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A user study on regulating upset emotion in workplace through HELMO

Qi Xu

Department of Industrial Engineering, Tsinghua University, Beijing, 100084, China

maggiexuqi@163.com

Abstract. The rising prevalence of emotional distress resulting from mental health pressures constitutes a paramount issue within the context of a rapidly evolving work environment. The detrimental consequences experienced by those affected by this phenomenon are of considerable magnitude. In order to address these issues, it is possible to design relevant applications that can assist individuals in identifying workplace disputes and devising effective strategies to alleviate emotional strain. Previous research has predominantly focused on investigating the potential of robots to exert a positive influence on conflict dynamics within a team-based problem-solving context through their ability to address interpersonal violations post-conflict. Consequently, there is a limited understanding regarding the specific criteria via which robots may contribute to conflict resolution. This study encompasses user research, analysis of essential elements, and the proposal of a high-fidelity prototype named "HELMO". This prototype provides a range of daily functions that can assist individuals in recognizing conflicts and mitigating the danger of experiencing negative emotions. The findings indicate that individuals have a high demand for detecting conflicts and releasing emotional pressure in many subject matters. The mental health application known as HELMO shows promise in addressing the difficulties associated with emotional discomfort that may arise during or following workplace confrontations.

Keywords: mental health, upset emotion, high-fidelity prototype, human-computer interaction.

1. Introduction

The rapid advancements observed in contemporary society have resulted in a notable rise in instances of emotional discomfort within the workplace, primarily attributable to the mounting mental health pressures experienced by individuals. Within these particular contexts, individuals frequently experience symptoms of despair and anxiety.

The integration of technologies into team communications within firms, namely through internal messaging systems, has a significant influence on the social and emotional dynamics of these teams. Furthermore, there exists compelling data suggesting that the emotional behavior exhibited by robots can play a significant role in augmenting the overall efficacy of a team [1]. Jung et al. conducted a study wherein a team consisting of one human participant and two robots was observed. The researchers found that the robots were able to enhance important factors for team effectiveness, such as stress and cognitive load, by making modest adjustments to their gaze behavior [2]. Also, studies were conducted to close gaps between human resource supply and demand by creating a social robot able to mitigate stress, anxiety, and pain [3]. The robot's usefulness and appropriate behavior plays an important role states by

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Thi-Hai-Ha Dang in the role of motivational robotic assistance in reducing user's task stress [4]. These studies collectively indicate that necessity and the inclusion of robots in teams can impact the team's overall effectiveness through their actions, even if these behaviors are not explicitly directed towards task assistance [1]. Developing such understanding is essential for the field of computer-supported collaborative work since almost all work involves groups or teams to some degree, the performance of which is highly dependent on group dynamics [5].

Although there is a substantial body of existing research that supports the notion that robots can improve team dynamics and effectiveness through the regulation of emotions within a team, there is a notable gap in the literature about the practicality of employing mobile applications for this specific goal. This study encompasses user research, comprehensive analysis of key factors, and the proposal of a prototype named "HELMO" by the author. The emotion regulation measures advocated by HELMO have the potential to mitigate individuals' emotional suffering and, thus, enhance work effectiveness in an indirect manner.

2. Pilot Study

The author conducted a pilot study to discover the necessary functions on an application that may be required by individuals experiencing emotional distress.

2.1. Method

The author recruited five employees, aged 25 to 45, from different companies to participate in the user research. The demographic information is summarized in Table 1. Three participants were male, and two participants were female. They were all experienced with mobile technology, spending an average of seven hours daily on their mobile devices. Two of them have previous experience in releasing their workplace mental pressure with mobile applications, while three of them have never used that but feel the pressure. Overall, participants constituted a representative sample of workplace employees potentially dealing with depression.

The author conducted five individual interviews with the participant through the Tencent online meeting platform; each session lasted for 90 minutes. The author recorded the interviews after consent, transcribed the interviews, and qualitatively analyzed the data through a bottom-up approach.

Table 1. Demographic Profile of Participants

ID	Gender	Time spent on the mobile phone per day	Prior experience with stress-relief functions on mobile apps
P1	M	10h	Yes
P2	F	12h	No
P3	M	10h	No
P4	F	9h	Yes
P5	M	9h	No

2.2. Findings

Through the user interview, this paper finds that individuals often experience emotional distress after workplace conflicts. They would try to use some methods to release these emotions; otherwise, it will lead to long-term depression. One participant, referred to as P1, used a health application as a means of emotional release following their workday, engaging in activities such as meditation and physical activity. Nevertheless, he continued to experience persistent mental distress, which ultimately developed into a state of depression. In brief, the findings indicate that 80% of the participants (P1, P2, P4, P5) reported experiencing normal levels of upset emotions in the workplace. Furthermore, it was observed that 80% of these upset emotions were attributed to interactions with company stakeholders or clients. An effective tool is required to assist individuals in efficiently regulating their emotions when experiencing distress. All participants express a perceived necessity for a computerized tool to regulate their emotions, with the expectation that such a tool would provide desired outcomes. However, the

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existing application market in China has a deficiency in providing individuals with specialized tools to effectively address and reduce mental health concerns. Individuals have the option to select a physical health application, such as Huawei Health, to improve their physical well-being. Alternatively, they may utilize the WeChat Moments and status functionalities to document their present emotional state. These approaches may offer transient alleviation, although they fail to tackle the root causes or conduct a comprehensive analysis to mitigate mental health risks or adequately control emotional distress.

3. Prototype Design

Based on the findings and summary of user research, the author developed several functions to prototype the application.

3.1. Ideation

Based on the user research, the author created five empathy maps, one personas to analyze factors that could aid in resolving mental health issues like emotional distress. The three primary modules of the prototype design encompass interpersonal relationship management, risk detection, and corrective action recommendations. These variables are key components of the design framework.

The author has created a profile of one individual who represents the specific user group that this application is targeting. This persona suggests that the age range of the population is between 25 and 45 years old and possesses a strong proficiency in technology. Generally, individuals belonging to this cohort are employed in major corporations and exhibit a substantial number of years of practical expertise. Despite possessing expertise in their respective domains, individuals often experience considerable levels of stress in their professional environments. Although individuals possess the ability to effectively handle disputes, they may nevertheless encounter emotions such as distress, wrath, and other adverse affective states throughout their professional endeavors. Individuals possess a social network that encompasses various connections, such as colleagues, friends, family members, and even offspring. The individuals' principal concerns revolve around the potential effects of their emotions on their overall well-being and the necessity of allocating time to effectively address and regulate negative emotions. Concerns arise over professional conflicts, namely the potential pressure on relationships with coworkers from diverse cultural backgrounds due to the presence of unpleasant emotions. Additionally, they encounter difficulties in preserving emotional equilibrium. This cohort exhibits a proclivity for autonomy, a willingness to embrace emerging technologies, and a propensity for social interaction. The precise design of the prototype was influenced by specific personality qualities, with a particular emphasis on relationship abilities that are indicative of interpersonal status.

In order to conduct a more comprehensive analysis of the manner in which these individuals encounter adverse emotions over the course of a day, the author devised a user journey grounded in the empirical data obtained from the research. The depicted trajectory, as illustrated in Figure 1, encompasses a range of user activities, verbatim statements, emotional dispositions, and potential avenues for engagement.

Typically, this user group’s day involves going to work in the morning, having a cup of coffee or breakfast, interacting with stakeholders or clients, receiving feedback, working with a team or alone, and then returning home. Generally, they feel good when starting their workday, during coffee breaks, while interacting with stakeholders or clients, and during teamwork. However, negative feelings often arise upon receiving feedback from stakeholders or clients. This insight shaped the design concept to focus on evaluating messages with stakeholders or clients for potential risks. In the opportunity section, the author considers what could improve these moments and whether they could be bypassed or addressed elsewhere. Analyzing pre-communication details, such as today's schedule and the characteristics of colleagues and leaders, can be beneficial in the morning. It's advantageous to recommend energizing music to set a positive tone for the workday, and to provide pre-emptive tips about potential scenarios based on database analysis. Identifying emotional words and phrases, offering advice on handling them (e.g., “just ignore”, “never mind”, “take some exercise after work”, etc.), evaluating relationships with colleagues in one's social network, and proposing a corrective action plan,

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such as playing relaxing music based on the day's mood or arranging physical training support, are all crucial aspects of the prototype.

Figure 1. User Journey (original)

3.2. Inform Design for HELMO/ Design process

The analysis resulted in the conceptualization of the prototype, with a particular emphasis on the development of distinct functionalities. In order to provide guidance for the design process, the author developed a series of "point of view" statements and "how might we" queries. The inclusion of point of view statements emphasizes the importance of career-oriented professionals efficiently managing conflicts with clients and stakeholders. This is crucial in order to evaluate their social network and develop a comprehensive corrective action plan. Another aspect that was discussed is the issue of language difficulties encountered by certain experts in the workplace, which might result in unpredictable consequences. The main objective specified was to evaluate situational hazards with clients and develop customized corrective action plans for people.

The "how might we" questions aimed to explore possibilities such as: How might we assist individuals in distinguishing between meaningful and meaningless emotional responses from stakeholders? How might we aid individuals in evaluating their social networks and devising appropriate corrective actions? How might we support individuals in managing the causes of their emotional distress? From these inquiries, the author summarized three key points for the application's functionality: identification, evaluation, and regulation, all aimed at mitigating the mental health issues of these individuals.

In addition, the design of the application prototype was founded upon three fundamental principles: the attainment of simplicity and user-friendliness, the cultivation of an enduring user engagement, and the stimulation of behavioral modifications among users. The author firstly designed the sketches with crazy 8s method. Then the author designed the grayscale using Figma (Figure 2). The author initially employed the "crazy 8s" method to generate a range of sketch ideas. Following this, the author utilized Figma to create the grayscale designs of the application (Figure 2).

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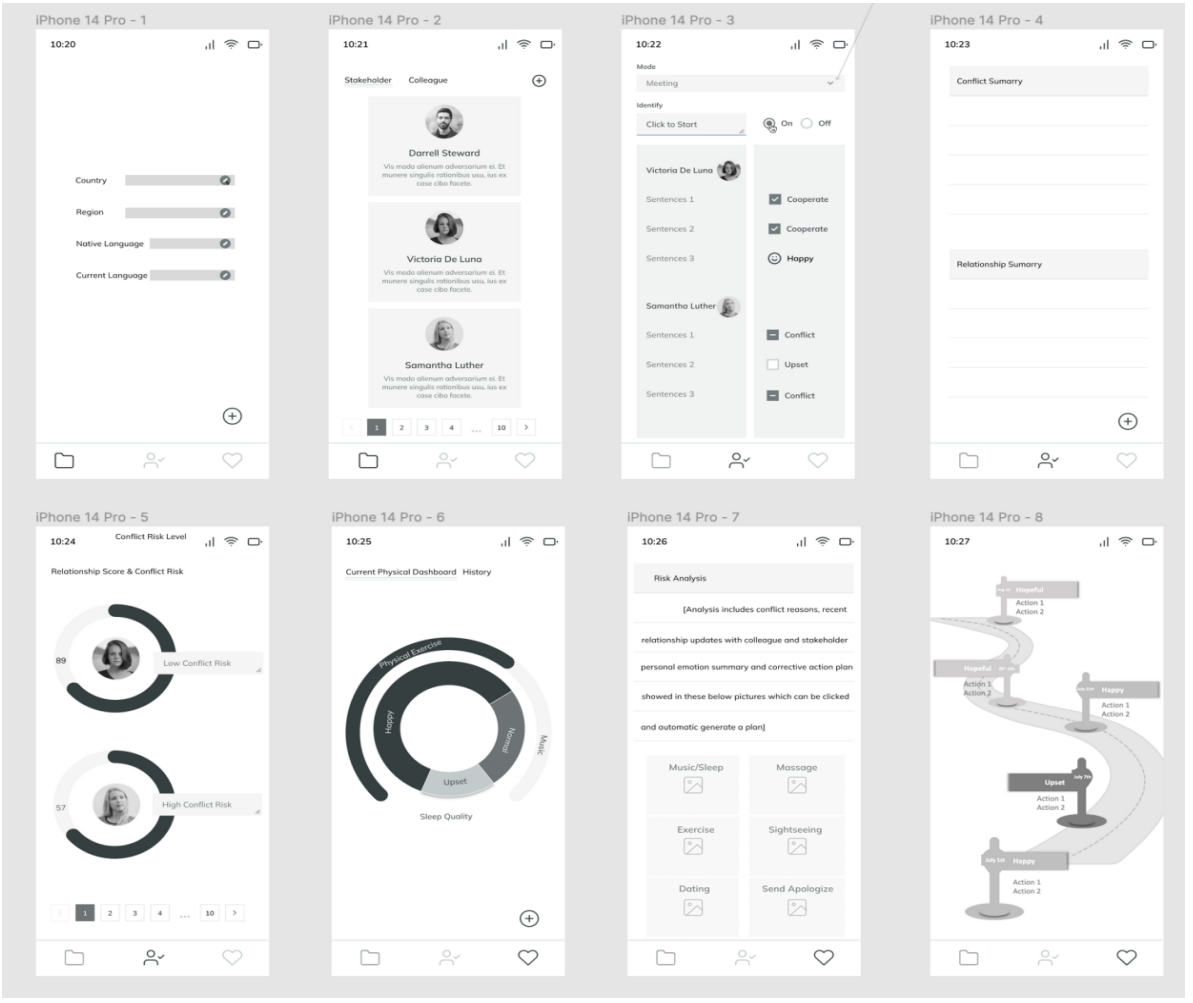

Figure 2. Grayscale (original)

The primary characteristics of the prototype consist of three separate functionalities, which are allocated throughout a collective of eight pages. The initial two pages encompass the first function, referred to as "Interpersonal Documentation." In this context, individuals provide crucial data such their nation of origin, specific region, original language, and currently spoken languages. The availability of this fundamental data allows the HELMO algorithm to provide solutions that are tailored to individual needs. Furthermore, users have the ability to include and investigate data pertaining to stakeholders and clients on the subsequent page.

The second function, referred to as "Relationship Management," commences on page three and spans pages four and five. Users have the ability to document their engagements with stakeholders and clients, whether they occur in formal meetings or informal conversations, on the third page. The app's crucial component not only records conversation data but also autonomously identifies any conflicts or possible dangers with stakeholders and clients, providing real-time status updates. The following pages employ the aforementioned data to generate summaries of conflicts and relationships, ultimately resulting in a relationship rating between the user and their stakeholders or clients, as presented on page five.

The third function, titled "Health Care," which commences on page six, constitutes an additional fundamental component of the application. This part provides an overview of the user's existing physical dashboard. The algorithm proposes potential solutions, such as engaging in physical activity or listening to relaxation music, based on the identification of hazards and emotional states, such as heightened tension during interactions with clients. Further information may be found on page seven of the

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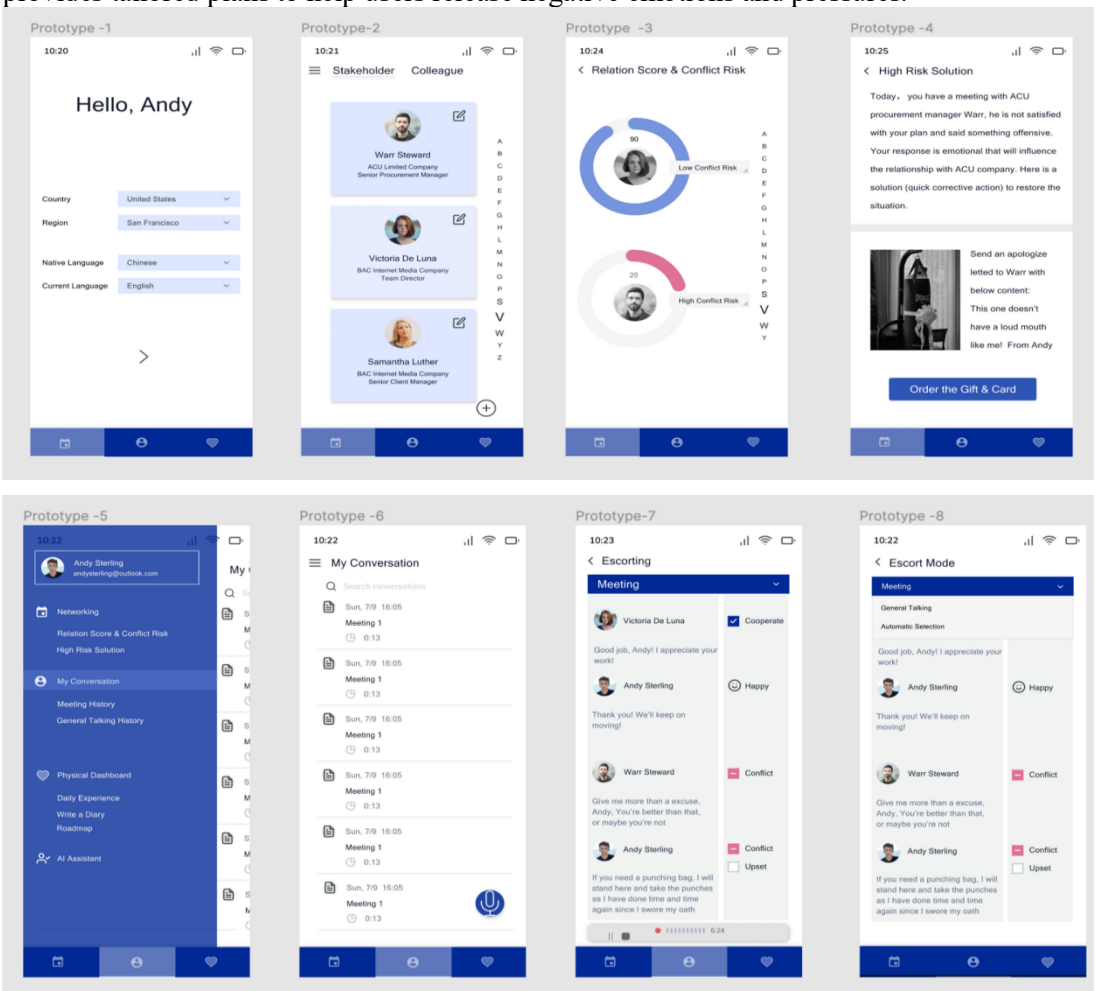
document. The concluding segment of this function, as presented on page eight, presents a visual representation of the user's emotional patterns across various time intervals, including weekly, monthly, or yearly durations. This feature aims to provide a full summary of the user's historical emotional well-being. Participants would report lower stress and higher positive affect after their interaction with the application and perceived supportiveness [6].

Building upon the grayscale foundations, the high-fidelity prototype showcased in Figure 3 incorporates more intricate elements such as layout adjustments, font, color, specific functionalities, and a dashboard on the left side for easier navigation. The HELMO app also integrates additional features like networking, “My Conversation,” a physical dashboard, and an AI assistant. It includes relationship scores and conflict risk assessments, with high-risk solutions automatically generated by the algorithm based on recorded data. “My Conversation” captures the history of meetings and general discussions, categorizing messages by different scenarios. This forms the basis for the algorithm's evaluations of relationship status, individual emotions, relation scores, and conflict risks. It's also instrumental in generating corrective action plans to alleviate negative emotions or pressures. The physical dashboard displays daily experiences and the emotional roadmap, offering a space for users to log daily emotions. Daily emotions records is a kind of Ecological Momentary Assessment data from individuals to report on current or recent psychological states, behaviors, and environmental conditions [7]. The algorithm then provides tailored plans to help users release negative emotions and pressures.



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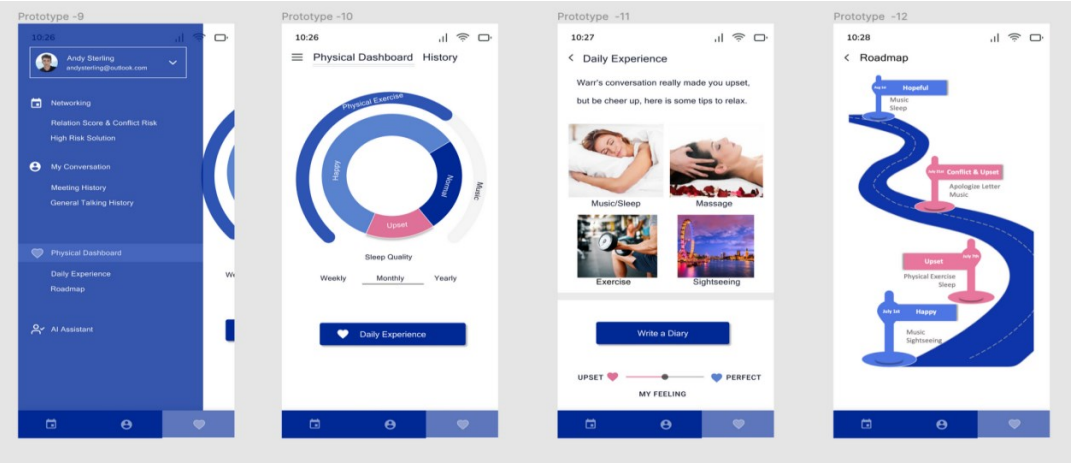

Figure 3. High-fidelity Prototype

4. Results and Future Work

Qualitative methods were essential in the analysis of the study's results. The author, adopting a bottom-up approach, conducted a thorough qualitative analysis. Usability testing was performed with six individuals using the Usability Hub interaction platform, complemented by a series of questionnaires. These tests provided valuable insights and reflections.

In the questionnaire, the researcher examined various crucial facets pertaining to the efficacy of the application. The results revealed that a significant majority, comprising 83% of participants, expressed the belief that the functionalities of the program efficiently facilitated the release of unpleasant feelings. Approximately 71% of participants successfully accomplished all processes and tasks within the application. A significant proportion of the participants demonstrated a propensity to utilize the application on a regular basis. It is worth noting that all participants expressed a unanimous perception that the application was uncomplicated and user-friendly. Approximately half of the participants demonstrated a positive response towards the ideas generated by the artificial intelligence system on the daily experience page. Users emphasized the user-friendly nature of the diary feature, specifically praising its straightforwardness and minimalist aesthetic. Nevertheless, one participant expressed misunderstanding in relation to the pictures illustrating conflict risk, indicating a requirement for more explicit explanations or improved design.

These findings have prompted the identification of many areas that require enhancement. The author intends to modify the accessibility of specific buttons in prototypes 4, 7, and 8, as well as implement design features or functionality in order to enhance user engagement.

Despite the valuable insights provided by the study, it is important to acknowledge its inherent limits. The feedback and opinions of the participants may have been influenced by their high level of education, perhaps leading to a bias, particularly in relation to strategies for effectively regulating unpleasant emotions. The author was prompted to contemplate a more streamlined strategy due to the criticism surrounding the complexity of the application's design. The feedback received indicated the need to streamline the scoring and evaluation elements, and possibly consolidate certain aspects, in order to improve the overall usability and user experience.

5. Conclusion

In this research, the author conducted interviews with a total of six individuals in order to evaluate the usability of the mental health application known as "HELMO." The primary objective of the study was to examine the efficacy of the program in mitigating negative feelings. The findings indicated that consumers exhibited a favorable response towards their inclination to interact with "HELMO," and they acknowledged the efficacy of its diverse functionalities in facilitating emotional alleviation. The research emphasized the potential of HELMO in mitigating workplace stress and provided useful

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insights into individual perceptions regarding the efficacy of this technology solution. The author expresses a strong belief in the potential benefits of these findings for application developers who are striving to produce novel and enhanced tools specifically tailored to aid persons in the management and expression of negative emotions.

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