

Co-Defining Technology in User-to-User Online Support: the Case of Virtual Reality (VR) Hardware

Francis Raymond Calbay

University of the Philippines Open University
Doctoral Student, Faculty of Information and Communication Studies
Los Baños, Laguna 4031, Philippines.

ABSTRACT

Users of nascent technologies, such as virtual reality (VR), typically have limited sources of information about the product at the onset. Participating in online discussion forums is one way for them to reach out and learn from a likeminded community about the features and workings of new technology. By analyzing the content of discussion forums about a VR product, this qualitative study delves into how users co-define technology in their own words as they proposed workarounds, made sense of form and function, as well as reimagined improvements in the product. The study also proposes that users produce a form of technical communication through user-generated content, as well as identifies practical implications of its integration in technical communication deliverables.

Keywords: user-generated content; virtual reality; technology co-definition; discussion forums; thematic analysis; technical communication

Introduction

Technical communication is a specialized professional practice concerned with synthesizing and packaging information (such as into manuals, software texts, video demos, etc.) to explain the installation, administration, and usage of complex technology to various stakeholders. According to Lannon and Gurak (2014), technical communication serves three primary purposes: to anticipate and answer questions, to guide users into performing a task, and to persuade thinking about complex matters. In practice and in scholarship around the subfield, technical communication is generally seen as a skills-based, corporate-driven, and utilitarian-oriented mode of communication. Its given objective is to convey innovation and explain technology following a linear transmission model: from an official source, through gatekeepers and proper channels, and down to end-users.

Effective technical communication is particularly important especially when introducing nascent technologies, such as virtual reality (VR). Pope (2018) notes that although the concept of VR has been discussed in literature and media since half-a-century ago, "it has just recently become available to the more general public through a variety of devices for home use that have been released onto the market" (p.5). One of such examples is the market-leading Vive VR system, a partnership between the digital gaming

platform Steam and the hardware manufacturer HTC. In its latest iteration, VR now has the capability of 360-degree motion detection, enabling users to experience content in a more immersive (both visually and aurally) and interactive manner. However, the requirements for setting up a VR system in most consumer contexts are not a straightforward process – making it prone to user error, frustration, and complaints that may not be readily resolved by corporate-produced technical communication.

As a response to the limitations of available information, users have been observed to discuss their product experiences with one another in online channels. Per Nambisan and Baron (2007), this is particularly true in "technology-based product contexts...that are characterized by rich and complex set of features" (p.46). To this end, this study looks at "unofficial" technical communication – that is, sources and products of technical communication that surface outside of standard corporate practices. The study analyzes how users co-define nascent technology (specifically, virtual technology) in their own words via user-generated content posted online in product support-oriented forums. It argues that this type of content could enrich existing technical communication and could also be considered as a form of technical communication. The objective is not

to describe how technology users aid or support each other per se in using or troubleshooting products, but to draw insights from their participation in bottom-up knowledge/value creation about the technology.

User-generated content and/as technical communication

Any creative effort published online outside of professional contexts by ordinary people are considered to be user-generated content (OECD, 2007: 8). The broad umbrella term includes blogs, social media posts, user-to-user replies, podcasts, videos, and other digital hybrids. As an object of study, user-generated content may be collected from blogs, forums, or even in the comment sections of websites owned by traditional media outlets or by private companies. It can be said that user-generated content is the by-product of the participatory culture espoused by the Internet. But despite their ubiquity, the legitimacy of user-generated content is still questioned by professional content producers, including technical communication practitioners. In Dubinsky's (2015) survey among managers of technical communicators, majority indicated that user-generated content is not important in their company's documentation cycle. User-generated content is categorized by Carliner (2012) as an activity that contributed to the contra-professionalization of technical communicators, thereby diminishing their market value. Moreover, user-generated content is perceived to threaten the profession, as Cleary (2011) found out "analyzing potential threats such as that from user-generated content" (p.47) as one of the latent themes from blogs by technical communication practitioners.

Continuing the careerist perspective in technical communication research about user-generated content, Frith (2014) suggested that technical communicators are uniquely suited to assume the role of community managers of their company's online help-related forums. However, his study equated the practice of forum moderation as technical communication and didn't claim that user-generated content itself is a type of technical communication. Pflugfelder (2016) steered the focus on "content" by studying some 233 threads in Reddit's "Explain Like I'm Five" section, where he referred to the contributed posts as

technical descriptions. From his analysis of the Reddit threads, he observed linguistic simplification (relating complicated concepts in plain language) and explanatory simplification (distilling large amount of information into a more comprehensible account).

Unlike the layperson contributors in popular social forums like Reddit, Jeppesen and Frederiksen (2006) implied that crowdsourcing communities, in their investigation of forum exchanges about a computer-controlled music instrument, are usually the domains of hobbyists and expert users whose primary motivation is the recognition by the community or the firm. On the question of participation in online communities, Rivera and Cox (2016) used the practice-based approach in observing the implementation of a university-based human resources project through collaborative technology. They noted that "participation was a collective endeavor shaped by shared ways of doing things and knowings" (p.29) - a good takeoff point in estimating knowledge generation among users themselves.

From reviewing related studies, it has been apparent that research on user-generated content from the purview of technical communication is still marginal and emerging. Particularly lacking is the emphasis on content itself as the object of study, since past studies tend to prioritize professional or practitioner concerns surrounding the issue of user-generated content. This leads to an opportunity to demonstrate how users "technically communicate" with one another as they unpack new technology. The study hopes to bridge this gap as it argues how early adopters, in the process of discussing or troubleshooting a product issue, co-define the technology in the context of user-to-user support in online discussion forums.

Study frameworks

Common Ground Theory and Activity Theory are some lenses through which user-generated content in the subfield of technical communication can be made sense of. These theories deepen understanding of the knowledge-sharing and exchange that happen when end-users interact in online discussion forums and thereby produce technical communication. Both theories are aligned with

how interpretivism is “premised on a dialogic, social constructionist view of the world” (Mumby, 1997: 8), and are well-suited with the qualitative research paradigm that reality is multiple and subjective. As Anderson (2010) says of qualitative research, “there is no final answer, only an increasing density of narrative” (p.42).

Common Ground Theory regards communication as “generally premised on the sharing of a language, of a vast amount of practical background knowledge about how things work in the physical and social world, of many social practices implicit in interaction and of an orientation within a shared context” (Stahl, 2006: 346). In computer-mediated communication, community formation is also attributed to the notion of common ground, although mutual understanding is more challenging to attain asynchronously than in face-to-face communication due to the lack of verbal cues (Monk, 2003). Nevertheless, affiliation is formed in online discussion forums among customers of a product, especially those that are considered early adopters. In working with each other to figure out and attempt to resolve issues they grapple with nascent technology, users in an online discussion forum are presumed to arrive at a mutual understanding from the prism of Common Ground Theory.

On the other hand, Activity Theory considers artifacts such as documents to be “created and transformed during the development of the activity itself and carry with them a particular culture” (Kuutti, 1993: 26). The theory can be applied “where a subject, who is motivated toward the solution of a problem or purpose (object), is mediated by tools in collaboration with others (community)” (Van der Merwe & de Villiers, 2012: p.203), as in the case of an online discussion forum where users try to troubleshoot a hardware issue in dialog with other enthusiasts. When employed in the creation and consumption of technical communication products, Activity Theory “captures interaction in motion, and because of this, there is no isolation of subject and object” (Technical Communication Body of Knowledge, n.d.).

Method

The Steam community forums (steamcommunity.com), specifically its

discussions about VR products, served as the empirical setting. Since the first generation of the Vive VR system became available to the consumer market in April 2016, it has yet to attain mainstream use, so those who are using the product may be considered as early adopters. There were 273 active topics (where the original post or the reply has been made in the last six months) in VR-related forums as of November 2018. Posts (the individual unit of analysis) in active forums, purposively selected where users attempted at putting into words their understanding of the new technology (or referred to as “technology co-definition in this study), were collected and analyzed.

Following Convery and Cox (2012), informed consent in this online-based study has not been sought because the study was designed to be unobtrusive. To remain consistent with this principle, the posts must be made public for data to be collected. Also, any personally identifiable information from the posts were removed to protect personal interests, while the specific names of forum threads were also paraphrased.

Based on the parameters of the study, co-definitions by users of nascent technology can be gleaned from the questions, pain points, complaints, as well as replies that they share in user-to-user support in online discussion forums. According to Zhang and Wildemuth (2009), the task of qualitative research is to “identify important themes or categories within a body of content and to provide a rich description of the social reality created by those themes/categories” (p. 318). To this end, thematic analysis was executed on the collected data. After patterns and resulting themes were recorded through qualitative textual analysis, the themes were closely read according to the objectives of the study.

By richly characterizing posts and replies in user-to-user support in online discussion forums as manifest content, user-generated co-definitions of technology were surfaced from the data. Anderson and Baym (2004) claim that knowledge from qualitative research is “contingent upon communicative contexts and therefore local and unavoidably multiple” (p.602). Such data from users are a good fit for research in communication in general, which is said to have “moved from a distanced

objectivity to the business of fixing things” (Anderson and Baym, 2004: 607).

Findings: Texts and Themes

In this study, through indications of technology co-definitions, user-to-user supports in online discussion forums were argued to be technical communication and a form of knowledge construction. Findings from the research were constructed from insights based on purposively selected user generated content. The following sections identify and elaborate on the themes gleaned from the data, as well as present supporting textual evidence from the discussions.

1.1 Meaning-making from proposed workarounds

This theme aggregated troubleshooting information posted online by users that provided actionable information on how to resolve issues, errors, and pain points. Meaning was derived from experiencing and encountering the technology, and then communicated as an attempt at defining the technology. This capacity is notable since, per Anderson and Baym (2004), “even the simple act of writing a sentence that claims to describe ‘what is’ (such as this one) is a claim to epistemic authority” (p.606).

In the course of such user-to-user support, some posts described what the hardware is or does in the context of perceived problems about its use. For instance, where the original poster in the thread criticized the complicated setup requirements, another user replied that it only took 15 minutes per experience while at the same time highlighted the nature of the VR product:

“The [VR product] is a full room-scale experience out of the box.”

From trial and error, users were able to express their own understanding of the workings of new technology. In a thread about the controllers not working properly, a user posted the his/her comprehension of the base stations (which are sensors that track the movement of the headset and controllers), by using the unofficial and pre-product launch term “lighthouses”. The user also described how the hardware typically behave in a normal manner (status light is green), as well as identified a possible cause of error.

“Lighthouses are pretty passive. They either work blasting out IR beams or they don’t. If they’re both green, they’re good (unless something reflective is interfering with tracking).”

In a discussion on how to interact in VR without controllers, the original poster asked for possible ways without using the controller to select options when the overlay unintentionally shows. A user posted the following instruction, which also provides an orientation of the hardware parts and its uses. Identifying parts and designating functions are common tasks in technical communication.

“There is a button on the left side of the headset (by the LED) that you can press to open and close the overlay, so you can use that to exit by just pressing it once... it’s like the button on the controllers.”

1.2 Making sense of form and function

This theme pertains to the displayed familiarity by users in the forums about the capabilities and limitations of the VR hardware. By exhibiting intermediate knowledge, users can explicitly put into words their version of how to operate the technology, including their subjective views and opinions. In a thread asking if the base stations could properly work upside down, the following reply was posted on how base stations can be used, which showed confidence in its veracity despite contrary information (installation should be front-facing) coming from the manufacturer:

“It does work, and all orientation axis are processed by the headset itself rather than the lighthouse units.”

Users debated in another thread whether a virtual keyboard and a mouse would be useful when playing VR content. This type of interaction concurs with the observation that users come from different backgrounds and are challenged by “heterophily”, or the competence-based difference between two or more individuals who communicate in a technology transfer situation (Rogers, 2002: 331). The discussions and the quality of knowledge being exchanged by users in the forums could also be treated as indicators of their basic expectations, whether met or

unmet, of the technology. From the replies, the following surfaced as a conceptualization of how VR hardware should be differentiated from older technology (such as a keyboard) :

“VR headsets (and games by design) offer 6 degrees of freedom and movement in space for the player who is wearing the headset, and 6 degrees of freedom for each of the controllers held. Mouse and keyboard can’t even replicate 6DoF for one controller.”

In a question on how to disable the standby mode on the headset, the original poster sought advice on switching the headset from standby to normal mode. A user pointed to a fix via the hardware settings, while another user countered with possible causes for such a problem and suggested a workaround that deviated from the standard procedures. Such type of prescriptive posts can also be said to yield an approximation of the hardware by its users. Below is an example:

“Either you have a bad sensor, or some light leakage inside the headset... a quick test is to put a small piece of tape (like an electrical tape) or a small piece of a sticky pad over the sensor inside the headset, just above the lenses in the middle.”

1.3 *Textual reimagining of technology*

With lower expectations on technical stability and limited information about how new technology could function, early adopters are at a unique situation to frame the innovation from their own perspectives. With the affordances of forums in digital media, this theme describes how users are able to articulate the possibilities of how innovation can still advance and adapt to actual needs. For example, a user provided a detailed description of how the controller can be improved:

“The circle would be off the exterior of the touchpad (not touching the touchpad), flush with the controller (hence the curve in the bottom fitting into the concave of the controller) and the top of the ring a bit lower than the spring but higher than the base of the puck. It would prevent movements on the pad. The controller grips around

the left and right of the ring for extra stability. The circle could theoretically be perfectly flat right around the touchpad, but it might be more stable if it fits into the crevices around the touchpad.”

A thread alerting users about a probable design flaw where sweat was said to potentially damage the headset already opined how a pain point should be resolved to fix the product for the better. Here, liquid damage from accumulated sweat from using the VR headset has been identified to be a potential glitch that is not covered by product warranty. Another example of such an insight in improving the product is in a reply posted regarding a question on how to turn off the headset completely, which observed that there was no obvious indicator whether the VR system is turned on or off. Although the suggestion for an on/off button may come across as rather simple, such a button did not exist in the original VR hardware:

“In hindsight, there should have been a power on/off button on the link box.”

Observed difficulties and complaints such as contained in the posts can directly feed into any company’s technical communication process, since “the benefit of being able to hear customers’ views, rapidly respond to their comments and concerns, and gain insight into how the company is being discussed is sharply reduced” (Crawford, 2016: 531). Any information that talks about known issues and pain points around new technology, especially coming from actual users themselves, can be harnessed as feedback not just to communication about the product but to the product itself.

As suggested by this theme, users identified improvements in the design of the VR hardware and raised issue about perceived product flaws. This is consistent with other observations that user-generated content is replete with intentions of “suggesting improvements, modifying or hacking products, problem-solving for and supporting other users, and experimenting with product platforms” (Weber, Weggeman, and Van Aken, 2012: 1250018-10). The practice of co-defining could potentially lead to co-designing and co-creating the technology itself.

Through user-to-user support in the forums, the levels of technology co-definitions range from the objective (for example, generic descriptions) to the subjective (such as accounts of overcoming setup limitations), with some creative suggestions as well for potential improvements of the product. As described in the identified themes, users co-defined technology based on their experiences, as prompted by problems and limitations they encountered as well as clarified issues through their interactions in the forums. By interacting in the online discussion forums, technology users were seen to create technical descriptions and procedural content that could be considered as a form of technical communication.

Concluding discussion and practical implications

In analyzing the collected data on user-to-user support in online discussion forums, users of the VR hardware may be said to produce co-definitions of the technology. As they proposed and shared workarounds with each other, it became apparent how they derived meaning, expressed understanding, and labelled parts of the new technology.

In making sense of the hardware in both form and function, they communicated their own impression, differentiation, and approximation of the hardware's parts, features, and capabilities. They also reimagined the product by suggesting changes from pain points and by identifying possibilities for future improvement.

From their interaction in the online discussion forums, technology users were seen to create content with shared meaning (a hallmark of Common Ground Theory) and purpose orientation (a condition of Activity Theory). The co-definitions produced in relation to the hardware point to shared meaning, especially in the exchange and acknowledgement of the utility of such information among the VR enthusiasts. On the other hand, the practical and pragmatic nature of the information being exchanged, taken under the premise of solving issues confronted by the community in the use of the hardware, highlight the aspect of purpose-orientation.

By treating user-generated content as technical communication, users (who are traditionally

seen as passive recipients of information) should be recognized as active participants in co-defining and shaping what the technology is or could be. This study could hopefully contribute to filling the gap in a predominantly transmissions-oriented research in the technical communication profession by pointing out how users play an active role in understanding and giving meaning to technology – among themselves, and as feedback to corporate processes. By addressing this issue, authorship and textual production that count as technical communication will be seen as not an exclusive domain of professionals and companies that seek to control messages but may also come from individuals who may not have a business agenda at all.

User-to-user support also indicated that some information known among the users were not covered nor endorsed by official technical communication resources. A practical implication to technical communication is the benefit of developing systems and platforms (such as hosted communities) to leverage user-generated content. By understanding how user-generated content in online channels construct/contribute to knowledge about the technology, a contribution to practical knowledge is that those in charge of managing technical communication could also factor in the information as potential topics to be adapted and published on the company's official website, software-integrated texts, and other types of product documentation.

Though its conclusion may not be generalizable across cases (since users of a consumer VR product may have different expectations compared to, for example, administrators of medical technology), the study has associated user-generated content as a type of technical communication and of knowledge generation provided the right situation and motivation. Future studies can further investigate the interplay between professional and amateur content production, which may be done via content audits of existing technical communication resources vis-a-vis user-generated content or an evaluation of how forums integrated with how-to or help pages increase user satisfaction.

References

- Anderson, J. (2010). "Thinking Qualitatively: Hermeneutics in Science". In *An Integrated Approach to Communication Theory and Research*, 2nd Edition, pp. 40-58. New York: Routledge.
- Anderson, J. & Baym, G. (2004). "Philosophies and Philosophic Issues in Communication", *Journal of Communication*, 589-615.
- Carliner, S. (2012). "The Three Approaches to Professionalization in Technical Communication", *Technical Communication*, 59 (1) : 49-65.
- Cleary, Y. (2011). "Discussions About the Technical Communication Profession: Perspectives from the Blogosphere", *Technical Communication*, 58 (4) : 31-51.
- Convery, I. & Cox, D. (2012). "A Review of Research Ethics in Internet-Based Research", *Practitioner Research in Higher Education*, 6 (1), 50-57.
- Crawford, K. (2009). "Following You: Disciplines of Listening in Social Media". *Continuum*, 23 (4), 525-535.
- Dubinsky, J. (2015). "Products and Processes: Transition from 'Product Documentation' to 'Integrated Technical Content'", *Technical Communication*, 62 (2) : 118-134.
- Frith, J. (2014). "Forum Moderation as Technical Communication: The Social Web and Employment Opportunities for Technical Communicators", *Technical Communication*, 61 (3) : 173-184.
- Jeppesen, L. & Frederiksen, L. (2006). "Why Do Users Contribute to Firm-Hosted User Communities? The Case of Computer-Controlled Music Instruments", *Organization Science*, 17 (1), 45-63.
- Lannon, J. & Gurak, L. (2014). *Technical Communication*, 13th Edition. Boston: Pearson.
- Mumby, D. (1997). "Modernism, Postmodernism, and Communication Studies: A Rereading of an Ongoing Debate", *Communication Theory*, 7 (1) : 1-28.
- Nambisan, S. and Baron, R. (2007). "Interactions in Virtual Customer Environments: Implications for Product Support and Customer Relationship Management", *Journal of Interactive Marketing*, 21 (2) : 42-62.
- Organisation for Economic Co-operation and Development (OECD). (2007). *Participative Web: User-Created Content*. Paris: OECD.
- Pflugfelder, E. (2016). "Reddit's 'Explain Like I'm Five': Technical Descriptions in the Wild", *Technical Communication Quarterly*, 26 (1) : 25-41.
- Pope, H. (2018). "Introduction to Virtual and Augmented Reality", *Library Technology Reports*, 54 (6), 5-7.
- Rivera, G. and Cox, A. (2016). "A Practice-Based Approach to Understanding Participation in Online Communities", *Journal of Computer-Mediated Communication*, 21: 17-32.
- Rogers, E. (2002). "The Nature of Technology Transfer", *Science Communication*, 23 (3) : 323-341.
- Stahl, G. (2006). *Group Cognition: Computer Support for Building Collaborative Knowledge*. Cambridge: MIT Press.
- Technical Communication Body of Knowledge (n.d.). Activity Theory. Retrieved 24 February 2018 from <http://www.tcbok.org/wiki/research/applied-theory/activity-theory-2/>
- Weber, M., Weggeman, M., & Van Aken, J. (2012). "Developing What Customers Really Need: Involving Customers in Innovations", *International Journal of Innovation and Technology Management*, 9 (3) : 1250018-1250033.
- Van der Merwe, T. and de Villiers, M. (2012). Collaboration in Online Discussion Forums: An Activity Theory-Driven Model for Managing Socio-Cultural Influences, Illustrated by a Case Study, *Progressio*, 34 (3) : 200-216.
- Zhang Y and Wildemuth B (2009) Qualitative Analysis of Content. In: Wildemuth B (ed.) *Applications of Social Research Methods to Questions in Information and Library Science*, pp. 308-319. Westport, CT: Libraries Unlimited.
