

Crowdsourced Q&A-based Contextual Help for Web Applications: Challenges and Opportunities

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INTRODUCTION

Millions of users struggle every day in using and configuring software applications to meet their needs. Although many approaches for software help have been developed over the last three decades, most users do not find them helpful [5,11]. As the web becomes increasingly social, *crowdsourced* forms of software help (e.g., [7,10,12]) have also been emerging. For example, users can post questions and answers (Q&A) on technical forums, mailing lists, or within their online social networks. Although these crowdsourced forms of help potentially save organizations millions of dollars in one-on-one support costs, users often have a difficult time in navigating through these Q&A discussions and finding the information that they actually need during the use of an application.

To improve access to crowdsourced forms of help, recent approaches have offered Q&A help features within the application's interface. For example, *TurboTax* help [13] and *IP-QAT* [9] display help discussions in a sidebar within the application, retrieving all the Q&A relevant to the specific page that a user is currently viewing. The *LemonAid* help system [4] lets users retrieve Q&A at an even finer granularity by selecting a label, widget, link, image or other user interface (UI) element. Although these *crowdsourced contextual help* approaches improve the retrieval of relevant Q&A based on application context, they raise many questions about community participation and user engagement in contextual Q&A conversations.

In this paper, we briefly discuss the community participation aspects of crowdsourced contextual help. In particular, we focus on the design of *LemonAid* [4] and our multi-site "in the wild" field study of this help system [3]. We discuss several challenges and opportunities for social Q&A that emerged from this study and highlight characteristics that may be unique to the domain of software help (and contextual help in particular). We also discuss the role of domain experts (such as software support

staff) in moderating social Q&A conversations and maintaining the relevance and utility of the crowdsourced content for end users.

DESIGN AND EVALUATION OF A CROWDSOURCED Q&A-BASED CONTEXTUAL HELP SYSTEM

LemonAid is an example of a crowdsourced Q&A-based contextual help system. The key idea behind *LemonAid* [4] is that users enter a semi-transparent help mode overlaid onto the application's user interface and then retrieve help by selecting a label or image they believe is relevant to their problem. *LemonAid* retrieves and displays existing Q&A related to a user's selection within the interface (retrieval algorithm and interface described in detail in [3]). To enable a social Q&A system within the application and evaluate it "in the wild," we had to make several design considerations at the system level and at the organizational level during our field study.

Designing for Community Participation

Participation in *LemonAid* is designed to be open in that either end users or support staff can contribute questions and/or answers. Users can browse through or search the existing set of questions to find what they are looking for before they submit their own questions. Users can also be notified of new answers via email without having to return to the site. *LemonAid* also allows users to report potential spam and offer "me too" votes on questions. *LemonAid* includes a basic moderation feature that allows support staff and moderators to receive e-mail notifications of new questions and answers so that they can both approve content, answer new questions, or improve users' answers. Other users can also provide answers to existing questions or can add additional comments or clarifications.

To ensure that there is some default help content upon first use, each host software team can seed the help database with FAQs or other help content relevant to each page.

Studying Users' Perceptions in the Field

To understand users' perceptions of crowdsourced contextual help, we deployed [3] *LemonAid* on four sites reaching user populations of 150 to over 40,000 users at a large US university. The four deployment sites included the university's library system, a departmental site, a clinical data capture application, and a personnel and grant management site. The deployment periods ranged from 7 to 15 weeks and

we collected over 1,200 logs, 168 exit surveys, and 36 interviews with end-users. Our mixed-method study and analysis showed that LemonAid was helpful, intuitive, and desirable for reuse for over 70% of users across all the deployment sites and that users found LemonAid to be a refreshing approach compared to other modern forms of help. (See [3] for a description of the field study and more detailed findings).

CHALLENGES AND OPPORTUNITIES

Users' Perceptions of the Social Aspects of Help

Overall, we found that users appreciated the social aspects of retrieving help through LemonAid. For example, as users browsed through other users' questions and saw other votes on questions, it was a validating experience for them to know that they were not alone in experiencing particular issues. Users also felt that the serendipitous discovery of new information about the application or tips through the contextual Q&A was also useful when they were not looking for any particular answers. The help content in LemonAid was also noted as being valuable because the Q&A came from other people using the application and not "jargon" from a predefined help document (a limitation of other forms of contextual help approaches).

Community Participation in the Larger Context

While end users were overall positive about LemonAid, we found that most of the Q&A content came from the software teams rather than other users. For example, the logs of our largest deployment with a library site showed that only 16 new questions were added during the deployment, constituting about 1.6% of the total help sessions (972) over 15 weeks. We also found that no end users answered a question; library staff answered all new questions. (We did find that the 16 new questions asked by users received 121 views, accounting for about 21.5% of all question views and 74.3% of the corresponding answers were marked as helpful.)

Although it seems that few users contributed questions and answers in our deployments, prior work has shown that this level of activity is typical of what occurs in technical forums [6,7,9]. Similar low end user participation has also been observed in other community-based systems, such as *AnswerGarden* [1]. Also, this level of participation is characteristic of communities that exist more broadly on the Internet (e.g., "the 1% rule" [2]) where most users are consumers of online content rather than contributors. Still, our interviews revealed that users were even more cautious about posting content in LemonAid because the Q&A overlaid on the application's interface seemed "more official" (versus a separate forum or social networking site). This challenge is perhaps unique to crowdsourced contextual help systems given that the Q&A are accessed from within the application.

In future work, it would be interesting to compare the level of participation that we saw in the current set of deployments to: 1) sites that have perhaps millions of active users; and 2) sites that use a closed familiar social network to crowdsource

Q&A. We are curious to tease out whether there are differences in a small community-based Q&A forum (e.g., our deployment sites that had a few hundred or thousands of users) vs. a larger crowdsourced Q&A forum (e.g., sites such as *YouTube* that draw millions of daily users) vs. a closed social-network Q&A forum (i.e., sites that connect to only Facebook or Twitter friends). Our hunch is that we would see some differences in the level of activity, but in any of these cases, there would still be need to incentivize users to participate on a regular basis. We could, for example, consider incentives such as badges, awards and leaderboards that help make forums such as *Stack Overflow* successful [8].

The Role of Software Teams in Moderating Q&A

Despite the seemingly low end user participation in the Q&A, the promising finding in the study of LemonAid was that users still derived benefit from using this crowdsourced contextual help approach. We believe that users could still find the content valuable because the host software teams were actively involved in maintaining the Q&A. For example, the host teams were able to devote time and resources to seed the initial database with existing FAQs, monitor the questions as they were entered, and provide answers. It may be that to sustain the same level of quality in answers, a long-term commitment from the host teams would be necessary. Since many modern organizations have already opted to create peer-to-peer support forums, perhaps engaging with users through crowdsourced contextual help is a natural extension. Also, users noted that when a staff member provided an answer, they were more likely to trust the authority and quality of that answer.

Unlike other forms of social Q&A, we feel that moderation by software teams can be integral to crowdsourced contextual help rather than seen as an extra feature. For example, the team members who participated in our study felt that investing in one-to-many support is more efficient and provides greater cost-savings in the long run compared to supporting users one-on-one. So, if team members can be alerted of new questions posted by users and teams can provide timely answers, it can be mutually beneficial for teams and a large number of users. Also, since LemonAid appeared to be "a part of" the application, maintaining the quality and accuracy of the help content was more critical for the host teams and team members appreciated having the additional control over the Q&A.

In summary, we have described the concept of crowdsourced Q&A-based contextual help for software and discussed the design of LemonAid. We have also discussed some results from a large field study that we carried out to understand users' perceptions of LemonAid in the wild and the challenges and opportunities that arise from our findings. We look forward to having discussions with other researchers and practitioners at the Social Media Question Asking workshop and learning about ways to tackle some of these challenges and the opportunities that they bring.

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