "private" wave is a wave where only invited participants can join and interact. Trapani and Pash (2009) go into further detail on Wave's capabilities and the vocabulary used to describe them in their book, *The Complete Guide to Google Wave*.

Google Wave, Information Professionals, and Clinical and Translational Science

Librarians and information professionals may want to be aware of Wave and its capabilities as it can be argued that they are uniquely situated to teach it, use it, and evaluate it. This position is supported by the fact that librarians currently provide assistance and offer training on other research tools, from Google Documents to RefWorks, frequently in interdisciplinary settings (e.g., within a health sciences library that serves multiple research and academic departments). Librarians often use these tools themselves to become knowledgeable in order to answer their users' questions, either through continuing education (Rethlefsen, Piorun, & Prince, 2009) or by self-directed learning (Whisner, 2009). Google Wave could be integrated into workflows in a similar fashion, giving both librarians and information professionals opportunities to demonstrate value as cutting edge information technology adopters and teachers, especially if they are able to help with evaluating when its use might be appropriate.

Librarians who serve the population of clinical and translational science researchers may find all of these roles particularly relevant, given Wave's promise for interdisciplinary collaboration and the subsequent potential for new authorship models. Clinical and translational science researchers span a breadth of disciplines including everything from basic chemistry to family practice to public health in the effort to speed up the process from bench to bedside to practice and back again (Woolf, 2008). Between 2006 and 2010, 55 clinical and translational science centers in the United States received federal funding awards, and there will be a total of 60 of these official programs within the next few years (National Center for Research Resources, 2010). In addition, there are numerous other institutions in the U.S. and around the world doing similar research. The collaboration and authorship models that Wave makes possible seem potentially useful to this user community. However, these models raise

concerns such as tracking large numbers of authors (who may be inter-institutional as well as interdisciplinary), managing copyright and ownership, and deciding how and where to preserve and make accessible work done in the Wave environment. All of these concerns fall into areas where librarians and information professionals have expertise.

The Case for a Case Study

Demonstrating the potential for Google Wave's use in the translational science realm and describing information professionals' possible roles is an interesting thought exercise, but "potential" does not itself necessarily translate into real life adoption. The author's interest in exploring stakeholders' actual use and thoughts on Google Wave coincided with the Evidence-Based Scholarly Communication Conference call for original research on scholarly communication topics, specifically within the clinical and translational science realm. The conference provided an opportunity to collect preliminary evidence and to present it to a librarian and information professional audience directly involved in clinical and translational science support. Given the time limit of the months between the proposal's acceptance and the actual conference, along with the fact that Google Wave was still in a preview or developmental stage, and it had not been widely adopted, the author determined that the case study would be the most practical method for establishing some initial evidence regarding the use of Wave in the clinical and translational science. Without a large number of users who, 1) have had significant experience with Wave and, 2) who are affiliated with a translational science program, a bigger experiment or trial was not feasible. Observational studies are an important part of the evidence base for this very reason (Ahn, Bhandari, & Schemitsch, 2009; Black, 1996; Hoppe, Schemitsch, Morshed, Tornetta, & Bhandari, 2009).

In addition, most likely because of the newness of both Google Wave and the field of clinical and translational science, there did not

appear to be any available evidence on their intersection. There have been a few recently published articles that discuss the potential of Google Wave as a Web-based laboratory record (Neylon, 2009) and as a tool to help pediatricians (Sethi, 2010), but neither of these provided actual evidence on the use of Wave. Another article discussed the concrete development of a Google Wave “SynBioWave” for synthetic biologists, but offered no evaluation of its adoption (Staab, Walossek, Nellessen, Grünberg, Arndt, & Müller, 2010).

Looking for articles on communication solutions for clinical and translational research yielded more results. A study at the University of Pittsburgh described the process of creating and evaluating an “Electronic Management – Clinical Translational Research System” that combined information, communication, and data hubs (Cecchetti et al., 2009). Cecchetti and his colleagues concluded that such systems “are a valuable support to CTR [clinical translational research] that can be provided throughout the CTR community, including the consortia of institutions that hold Clinical Translational Science Awards” (p. 455). All of these studies together lend support to looking deeper into Wave’s potential. However, rather than immediately integrating Wave into clinical and translational science workflows, it may be prudent to follow Koufogiannakis’s (2007) suggestion “to plan an innovative project with research and assessment in mind” (p. 109) and to heed Booth’s (2007) plea that “[o]nly by putting in place mechanisms for capturing evaluative data as we introduce new technologies will we provide others with the opportunity to build upon what we are currently learning” (p. 301). Therefore, this case study, which can also be viewed from the action research and collaborative inquiry perspective (Blichfeldt & Andersen, 2006), provides an early evidence based evaluation of Google Wave’s potential, lays the groundwork for continued evaluation, and may provide a model for the early evaluation of other technologies that could impact the scholarly communication of clinical and translational research.

Population

This study focused on Google Wave users from the United States who are involved with or affiliated in some capacity with clinical and translational science institutions, especially those who have received or are applying for the National Institutes of Health CTSA (collectively identified here as “CTSA-minded institutions”). This population became the primary focus, because it was also the target population for the Evidence-Based Scholarly Communication (EBSC) Conference, where the results were presented. Targeted users included investigators, support staff, and affiliated (liaison) librarians and information professionals of these institutions. Members of the general public were also able to participate in the public survey, although they were not directly recruited.

Individuals from CTSA-minded institutions were asked to self-identify and were invited from public waves on related topics (e.g., research collaboration, scholarly communication, health technology, and biomedical informatics) found by searching Wave tags and text. A blip was added to each appropriate wave, inviting individuals with affiliation to take the survey by clicking on a direct link. Because this recruitment was all done publicly, it became possible for members of the general public to participate. Additionally, “calls” for participants went through other available means, including Twitter, a health informatics forum (Donahue, 2010b), and a guest post on a CTSA-affiliated medical librarian’s blog (Donahue & Dettmar, 2010). Attempts were also made to contact the CTSA Communications Key Function Committee in order to gain access to CTSA-wide electronic mail lists, but were not successful.

Since individuals were recruited using social networking technologies (after attempts to reach the Communication Committee failed), this population was also assumed to already have an interest in using these technologies. In addition, the focus on recruiting within Wave lent itself to attracting users with

familiarity with the tool. While on one hand this practice could bias the study towards those with positive feelings about Wave, it also ensured that respondents were at least somewhat knowledgeable about the tool as they evaluated it.

Methods

This case study explored Google Wave using qualitative survey and discussion tools. Two waves were created to house these tools separately, and both are still available in Google Wave. The decision was made to do the study within Wave, because not only did Wave have the ability to easily capture any data collected, but also because it demanded that everyone who responded have had at least some experience with the tool. This may have been a significant limitation, in that it created the assumption that those reading the waves were literate in their use, but it also created a mechanism to capture data within a test implementation, along the lines of Booth and Koufogiannakis's advice.

The first wave was and is public and consists of several brief survey questions (using a polling gadget created specifically for Wave). It was designed to collect demographic data on the respondents' roles (i.e., researcher, librarian, support staff, or general public), if and what specific gadgets and bots might be useful, and potential collaborators for using Wave. Survey questions used both explicit options and an option to add "other" choices, if desired (Appendix A). The survey format was selected because it could be easily implemented within Wave and because it would be easy to manage and collect data should a large number of people respond.

The second wave was a private, guided discussion on collaboration in Wave. The purpose of this discussion was two-fold: 1) to collect more in-depth feedback as well as quotations on Wave's potential, and 2) to explore that potential by creating a space where respondents could experiment and practice using Wave's features. In fact, in order to take advantage of Wave's

collaboration capabilities, a novel authorship model was proposed for this project: anyone who contributed to the discussion wave would have the option of being considered an author on this paper. In theory, this would create a real world test case for scholarly communication through Wave.

Formal data collection on the two waves began Friday, 8 Jan. 2010 (following confirmation that the proposal was appropriate and accepted for the EBSC conference). Data collection prior to the conference ended on Friday, 19 Feb. 2010. However, the waves are still and will remain open indefinitely, and a few additional responses are reported in the results below that were not reported at the EBSC conference. The last response recorded here is from 28 June 2010. The waves will remain a living place for the indefinite future, to collect future work and discussion in response to this article. The private discussion wave has also been made public. Both of the waves can be accessed through their URLs and then by either signing in with or creating a Google account (Donahue, 2010a; Donahue, 2010c).

Results

As of 28 June 2010, eleven individuals had joined the public survey wave in addition to the author. These individuals did not each answer all the survey questions, but each question had multiple responders. One of the participants explicitly expressed interest in joining the private discussion wave, and all were eventually invited to join for the sake of numbers. However, there was no participation in the discussion wave by the conclusion of the study, and no additional authors for this paper, as hoped for in the authorship model outlined above.

A full tally of the number of responses for each survey question can be found in Appendix B. However, given the low number of respondents, the results are reported here on a case-by-case basis and grouped by the labels with which the respondents self-identified. The individual cases were isolated

using the Google Wave playback features, and only those individuals who answered the initial "Does Wave have potential?" question are described below. (For this particular question, 3 responded "yes," 5 responded "maybe," and 1 responded "no"; total n=9). Anonymity has been preserved in the paper, and no identifying information was requested in the survey, although individuals might have been identifiable by usernames used in the wave.

Librarian Responses

Of the respondents who answered the "Does Wave have potential?" question (4/9) were librarians. The librarians mostly felt that Wave might have potential for CTSA-minded institutions, although one librarian (Librarian 4) did respond with a definitive "yes." (However, this was the only question to which Librarian 4 responded.) Librarians 1 and 2 responded that "Fnoordlinky," a bot that takes a PubMed Identifier (a unique number assigned to each citation in PubMed) and returns the citation directly into the wave, would be of use to researchers. However, they did not suggest any additional gadgets or bots. Librarians 1-3 agreed that there was potential in Wave for collaboration between researchers within institutions and with librarians. Librarians 1 and 2 also thought that there was potential for collaborating with researchers outside of the home institution, but only Librarian 2 felt that Wave would be helpful for coordinating with project managers. The final question on potential uses also showed some variation among the librarian responders. Librarian 1 felt that sharing resources and collaborating on papers both within and between institutions, and asking questions within an institution were all potential uses. Librarian 2 agreed that sharing resources both within and between had potential, and also felt that there was potential for coordinating project teams. Librarian 3 saw potential for collaborating on papers within an institution, and also saw potential in coordinating project teams.

CTSA-Minded Institution Support Staff Responses

Three of the respondents identified themselves as clinical and translational science institute support staff. Staff 1 indicated that Wave was not useful for CTSA-minded researchers, yet they also indicated that there was potential within Wave to collaborate with researchers both inside and outside the home institution, as well as with project managers and librarians. Staff 1 also saw the coordination of project teams as a potential use. So although Staff 1 was the only individual to go with the absolute "no" on Wave's potential usefulness, there was still an indication of some potential, given the responses to the other questions. Staff 2 was the most positive responder, choosing "yes" when asked whether Wave had potential and choosing both Fnoordlinky and "watexy" (a bot that allows for the use of the mathematical LaTeX language within a wave) as useful bots and gadgets. Staff 2 also indicated that all collaboration suggestions and all use options could have potential. However, Staff 2, like all other respondents, did not add any additional suggestions, even though it was possible to do so on every question. Staff 3 also chose "yes" for the question of whether Wave had potential, but did not answer any additional questions.

Unknown and General Public Responses

The final two respondents were a member of the general public, and an individual who chose not to identify with a demographic group. The unknown individual responded only to the potential usefulness question, and indicated that Wave might be of use. The member of the general public also chose "maybe" when asked if Wave had the potential to be useful. This individual also chose watexy as a potentially useful bot. The unknown individual further indicated that Wave could be used to work with any of the given collaborators (i.e., researchers both from the home and outside institutions, project managers, and librarians), and felt that Wave's potential uses included coordinating teams, sharing resources both within and between

institutions, and collaborating on papers both within and between institutions.

Discussion

Some of the study's limitations have already been mentioned, including the recruitment of respondents and the method of placing the study within Wave. In the future, ideally these limitations could be addressed by expanding recruitment (possibly through incentives and additional channels) and by choosing an alternative method of data collection (perhaps after some initial test on the ability to use the tool being evaluated). It might also be helpful for future studies to put the limitations of the low response rate and the short time period (given the timeframe of the EBSC conference) in context and to discuss them in more depth.

One deterring factor against more participation might have been Wave's pre-beta, preview status. Not only was it a new tool, it was also a tool not yet available to everyone. It also lacked some desired functionality. In addition, Wave often ran slowly and frequently crashed. Another important issue was Wave's lack of privacy. For example, it was apparent who responded to the poll questions; every blip has clear authorship, perhaps a reason why some of the respondents chose not to take the complete survey. In addition, Google's terms and conditions indicate that Google has the right to use anything posted in Wave, public or private. This is a major deterrent for researchers and investigators, although this would not be the same issue on an institution-controlled Wave server.

The other side of the privacy issue was a lack of authority control. It would have been possible --although perhaps unlikely, given the amount of effort-- for example, for someone to give false information by impersonating a CTSA-minded individual. Another communication issue became apparent as efforts to reach out to participants continued unsuccessfully: there did not seem to be a standard method for communicating

with CTSA-minded investigators and affiliated staff in order to effectively promote the survey.

Any future studies might benefit from planning for additional time to find appropriate communication channels. The communication channels that were used for this study likely also affected the participant demographics. While it was acknowledged that participants would be Wave users and therefore only a small percentage of CTSA-minded institution staff, the author's reliance on a network of medical librarians (after the CTSA Communications Key Function Committee failed to respond), almost certainly contributed to the larger number of librarian respondents.

The small result set of this study implies that Google Wave is not on the forefront of clinical and translational science communication, despite some initial positive feedback. These results do not provide solid evidence either for or against the tool's potential (although the lack of response and interest certainly seems to indicate a lack of potential, despite the small amount of positive feedback). However, it is clear that Wave was being used and that it has opened up new collaboration and authorship capabilities. Simply being aware of these abilities may be useful to information professionals serving CTSA-minded institutions. Also, while the number of respondents was very small, the results may provide a starting place should a CTSA-minded institution show interest in using tools similar to Wave. For instance, most of the individual cases supported using Wave as a collaboration tool, but there was not much support for using it as more of a communication tool (e.g., asking questions). Building on this early evidence might help focus internal marketing efforts and early evaluations.

In addition, although there was little knowledge gained in terms of whether Wave is perceived as potentially useful for CTSA-minded institutions, and no information whatsoever on the use of Google Wave as a multi-author tool for affiliated investigators

and staff, there are examples in other fields, such as journalism and business, where Wave is used for collaboration (Google, 2010). There is also the takeaway lesson of the overall research process. In this case, the process demonstrated the usefulness of doing preliminary case-study research to evaluate a new technology. The cost in terms of time (designing, creating, and promoting the survey and discussion waves) was relatively low, and knowledge was gained on how to use the technology while establishing a base level of evidence to potentially build on in the future. A single individual did the groundwork for the project over the course of less than three months; a similar undertaking might be a useful strategy (e.g., for a lone liaison librarian) for attempting to gather evidence on the use and potential of a new tool such as an open-access platform or an institutional repository. Keeping in mind the lesson learned on the lack of CTSA-minded institution communication, it may be prudent to first focus on use in a home institution to start, or to first confirm that the selected method of communication with the CTSA-minded institutions will work.

Conclusion

On 4 Aug. 2010, the Official Google Blog announced that development on Google Wave as a standalone product had been canceled, and that the Wave site itself will likely only be supported through the end of the year (Hölzle, 2010). Since that announcement, plans for the completion of a "Wave-In-A-Box" project have finalized around the creation of an application to be hosted and used on individual servers (North, 2010). While Wave is not exactly gone for good, the ways in which CTSA-minded institutions might use it seem dead in the water, or at the very least, different from the inter-institutional communication, collaboration, and authorship ideas this project was exploring.

Perhaps it is fitting, then, that this case study did not provide significant evidence to support the idea that Google Wave is of value to members of the CTSA-minded institution

community. However, that is not to say that it was inconsequential. It raises questions for future research, including exploring the communication needs of CTSA-minded researchers, such as what (if any) information they communicate to each other, given their highly interdisciplinary backgrounds; what communication channels they use; and what features are the most important or missing from these tools.

There may also be future research in understanding why there was so little uptake for this study. In addition to the reasons given in the discussion, there may be issues of communication tool "overload," a lack of technological skills, or a lack of interest. Comparative research studies with groups using different tools would be an appropriate next step as well. These directions all fall within the realm of scholarly communication, where librarians and information professionals have a vested interest. It may be prudent for us to address these research questions, so that we might find places where our skills are needed within the communication flow. To take a step in a different direction, knowledge about communication methods may help with future studies similar to this one, where a new tool may have some potential and evidence is needed on what is already working.

Some of this project's respondents did indicate that Wave may yet be useful, and there were conversations occurring within Wave about its potential usefulness in research and for scholarly communication (eResearch community wave, 2010). The "Wave-In-A-Box" project could produce cases regarding interesting uses. Some of the technologies developed are indeed already being put to use, including "the in-browser rich text editor, the wave model, and the concurrency control mechanism" (Zamfirescu & Baxter, 2010). There may be continuing research for information professionals in understanding how these technologies could affect everything from workflows to personal information management, and comparison studies with already existing technologies

would again be viable. This may be a long way off, but perhaps knowing about tools such as Wave and recognizing that these new technologies will be bringing unique challenges is a lesson itself.

CTSA-minded institutions may never “catch the Wave,” but perhaps the lessons learned from this project can help the librarians and information professionals who serve them prepare for whatever is next on the horizon.

Acknowledgements

The author thanks the medical librarians on Twitter who responded to and forwarded her requests for participants in her Wave survey, with special thanks to Nikki Dettmar, who also hosted a guest post on her blog. Many thanks as well to Jon Eldridge, Philip Kroth, the participants at the EBSC conference, and to my peer reviewers, whose comments and suggestions for improving this paper were immensely helpful.

This research was supported in part by an appointment to the NLM Associate Fellowship Program sponsored by the National Library of Medicine and administered by the Oak Ridge Institute for Science and Education. The University of Minnesota Bio-Medical Library provided additional support as an NLM Associate Fellowship Program second year host.

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Appendix A – “The Potential for Wave at CTSA-Minded Institutions/CTSI” (Survey Questions)

1. *Does Wave have the potential to be helpful to researchers at CTSIs?*
 - a. Yes
 - b. No
 - c. Maybe
2. *Who are you?*
 - a. CTSI Researcher
 - b. Librarian
 - c. CTSI Support Staff
 - d. CTSI-unaffiliated/general public
 - e. (add option)
3. *Gadgets and robots that might have potential for research (vote for all that appeal to you):*
 - a. Fnoordlinky (converts PMID to citation info)
 - b. watexy (use LaTeX mathematical language in waves)
 - c. None or N/A
 - d. (add option)
4. *Who You Would Work With: Potential Wave Collaborators (vote for all that appeal to you):*
 - a. Researchers at home institution
 - b. Researchers at other institutions
 - c. Project managers
 - d. Librarians/Information Professionals
 - e. (add option)
5. *Potential Uses for Wave (vote for all that appeal to you):*
 - a. Sharing resources within institution
 - b. Sharing resources outside of institution
 - c. Coordinating project teams
 - d. Collaboration on papers within an institution
 - e. Collaboration on papers with other institutions
 - f. Asking questions within institution
 - g. Asking questions outside of institution
 - h. (add option)

Appendix B – Survey Results

1. Does Wave have the potential to be helpful to researchers at CTSIs?

Yes	3
No	1
Maybe	5
<i>Total N</i>	9

2. Who are you?

CTSI Researcher	0
Librarian	4
CTSI Support Staff	3
CTSI-unaffiliated/general public	2
(Add additional option)	0
<i>Total N</i>	9

3. Gadgets and robots that might have potential for research (vote for all that appeal to you):

Fnordlinky	3
Watexy	2
None or N/A	0
(Add additional option)	0
<i>Total Votes</i>	5

4. Who you would work with: potential Wave collaborators (vote for all that appeal to you):

Researchers at home institution	6
Researchers at other institution	5
Project managers	5
Librarians/Information Professionals	6
(Add additional option)	0
<i>Total Votes</i>	22

5. Potential uses for Wave (vote for all that appeal to you):

Sharing resources within institution	4
Sharing resources outside of institution	4
Coordinating project teams	5
Collaboration on papers within an institution	4
Collaboration on papers with other institutions	3
Asking questions within institution	2
Asking questions outside of institution	1
(Add additional option)	0
<i>Total Votes</i>	23