Website Maintenance: Managing and Implementing User Requests

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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ABSTRACT
Dominion Energy, an energy and power company centered in Virginia, found that its Human Resources department needed a more functional employee-information site to allow for efficient operation. I gathered feedback from HR employees and edited the site to allow for filtering of company employees and other search options. The HR department communicated its interests via email and I adjusted the site using HTML, SQL, and ASP.NET. While the HR department at Dominion Energy was able to more efficiently access employee data with the edited site, this informal method of requesting and implementing changes to the website was not ideal, suggesting two additional changes were needed: 1) a more deliberate system enabling Dominion Energy and other companies to collect and apply employee feedback to company sites in an organized manner; and 2) more collaboration between the user and the developer in order to promote improved communication. Future work is also needed to develop protocols for formally suggesting site changes and to foster better technical communication skills between technical and non-technical employees.

1. INTRODUCTION

"The most important single aspect of software development is to be clear about what you are trying to build." — Stroustrup, designer of the C++ programming language. Anyone who has undertaken a long-term project, technical or otherwise, can relate to this message and understand the importance of grasping the goal of a project or assignment before getting started. How can we create something if we are not sure what we are being asked to make? This is even more critical when discussing the creation of any kind of software, where maintenance and future changes can comprise 90% of the total software cost, according to Dehaghani and Hajrahhimi (2013) [5].

I was brought on to Dominion Energy's intern program in order to handle requests related to user feedback. I was tasked with changing the company's HR employee website to allow HR personnel to more efficiently find and sort employee information. However, it became clear that Dominion Energy did not have an official user request system and I communicated with employees via email. While this was fine for interacting with one or two employees, it is not a suitable system for long term use.

There was also a lack of clarity inherent in this method of communication. Non-technical employees made requests that were significantly difficult or did not make logical sense based on the site setup. This made it difficult to obtain a clear understanding of what I was working to accomplish and what would satisfy the user.

2. RELATED WORKS

Johanssen, et al. (2019) describe methods of collecting user feedback in a company environment in order to apply feedback towards the improvement of software. This serves as a useful reference to develop a similar system of user feedback collection and analysis within Dominion Energy.

Saiedian and Dale (2000) discuss the communication gap between developers and end users. They focus on the requirement elicitation process and ways to mitigate ambiguity and uncertainty when dealing with user communication. It is useful to consider the suggestions in this article when developing communication channels between users and developers within Dominion Energy so that requested changes to the HR website can be communicated effectively and completed to the satisfaction of the user.

3. PROPOSED DESIGN

In this section, I will discuss the three major issues that I observed with Dominion Energy's current user feedback system. Next, I will reference published research in order to suggest changes to the user feedback system in order to solve each of the observed issues.

3.1 Observed Problems

The first observed issue with the current setup of Dominion Energy's employee request system is that it is not clearly outlined. It did not have an official channel or method for getting in touch with the developers in order to request a change to the website. Instead, users would be required to hunt through the company's list of IT and software development teams and send out emails asking for the requested change. This process is time-consuming and tedious for everyone involved, therefore it would be useful to create an official, clearly outlined method of communication between software developers and users.

Sending an email in order to request a desired change is also not ideal. I saw that communicating about technical systems over email was very difficult. Users were often vague in describing the problem. For example, an HR employee wanting to search through a list of the company's employees filtered 'by date' could mean the date they joined the company, the date they assumed their most recent role in the company, or even the date when they last completed HR training. Ambiguities such as this paired with the slow back-and-forth of email communication made it a lengthy, difficult process for understanding the needs of the user.

Finally, users were generally uneducated about the system and were not sure what information was stored in the employee database. This made it difficult for them to formulate ideas for changes to the website or communicate those changes concisely.

3.2 Suggested Changes

A study conducted in 2019 by Johanssen, et. al. examined user feedback collection processes at 17 different companies [4]. It is useful to consider how other companies approach the issue of gathering user feedback so that similar methods can be applied to Dominion Energy. For the specific type of user feedback I worked with, I would suggest collecting explicit user feedback in continuous intervals while also implementing a request submission system. The periodic collection of user feedback will ensure that users are satisfied with the current system, allow users easy access to developers in order to point out problems, and prompt users to be more involved in system development.

One of the company developers interviewed in this study revealed that "…the ongoing and active exchange between developers and users emerges as successful in practice," thereby justifying the development of periodic, open communication channels between users and developers. The request submission system is also a useful addition to the user feedback process, as it will allow users to quickly submit a request to the correct group of developers.

A paper written in 2013 by Pagano and Bruegge [2] perfectly sums up the issue of relying on email communication: "…user feedback written in natural language… requires developers to get into the user's mind to be able to reproduce her issue or request." Parsing written user requests is difficult and subjective, which is why I would suggest that the periodic collection of user feedback involve face-to-face discussion of the system.

The timing of these developer-user meetings may vary based on need, but Dominion Energy could begin with four meetings per year where developers interview a sample of users in order to determine the user-level satisfaction of the system. By switching to face-to-face meetings, users can be asked to elaborate on problems, point out problems specifically by referencing the website, and allow developers to gain a better sense of what additions or changes to the website would be beneficial. This method of sampling users and collecting feedback would also give developers a better sense of overall opinion on the website, including positives, that would not be evident through a request submission system.

The request submission system itself should be easily accessible and may be located on the company's IT resources page. Through this system, users will be able to submit a brief description of the problem and may wait to hear back from developers to schedule a meeting to discuss the issue further.

Again, I believe face-to-face communication would be the best method of communication between developers and users. The number of requests I received during my internship was small enough that this system would be possible. I am making the assumption that the number of user change requests specifically for the HR employee website would be manageable and that it would be reasonable to meet with all users who submitted a request.

Finally, lack of user understanding of the system is also a barrier to communication between developers and users. As Saiedian and Dale (2000) [3] explain, often users "…do not know what it is they can ask for in a new or updated product development." They suggest that the developer take a more active role in gathering user feedback by informing users about possible changes to the website as well as possible roadblocks or challenges.

It is the developer's responsibility to inform users about the software and how it relates to them. As developers, we can also use techniques such as asking clarifying questions, gathering feedback from multiple users, and paying attention to the consistency of users explaining their requested changes [3]. These suggestions are useful to implement during face-to-face meetings between developers and users where clear communication is key.

4. ANTICIPATED OUTCOMES

Implementing a periodic user feedback system will allow developers to better understand user-perception of the website. From this, developers may make pre-

emptive changes to the site based on recurring user feedback, thus leading to greater user satisfaction and fewer change requests. The request submission system will be useful for users to officially request changes to the site, increasing user-satisfaction. These two methods of user-developer communication will lead to the improvement of Dominion Energy's HR website, thus enabling HR employees to complete their jobs more efficiently.

Using face-to-face meetings and taking time to inform users about how the system operates will also contribute to this goal. Overall, the proposed design will allow for a less tedious, difficult-to-use change request system for users and will promote a more deliberate process for improving the HR employee website.

5. CONCLUSION

It is well understood in the software development world that user feedback is an important metric for understanding user satisfaction with a final product. User feedback is also effective for gauging user needs in order to minimize expensive changes to the software later on. This motivates developers to collect clear, accurate feedback from users in order to make appropriate adjustments to the software. This project emphasizes the idea of designing user feedback systems to promote user-developer communication in order to ensure user satisfaction with the final product. It highlights some of the important aspects to consider when developing an effective user feedback system.

6. FUTURE WORK

Future work would involve implementing this user feedback system at Dominion Energy and collecting data about company operations in order to gauge the effect of the new system. The goal of future work would be to measure user satisfaction under an effective user feedback system and contrast it with user satisfaction under a prior, ineffective user feedback system. It would also be worthwhile to understand how implementing a new user feedback system would impact holistic company operations related to the software.

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