SWord: A Concept Application for Mitigating Internet Terminology Anxiety

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Abstract. The Internet is a dynamic, democratic, and multicultural platform where a wide range of users access sites daily. We cannot presume users on the Internet will understand every single word/term used on any given site. This paper presents a concept for assessing users' anxiety regarding commonly used words on the Internet, particularly words related to technology and computer science. The concept is highlighted by an application, called SWord, which enables users to collaborate, share, play, and mitigate with difficult words on the web.

Keywords: Wellness, human anxiety, Anxiety, Internet, Design, user experience.

1 Introduction

"The pen is mightier than the sword"
-Edward Bulwer-Lytton (Richelieu; Or the Conspiracy, 1839)

As pointed out by English author, Edward Bulwer-Lytton, the power of freedom, opinion, and thoughts is stronger than the power of violence through weapons. This insight suggests words can solve problems more imaginatively than force; i.e., the sword. In the present context, the web, or the Internet, acts as the pen where the ideas and opinions of the public are read, collected, shared, and discussed. But, sometimes the words used on the web can be difficult to understand. For example, while reading an article on a specific site(s), the user might find terms or words difficult to comprehend. Consequently, a novice user on the web might, for instance, either "look up" a difficult word(s) or simply ignore it. What if we place the word power in the hands of the users? The users gain in full control to define, share, and play with the words they find difficult to understand.

SWord is a social mobile application, a word game that will help users online [15] to both define and conceptualize difficult terms in a game-like manner using social networking features. Any founded or defined terms are read, recommended or further commented so that the term might become understandable and thus, measuring and reducing Internet Terminology Anxiety (ITA) [1, 2]. The major contribution in this paper is the conceptualization, design and development of the SWord utility for

M. Kurosu (Ed.): Human-Computer Interaction, Part II, HCII 2013, LNCS 8005, pp. 239–248, 2013.

possible mitigation of ITA. The approach is based use-case, empathy (capability to think, feel, and sense users' emotional needs) [19] and design research. Additionally, the play and learn brainstorming process [9, 10] is used when designing this utility. Thus, the main research question we seek to explore is: *Can the 'Sword 'utility mitigate Internet terminology anxiety (ITA)?*

Our paper is structured as follows. The next section provides the related work of Internet terminology anxiety. Section 3 introduces SWord utility and its elements. Section 4 illustrates the mitigation of ITA. Section 5 describes an end-user evaluation, and Section 6 and 7 discusses on findings and conclusions.

2 Related Work

Internet anxiety (IA) is a recent phenomenon, and not widely studied or explored. Some researchers are, however, actively working to understand this phenomenon [1, 4-5]. Presno defined IA as "a more specific form of computer anxiety" [1]. Thatcher et al. studied and conceptualized Internet anxiety as relating to computer anxiety [5]. Joiner et al. studied gender variables and their impact on Internet experience and behavior [2]. Internet anxiety occurs mainly when dealing with various issues and problems related to general Internet use (e.g. difficulties in understanding terms, Internet connection failure). Many researchers argue that people suffer from the Internet as they would suffer from any real disease [4, 8, 20]. These studies have reported that users on the Internet show signs of frustration, anger, depression and loneliness [21, 22]. A user who has problems with words/terms on the web is considered to possess, "Internet terminology anxiety" (ITA) [1, 6, 8]. This paper presents a study in which a tool/utility for users who have issues understanding words/terms on the web is conceptualized and designed.

2.1 Internet Terminology Anxiety

Accurate use of terminology is clearly central to effective communication but management of terminology often poses challenges for businesses and software developers [15]. Internet terminology is terms used as words or word combinations that provide meaning for specific concepts on the Internet [1, 8]. ITA is defined as "an anxiety caused by Internet terminologies" [9]. More specifically, Internet Terminology Anxiety (ITA) is "feelings of anxiety as they were introduced to a host of new vocabulary words and acronyms. For example, HTML (Hypertext Markup Language), and SLIP (Serial Line Internet Protocol) etc [1, p. 153]." There are several benefits from managing terminology. Namely, it enables users to engage and share knowledge, and learn new vocabulary/words; it reduces technical documentation or translation costs for managing software; it facilitates agreement on cross-cultural differences for terms in the software development life-cycle; and it ensures consistency and coherent use of terms throughout software development processes [15, 17].

3 SWord Utility

The approach of the SWord utility is partly similar to the game *Balderdash,* where the concept is to self-invent definitions of the words and by convincing peers to get points based on deception. The SWord utility is different in that the concept is NOT to self-invent definitions but utilize knowledge and insights to define difficult words that might, eventually, help anxious users and other end-users, thus mitigating their Internet Terminology Anxiety.

As the goals of interaction design [9, 13] (Ixd) are to make the application, system and product more useful for users, the SWord utility (or application) uses exploratory interaction design styles to build the utility. Using this method, various game elements are explored and introduced to users. The utility can enable users to engage in social activities by actively participating and learning. The "terms" used on the web can be interpreted differently by Internet users from different countries and cultures. The design [10] presented can enable users to define the terms (irrespective of their country and culture); collect user defined terms; display user defined meaning for anxiety-inducing terms, share terms (e.g. on Facebook, Twitter and others), play with terms, and get rewarded (e.g. by winning badges or scoring points) for the collected terms. The benefit of SWord can be seen from the conceptual aspects. The conceptual diagram of SWord is shown in Figure 1, where it can be seen that Sword can be used as a plug-in or as a gaming interface utilizing *FeelCalc* [7], i.e. with a set of algorithms.

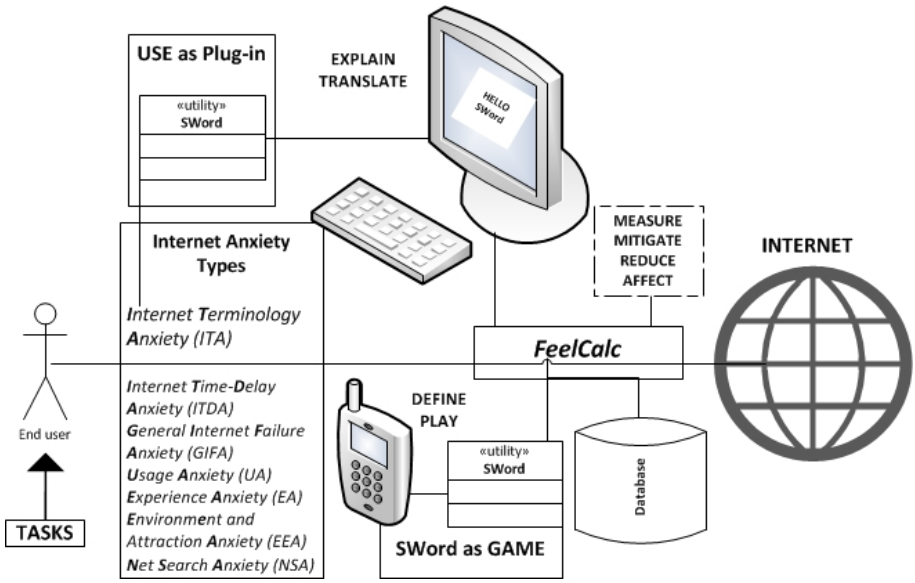

Fig. 1. SWord conceptual diagram

3.1 User Motivation

The goal of the study is to increase users' contributions to 'SWord' and design a reward system to motivate users. To motivate users, the following hypotheses were posited: *would it be fine to visit sites without feeling anxious as the words are becoming less cryptic? And would you like to learn the terms without feeling anxiety*? For example, a reward system is given to the user with reward coupon (e.g. an archetypal user named Matti Mainio has 'word knight' status). In addition, users can challenge friends, build leagues of their own with friends, etc. using social networking capabilities.

3.2 Social Aspect

SWord helps users define difficult terms in a gaming-like manner (utilizing social media functionality). The end-user reads these definitions for terms they do not understand. The social aspect of 'SWord' can run on 'word-of-mouth' and welcoming users with a 'newcomer of the day' concept design could encourage newcomers. The gaming aspect will provide learning opportunities for users, thereby encouraging social participation. The social participation of the game can be based on peer scores for correctly defined word(s). For example, a user can define as many words as he wants but the correct answer is only with one peer. A score is calculated based on numerical values of 1-5. The peer with a highest score wins the game, gaining various badges and points, and a peer with a lower score loses the game. Using a likability empathetic design feature, a user will be motivated to define words. Because of the likability feature of defined words/terms, more users will be willing to participate in defining difficult words/terms.

3.3 User Profile

A user is presented with a single user profile page. A user in-gaming profile is created for gamers. The score of other users is shown in the scroll bar in the middle pane. The game can be integrated under the user profile. The user profile picture and the recently defined words are designed in SWord. Likewise, a user's profile (i.e. 'about me') page is created where a user can have his profile picture, "recently viewed words", and "recently defined words" under the list.

3.4 Defining Word/Term(s)

Target users are those who are have difficulty understanding terms on the Internet and those who are anxious and suffering from ITA symptoms. These users will simply define the given set of words based on their preexisting knowledge and experiences. Whenever a user feels anxious about a specific word (s)he can highlight the word by double clicking and then (s)he right-clicks on the term to "collect," "compete," and "share".

3.5 Gaming Aspect

The in-gaming aspects of 'SWord' are shown in Figure 2. The work of Blashki and Nichole highlights the importance of welcoming newcomers to a game. In their article [16], terminology used among gamers is used, for example, "leet speak or 1337 5p34k," which divides users between expert gamers and newcomers. In SWord, their advice is adopted with the design of a "newcomers of the day" feature. The upper part in Figure 2 shows basic statistics about the user's social virality (e.g. LIKES, number of defined words). A user is given five terms at a time, and his task is to define those terms by typing-in the definitions. The rectangle (on the right side of the screen) shows the user has defined the term and the other empty rectangle shows the term being currently defined. There are two buttons at the end of the interface: "That's Enough" and "Give Me More!" The game can be stopped by clicking on 'That's Enough,' or there is a possibility to get five more terms to play with by pressing 'Give Me More'.

Rules for Playing the Game

Figure 2 illustrates the in-gaming aspect of 'SWord'.

1. The upper part (1, 2, and 3) shows basic statistics about the user's social activity (e.g. what does the user like, number of defined words).
2. A user is given five terms (4) at a time, and his task is to define those terms by typing-in the definitions (5). Upon challenge by an opponent, an automated word cloud (7), and dictionary usage for determining authentic definition for terms can be acquired.
3. The rectangles show the user has successfully defined the term and the white bubble shows the term being defined (5).
4. The rectangles (6) show terms that have not yet been defined. There are only two buttons at the bottom of the interface: "That's Enough" (9) and "Give Me More!" (8)
5. The game can be stopped by clicking on 'That's Enough' or another five terms elicited by pressing 'Give Me More'.

4 Mitigating Internet Terminology Anxiety

Many wellness applications exist that increase users' participation in physical activity [11, 12]. This design utility is built with the objective of mitigating ITA symptoms shown by users on the Internet, focusing and combining interdisciplinary concepts; e.g., medical, psychological, and HCI aspects. In the development stage, a user usage scenario was considered where the SWord utility is used by 1) the user who defines the terms (end user), and by 2) the anxious user. In the SWord utility, an end-user defines the word(s) and the anxious user competes in the in-game interface by defining difficult words from a word cloud.

Fig. 2. SWord in-game screenshot

The result of 'SWord' utility can be used by increasing users' motivation to contribute. Users will be more likely to feel committed if they share some form of attachment or bonding (e.g., here most users are feeling anxious about terms/words on sites). To mitigate ITA, the following steps are employed:

1. A user visits any site and starts reading its contents. In Figure 3, the user has visited the ACM home page (i.e. www.acm.org).
2. The SWord prototype is running in the background. This is shown in Figure 3 at the bottom right corner with a SWord utility logo 'S'.
3. The user highlights the word/term and clicks. Figure 3 shows the chosen word/term, i.e., "computing."
4. The user can start defining the difficult word(s). As task were designed with level of difficulty, this task was assumed "*extremely difficult*" since users might possess cognitive load and lack motivation for defining terms. Figure 3 shows the SWord utility panel that enables the user to click for defining words.
5. A user can either collect, compete, share, and play with difficult word(s).

Fig. 3. Screenshot of a user reading an ACM home entry as (s)he comes across a difficult word (e.g. "Computing")

5 End User Evaluation

User evaluation is considered an important aspect of developing the SWord utility. A small number of participants (n=7) volunteered to test the effectiveness of the design concept of SWord. Each of the evaluators was provided with the sets of tasks. Following questions related with the tasks, the evaluators reported on the results for the tasks. As the aim of the SWord utility was to mitigate user anxiety for difficult words/terms on the Internet. SWord utility was installed in the *Mozilla Firefox browser* as an add-on/plug-in. The following task was given to the evalutors:

1. Read content on Internet sites, e.g., the ACM home page
2. Whenever you find a difficult word(s)
3. Click on the difficult word(s)
4. A 'SWord' menu should appear
5. Click on "Define word(s)", see Figure 3
6. Click "collect, compete, and share" buttons as appropriate (*Collect* is used to collect user defined difficult terms, *compete* UI will show the gaming interface and *share* UI will allow you to share the word in social networking sites)
7. If you press compete, you will be asked to input your own definitions for difficult words, you may quit the 'SWord' utility by pressing, "That's Enough".

The result of the evaluation gave fruitful insight towards the main research question. In general, there was consensus among participants that the 'SWord' utility can be useful in helping anxious users with a difficult word. Participants reported that the 'SWord' had capability in reducing ITA. More interestingly, participants reported that

the utility can be useful for less technically adept users on the Internet. They defined several hundred words. However, some participants felt uncertain about providing definitions for the terms since they did not understand them. This was supposedly an expected design result because the design concept was to challenge participants' self-reported definitions based on their knowledge and experiences. As an end-user might lack motivation to define terms, SWord intermittently suggests defining words.

6 Discussion and Limitations

As developers and software designers tend to ignore the challenges of recognizing words, the 'SWord' utility attempts to address difficult words/terms for a particular site or websites. In addition, one has to consider Internet terminology anxiety and the possible symptoms that might result from user experience. Therefore, difficult terms or technical jargon should not be on the Internet/web. Researchers have concluded that terminology management and effective communication of terminologies are important in the information technology sector [15, 17]. This matter should be addressed by good design practice [9, 10] in the design of contents and sites on the Internet, and by taking into account the knowledge level of targeted end users.

The anxiety symptoms associated with Internet terminology anxiety (ITA) on the Internet are not the result of user action or inaction but result from poor design. This statement is supported by Don Norman's book, "*The Design of Everyday Things*" [18, p. 131] where he states, *"Change the attitude toward errors. Think of an object's user as attempting to do a task, getting there by imperfect approximations. Don't think of the user as making errors; think of the actions as approximations of what is desired."* End-users and anxious users are both Internet users and they are not to blame for experiencing Internet terminology anxiety or the symptoms associated with anxiety. In addition, the playful nature of SWord utility might assist an anxious user to learn a difficult word and simultaneously compete/play with new users. The game is not designed as a way to help users to memorize the defined terms because some users might then feel anxious about typing the definitions.

7 Conclusion and Future Work

This concept paper presented initial designs for helping anxious users online. We believe users will be very motivated to play the game with peers and define specific terms. Interestingly, users can play in any device e.g., tablet, phone, PC, because SWord is designed in a multi-device platform. This design approach allows the SWord utility to be used both online and offline, enabling users to be less dependent on Internet access. The design concepts presented in this paper can mitigate ITA symptoms by connecting anxious users with other users in relation to their health problems, activities and goals. Furthermore, a user might gain knowledge and insights about the word(s) on the Internet. The take-home message is that the SWord' utility increases users' know-how, learnability (about Internet terms), understanding and

ability to have positive Internet user experience by defining difficult words/terms that result in pleasurable experiences. Future work could comprise the following:

- This paper focuses on Internet terminology and possible mitigation of Internet terminology anxiety via the SWord utility, which is implicitly linked to wellness technologies Other similar application and utilities for different types of Internet anxiety could be designed and created.
- Functional improvements and implementations in the SWord utility could be carried out. However, added functionality does not always lead to better accessibility.
- The user evaluation could be carried out with a larger and more diverse group of participants.

Acknowledgments. This work has been partially supported by ECSE (East Finland Graduate School in Computer Science and Engineering), the Foundation of Nokia Corporation, LUT Foundation grant (Lauri ja Lahja Hotisen rahasto, Väitöskirjan viimeistelyapurahat), and the Finnish Foundation for Technology Promotion (Tekniikan edistämissäätiö). I would like to thank: Tommi Kähkönen, Erno Vanhala and Harri Karhu for active participation in the "Social Computing" course lectured by Dr. Rosta Farzan at ECSE Summer School, Joensuu where we initially worked on this concept.

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