

The Internet Design Framework for Improvement of Users' Positive Emotions

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*Received March 21, 2022; revised April 6, 2022; accepted April 29, 2022;
published August 31, 2022*

Abstract

This study proposes an internet design framework for users to improve their positive emotions when they are in a negative mood. First, the literature review focuses on the definition of emotion, positive emotional design in internet experiences, and emotion regulation. Second, in order to construct an internet design framework that improves positive emotion, this paper adopts a qualitative analysis method to analyze 70 collected studies in the area of regulating emotion and stimulating positive emotions. Additionally, bibliometrics and statistics are conducted to summarize the framework and strategies. Third, two cases of internet design are presented: (a) Internet design that improves users' positive emotions is examined under the background of extreme rainstorm as an example; an applet service design is provided by case study; (b) in the context of COVID-19, we developed an Internet of things interactive design that improves users' positive emotions. Fourth, the internet design framework and the results of the case studies are analyzed and discussed. Finally, an internet design framework is proposed to improve users' positive emotions when they are in a negative mood, which includes the Detachment–empathy framework, External–protection framework, Ability–strengthen framework, Perspective–transformation framework, and Macro–cognitive framework. The framework can help designers to generate design ideas accurately and quickly when users are in a negative mood, to improve subjective well-being, and contribute to the development of internet experience design.

Keywords: Design Framework, Positive Emotion, Internet Design.

A preliminary version of this paper was presented at ICONI 2021, and was selected as an outstanding paper. This research was supported by Graduate Student Innovation Fund of Donghua University (Grant No. GSIF-DH-M-2022010), research grants from Municipal key courses Program of colleges and universities in Shanghai (Grant No. 107-03-0007151, 107-03-0007402), Industry-university cooperation and Collaborative education project from the Ministry of education in China (Grant No.202102122003)

1. Introduction

Anger, rage, worry, dissatisfaction, frustration, contempt, boredom, blue, regret, loneliness, fear, depression... Sometimes, people are filled with negative moods during daily life, which may not be directly affected by material wealth increases or advances in science and technology advances. In recent years, there have been many large-scale negative events, such as the outbreak of COVID-19, flood disasters, and so on. After suffering from the big disasters, people retain their negative moods, which is challenging.

However, with the development of internet technologies, internet products have a bigger impact on users' psychological needs than traditional products [1]. Thus, it is possible to regulate negative emotion by design. So how can internet experience design make boring classroom teaching dynamic or help a friend over a failed relationship? And how can the internet experience be designed to instill confidence in life during social emergencies? Overall, how does internet experience design intervene negative moods and improve users' positive emotions? The main purpose of this paper is to put forward an internet design framework that improves users' positive emotions, helps them change from negative to positive, enriches individual emotional experience, and permits a positive future.

2. Literature Review

2.1 Definition of Emotion

Several hypotheses about the origin of emotions have been defined in psychological literature research, such as basic emotion orientation, evaluation orientation, psychological construction orientation, and social construction orientation [2]. In the field of design application, researchers select emotional psychological construction theory, which is more consistent with the post-Darwinian biological conceptual framework [3]. Additionally, there are multiple brain states (or even a series of consecutive brain states) that can perform a specific instance of a mental category. This finding is demonstrated in iterative reprocessing models [4], in which Cunningham et al. proposed that many different patterns of neural activity (which they termed micro-states) can create a single mental state or emotional fragment (which they termed macro-states). Therefore, it can be seen that the regulation of emotions affects overall mood by adjusting status and cognition so as to achieve the positive experience of users.

In design-related literature, emotion, mood, and affect usually have similar meaning. To clarify the differences between the three words is a key prerequisite for engaging in design-related research. Emotion is the subject's attitude towards the object and the corresponding behavioral feedback. Usually, emotion is a short and strong subjective cognitive-foreground experience with a clear cause [5], while mood is a relatively long-lasting, mild background-cognitive experience [6], which usually lasts for several hours or days. One may not always be aware of their mood, but it presents as a continuous experience under a specific event. Emotion is a temporary foreground experience superimposed on this mood background. Therefore, a mood does not result from a single emotional change but is the result of multiple mixed emotions [7]. Affect is a relatively stable belief, preference, and tendency toward objects, people, or environment [8] (as shown in Table 1).

Table 1. The relevance of emotion, mood, and affect

| | Emotion | Mood | Affect |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------|
| Paths | In the interactive experience with the object, emotions are generated when they are stimulated. | Multiple emotional changes caused by a series of reasons lead to ups and downs in mood. | An innate emotion or acquired long-term emotional tendency. |
| Characteristics | Short-lived, strong, concentrated, obvious, prospective. | Persistent, gentle, scattered, invisible, background. | Related to personality, culture, etc.; not easily changed. |
| Connections | Affect includes mood and emotion. Emotional changes cannot only influence mood, but also emotional judgment. Emotion is the external and intuitive expression of an individual on objective things, mood is a potential condition, and mood influences the interaction between people and products, while also affecting emotions. | | |

2.2 Positive Emotional Design in Internet Experience

In the process of internet experience, users usually get many different emotions, such as happy, boring, or normal. These emotions usually last for a short time. The user's mood can be influenced by the qualities of the internet experience. If the user is sad, he is not interested in highly pleasurable internet interactions. Users' emotions are affected by internet services that they both want to and do not want to interact with. Therefore, emotion and mood influence users' internet experiences at different levels, respectively.

Positive emotional design [9] is a possibility-driven activity with positive value creation, which provides pleasure and meaningful interactive experiences for individuals and communities via innovative products, services, and systems, so as to improve human well-being and the flourishing of communities, contributing to a glorious future.

Along with the development of internet technology, internet experiences are closely related to human-computer interaction, internet of things (IoT). Scholars' research has also gradually turned from the usability and efficiency of the internet to affective and emotional interaction with it [10]. In positive emotional-design exploration, scholars from multiple perspectives have found, for example, the three levels of emotional design [11], emotional sources of product experience [12], positive experience of intelligent products [13], and rich experience research on experience characteristics [14] (see Table 2). In the previous research on positive experience design, scholars have gradually realized that design should not only provide users with pleasure but should also have a long-term positive impact on their personal development [15]. At the same time, some researchers emphasized the richness of experience and proposed that negative emotions play an important positive role in enriching internet experience [16]. Therefore, how to effectively transform negative emotions into positive emotions and enrich internet experience has become one of the future research directions in the design field.

Table 2. Literature of emotional design

| Author | Contribution |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Norman (2004) [11] | Three levels of emotional design are proposed: visceral design, behavioral design, and reflective design. All these levels combined form an effective and impactful design that offers a delightful experience to users. |
| Desmet (2008) [12] | The product-emotion source framework includes X-axis-stimulus: attitude, goal, standard and Y-axis-focus: product, use, result. Different sources and evaluation criteria can produce different emotions. |
| Wu et al. (2021) [13] | The positive experience design approach of IoT intelligent products is proposed from focusing on the personal pleasure experience to individual-meaningful design and social group-relationship design, including individual pleasure experience, personal goal realization, group needs satisfaction, and the harmony of group relations. |
| Fokkinga et al. (2013) [14] | The concept of rich experience is defined as one mixed experience, containing both positive and negative emotions. The ten rich-experience qualities are proposed for designers. |
| Fokkinga et al. (2012) [15] | Four types of protective frameworks are proposed: the safety-zone frame, the detachment frame, the control frame, and the perspective frame. |

Based on the above literature review, positive emotional design in internet experience is to enrich the user's experience perceptions of internet interaction by using design frameworks, so as to bring pleasurable and meaningful emotions to users. Internet experience design can improve users' positive emotions, and negative moods can be used to improve users' internet experience by the emotion regulation.

2.3 Emotion Regulation

"Emotion regulation" is a key issue in psychology, especially in positive psychology, which includes modification of the process of emotion generation or expression [17]. Emotion regulation is defined as the process by which individuals regulate their emotional experience, expression, physiology, and emotion-triggering situations in order to respond appropriately to the changing needs of the environment. Gross [18] described the main features involved in the emotional process between individuals and situations: (a) situation, (b) attention, (c) evaluation, and (d) reaction. This model emphasizes that emotion regulation can operate by changing these features. The Regulation of Emotion Systems Survey includes distraction, reappraisal, rumination, and relaxation suppression and engagement [19]. In addition, there are some studies on the influential factors of emotional regulation strategies and models of emotional regulation (see Table 3).

Table 3. Literature of emotion regulation

| Author | Contribution | Classification |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| Troy et al. (2013) [20] | The degree of individual control of the situation is related to the effectiveness of the cognitive reappraisal emotional strategy. | Influential factors of emotional regulation strategies |
| Gutentag et al. (2017) [21] | Thinking that emotional strategies can improve, they regulate their emotions according to their own wishes for increasing happiness. | |
| France et al. (2021) [22] | The level of perceptual control of emotional arousal may also influence strategy choice, success, and the relationship between strategy using and regulatory success. | |

| | | |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| Sheppes et al. (2014) [23] | Emotional regulation process model: 1. Situation selection, 2. Situation change, 3. Distribution of attention, 4. Cognitive change, 5. Response adjustment. | Emotional regulation models |
| Carver (2013) [24] | Emotional expansion process model regulation. The P (perception component) refers to the perception of what the evaluation system; V (valuation part) refers to an assessment of this perception. | |
| Ryan et al. (2017) [25] | Self-determination theory (SDT) describes three general types of emotion regulation: integrative emotion regulation, controlling emotion regulation, and motivating emotion regulation. | |

The research findings of emotion regulation in psychology are valuable to the study of design. But, in fact, there is limited research on negative-emotion regulation strategies from the perspective of design. However, in the context of the internet era, the positive design framework still needs more research so as to improve users' positive emotions, especially when the users have negative moods. Therefore, this study proposes an internet design framework to improve users' positive emotions.

3. Design Framework

By searching “Emotion regulation,” “Negative emotion regulation,” “Emotion regulation strategy” on the Web of Science, more than 200 pieces of literature were collected from the past five years, and 70 pieces of literature with a closer relationship with emotion regulation were screened out after being reviewed by two researchers. NVivo word-frequency analysis and HANABI data visualization were used to conduct qualitative analysis and feature extraction of the 70 pieces of literature, and a total of 35 emotion regulation strategies were generated, which were roughly divided into five factors based on the temporal and spatial relationship between users and conflict events. Further, conflict events were the main source of negative emotions of users in this study, and events that are contrary to or unsatisfactory to users' psychological and physiological needs imposed negative stimuli on users.

There are 35 emotion regulation strategies in the five factors that are presented in [Fig. 1](#), which are as follows.

Factor 1: Situation selection, participation in conflict events, contribution to society, avoidance, empathic dialogue, deletion of clues. Factor 2: social support, safety measures, positive advice, inner beliefs, situation adjustment, communication problems with loved ones. Factor 3: repression, response regulation, situation control, intrinsic motivation, using emotion as information, emotional labeling, enriching emotional granularity. Factor 4: attention deployment, cognitive reassessment, adding other assessment principles, choosing the positive, focusing on cause and effect, assessing the positive outcome, finding the attribution of responsibility, correlation assessment. Factor 5: meditation, accepting conflicting events, perspectives on personal growth, mindfulness, describing the future, situational imagination, self-actualization.

After data collection, the 35 emotional regulation strategies were then reviewed to eliminate those with a significant negative bias or no positive bias, such as “Avoidance” and “Repression” [26]. Then, from the perspective of design, these emotion regulation strategies were integrated into the following five categories.

Category 1: Users participate in rescue and other conflict-related work to improve their understanding of what happened. When users are far away from conflict events, their

participation and contribution are all for the purpose of generating empathy and enhancing richer experience [27]. Therefore, this is summarized as the Detachment–empathy framework.

Category 2: Users have better protection measures when they are faced with risks brought on by conflict events. When users are faced with such conflict events, both social support and inner belief are ways to gain a sense of security and enhance positive experience through external help. Therefore, this can be summarized as the External–protection framework.

From negative to positive emotion regulation

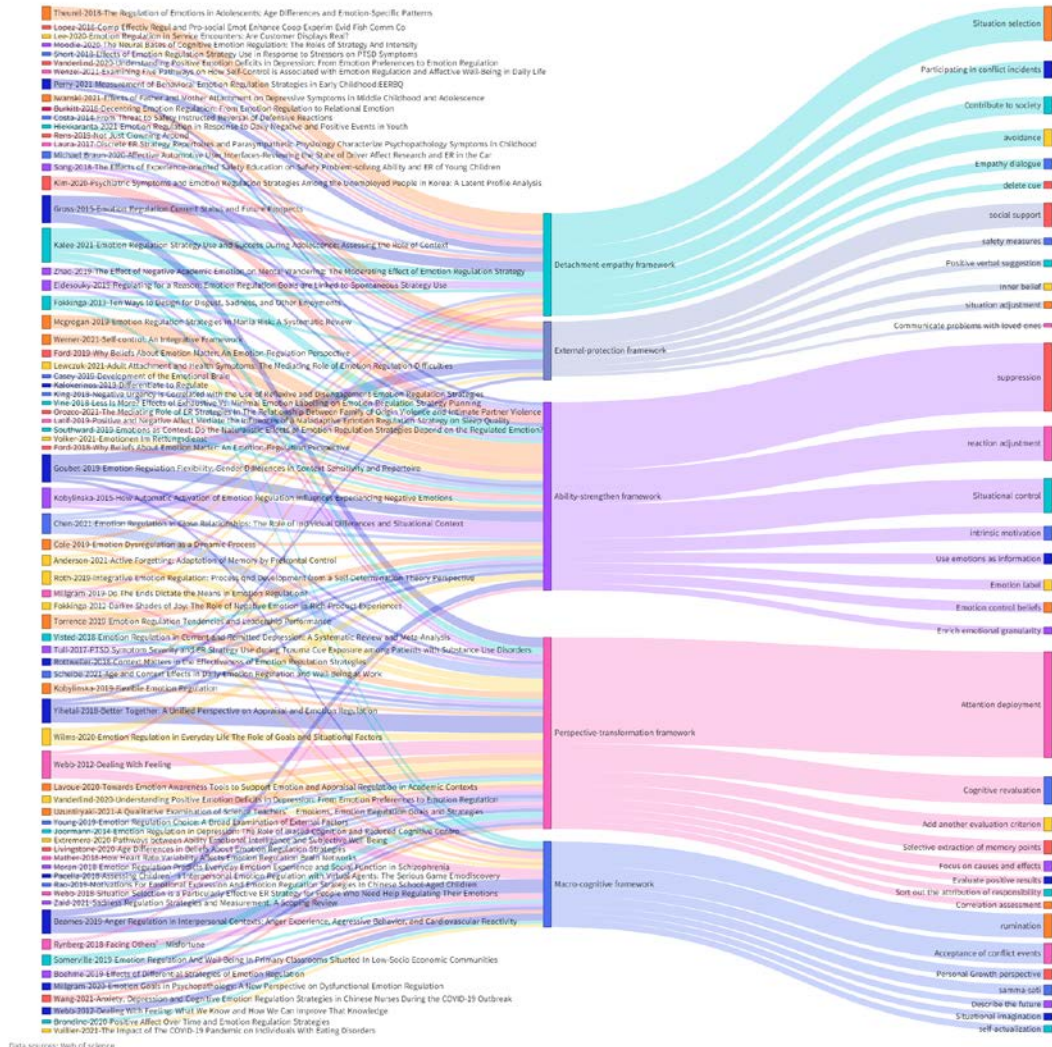


Fig. 1. Qualitative analysis data graph

Category 3: Users have sufficient ability and equipment to solve the conflict events. When users are deeply involved in conflict events, strategies attempt to use emotions as information to enhance intrinsic motivation, which can be regarded as improving users' abilities to control externally or internally, and can be summarized as the Ability–strengthen framework.

Category 4: Users view conflict events with gratitude and a positive perspective. When users safely survive in the conflict event, their focus is still on the event itself. It is shown in the strategy that positive reinforcement or attention deployment is to strengthen the positive help

from others and society in the experience, which can be summarized as the Perspective–transformation framework.

Category 5: Users understand conflict events from a broader perspective, or have expectations for the future. The method is regarded as users' views on the conflict event from a macro-dimension, such as the personal growth perspective or describing the future. This can be summarized as the Macro–cognitive framework.

According to the contents of the framework, the main design is constructed as shown Fig. 2. The design framework has effects on users in a negative mood and generates positive emotion through the interaction between internet products and users, forming a positive outlook on further research. In order to make it easy for designers to operate, the design framework is explained in detail.

Detachment–empathy framework: This means that users and conflict events are separated from time and space. It is a framework to stimulate users' empathy and generate pleasant experience in the state of separation of users and conflict events. From the perspective of time, users have never experienced this conflict event, but this framework can use immersive mourning to make users emotionally aware of negative events [28], thus improving users' subjective well-being of current life and obtaining a pleasant experience. From the spatial dimension, users can participate in the disasters that happen in other places through news reports, photos, and other forms of information, so as to generate corresponding empathy and trigger emotional thinking on the conflict events.

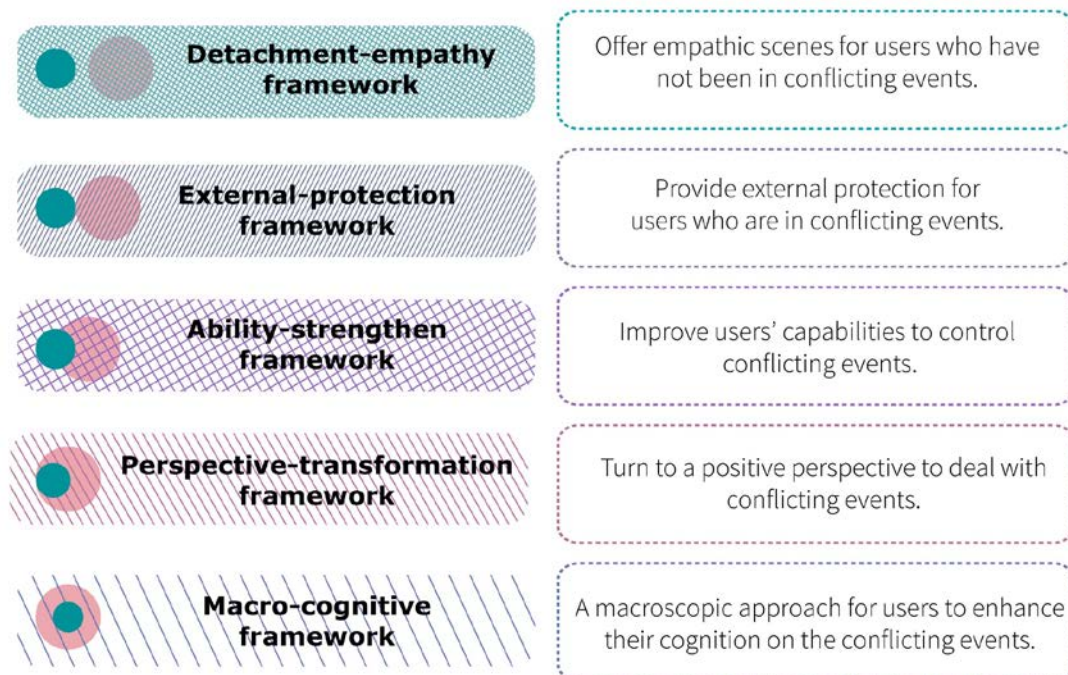


Fig. 2. Design framework for improving positive emotions

External–protection framework: This represents the target users who are facing the risk of conflict events. It is designed to provide users with external security and create a pleasurable experience by satisfying users with the belief of their own security. This framework means two things: a) subjective security, for example, the inner belief, provided through praying and so on, to obtain a strong sense of security [29]; b) objective safety, such as safe isolation,

masks, and other safety facilities that provide protection, the sense of security [30].

Ability–strengthen framework: This means that users are in conflict events. It is designed to enhance users' control over conflict events by improving their own capabilities [31] or adjusting the nature or difficulty of conflict events to generate a pleasant experience. For example, in the process of skydiving, even though the high altitude instills extreme fear into individuals, rich skydiving skills and previous experiences would lead users to believe that they are fully capable of resolving the conflict, which can then stimulate the experience.

Perspective–transformation framework: This represents the situation immediately after the conflict event is resolved, and it is a framework to re-evaluate the impact of the conflict situation on oneself. Similar to reappraisal in psychology, it contains five dimensions: (a) correlation, (b) a degree of negativity or positivity, (c) probabilities of current situation and future expectations and outcomes, (d) attribution of responsibility and obligation, (e) coping potential [32]. The Perspective–transformation framework guides users into making positive re-evaluations of conflict events from the perspective of design, so that negative emotions can be turned into positive emotions [33]. Therefore, this framework refers to the first four dimensions for design-perspective evaluation.

Macro–cognitive framework: This framework represents the situation after the end of conflict events, guiding users to view the occurrence of conflict events from a macro-perspective via design, such as self-realization from the perspective of personal growth, human vision, and other perspectives, and then generating corresponding positive emotions and pleasurable experiences. In this framework, users can share the conflict events they have experienced with others and further increase their acceptance of conflict events [34].

4. Design Implications

To further verify how to apply the design framework to improve users' positive emotions in internet product innovation, two design case studies were collected for innovative design of internet-interactive functions. The first case is an applet design under the background of flood disaster; the second one is an interactive game handle for users in quarantine.

4.1 Case Study 1

4.1.1 Background and Analysis

In July 2021, Zhengzhou, China, was flooded by heavy rain. During the disaster, people were faced with lots of difficulties, such as being injured and trapped, unable to receive timely assistance from external powers, and lack of resources. The trapped people felt despair, fear, anxiety, tension, and other negative moods. In this kind of situation, the target users were divided into three categories: trapped people, warmhearted people, and trapped relatives. The negative emotions mentioned above can be classified and analyze the users' behavioral tendencies, which can be concluded in related internet design frameworks, and are presented as follows.

Negative emotions of the trapped: despair, fear, and helplessness. Behavioral tendencies: seeking help, self-protection, mutual help. Frame analysis: When rescuers are found, they are expected to rescue the moment, which is the performance of the External–protection framework. A trapped person who is swept into the current, floating on the water by means of a basin or a floating board, and protecting himself, is a manifestation of the Ability–strengthen framework. The trapped people, despite the danger, still look forward to the future and encourage their friends to “be positive,” which is a positive attitude generated by the Macro–

cognitive framework.

Negative emotions of the warmhearted: anxiety, sadness, shock. Behavioral tendencies: paying attention to disaster information, donating love, participating in rescue. Frame analysis: Although warmhearted citizens are not trapped in natural disasters, they can feel the plight of trapped compatriots through their mobile phone screens, and have empathy and desire to help, which is the embodiment of the Detachment–empathy framework. The positive donations of money, material, and love is the embodiment of the Macro–cognitive framework. Active participation in rescue activities is an expression of the External–protection framework.

Negative emotions of the relatives of the trapped: anxiety, worry, urgency. Behavioral tendencies: posting information for help, contacting relatives, volunteering to help. Framework analysis: Releasing helpful information is the embodiment of the External–protection framework. Maintaining positive communication with loved ones is the embodiment of the Perspective–transformation framework. The trapped family members who apply to be volunteers and take the initiative to help others, considering the whole event from a macro-perspective, and creating a sense of dedication is the embodiment of the Macro–cognition framework.

4.1.2 Applet Design

Based on the above analysis of emotions, behaviors, and frameworks, five internet-design frameworks are matched with the emotional characteristics of three different groups and their functional definitions, as shown in Fig. 3.

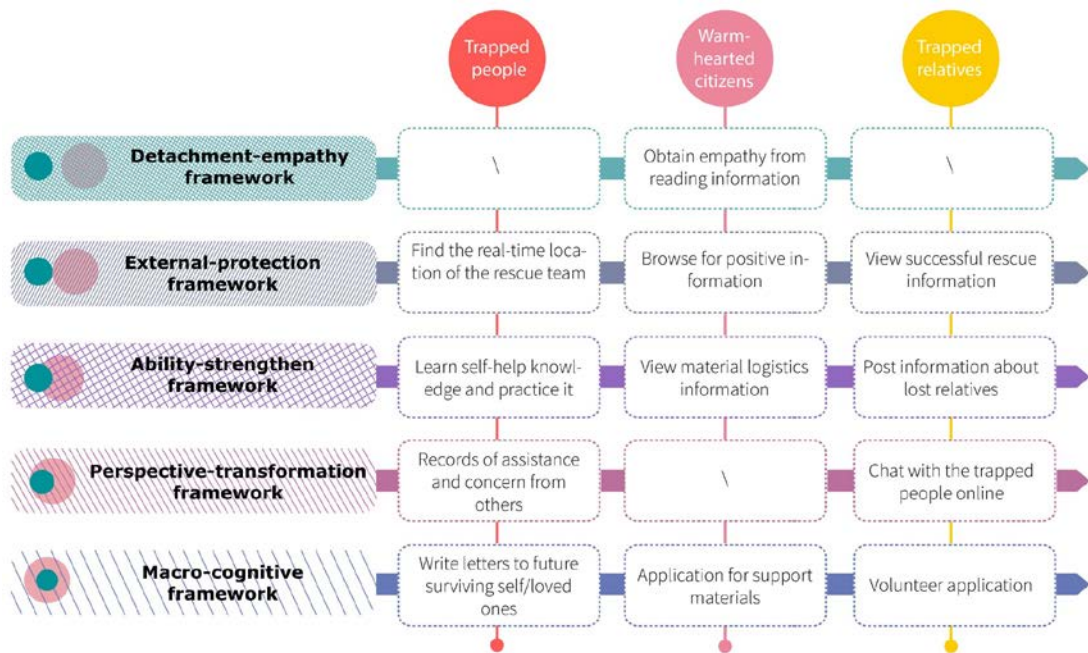


Fig. 3. The application of design frameworks

Detachment–empathy framework: Since the trapped people are already at the center of the conflict and the relatives of the trapped are severely disturbed by the conflict, the Detachment-empathy framework does not work. Warmhearted citizens feel empathy by browsing the real-time information in the applet.

External–protection framework: The trapped people check the real-time position of the rescue team through the applet, which generates a sense of security that they are about to get out of trouble and inspires positive emotions of excitement and expectation. Warmhearted citizens can inspire more positive feelings of security and hope through the applet for the trapped people, who can see the positive media reports. The relatives of the trapped browse the successful rescues through the applet and learn that victims are safe, which inspires positive emotions of warmth and hope.

Ability–strengthen framework: The trapped people learn self-rescue knowledge through the applet, improve self-rescue skills, how to timely escape from danger, and stimulate positive emotions of excitement and courage. Through the applet, warmhearted citizens check the logistics information of the aid materials, improve their sense of control over the relief situation, believe that the aid materials can alleviate the current plight and obtain hope and inspire a positive mood of comfort and expectation. Relatives of the trapped can release information about their lost loved ones through the applet to improve the probability of finding them and see others' positive forwarding, thus inspiring and grateful feelings.

Perspective–transformation framework: The trapped people record the help and care from others through the applet, thus generating solidarity and warmth with other compatriots, encouraging themselves to be stronger and more united. Relatives of the trapped maintain close online communication with the trapped through the applet, and gain stronger care, love, and warmth than in ordinary life [35].

Macro–cognitive framework: The trapped people write and leave messages to themselves/ their relatives in the future, who survived, through small programs that make the trapped people reflect on themselves and the experience of getting along with people around them in such a difficult situation and inspire a strong desire for future life so as to cherish their time and life more. Warmhearted citizens donate objects to the disaster area through the applet, and inspire pride and gratified positive emotions. Relatives of the trapped apply for volunteer services through the applet to help those trapped, improve the rescue rate of trapped people, and inspire a sense of achievement.

Hierarchical Task Analysis was used to analyze the framework functions analyzed in Fig. 3. Internet technology is used to get an applet visual-interface design named “PING SHUI YI FANG” (see Fig. 4) as a metaphor that a party in trouble with assistance coming from others and a lot of help from warmhearted people are sure to help calm the flood, and helping each other is expected, that is, the future is being embraced.



Fig. 4. Applet visual interface design

4.2 Case Study 2

4.2.1 Background and Analysis

COVID-19 has had a profound impact on people's daily lives since 2019. Quarantine is regarded as an effective way to control the spread of coronavirus [36], but it may be a negative experience for quarantined individuals [37]. As they cannot go outside at any time, it means that they might lack interaction with others, resulting in corresponding negative emotions (e.g., loneliness, social isolation) [38]. The negative emotions of nearly half of people in the quarantine may be related to loss of entertainment for a long time. So, why not design a product that regulates the negative emotions and improves the positive emotions of those quarantined?

Based on the background, the design framework for improving users' positive emotions is adopted to analyze the conflict events caused by COVID-19 (as shown in Fig. 5), and the concept of "people in quarantined areas playing sports games together to adjust their loneliness, boredom during quarantine" (see Fig. 5) in the External-protection framework is selected. An IoT game handle can be designed to provide users with opportunities to contact others and provide playability. Through the design and provision of IoT products with the functions of competition games, physical fitness, and contact with others, the external protection of users can be enhanced by fully mobilizing their positive states, regulating negative emotions, such as boredom and anxiety, into positive emotions, such as unity and expectation, and improving the positive emotions of users during the quarantine.

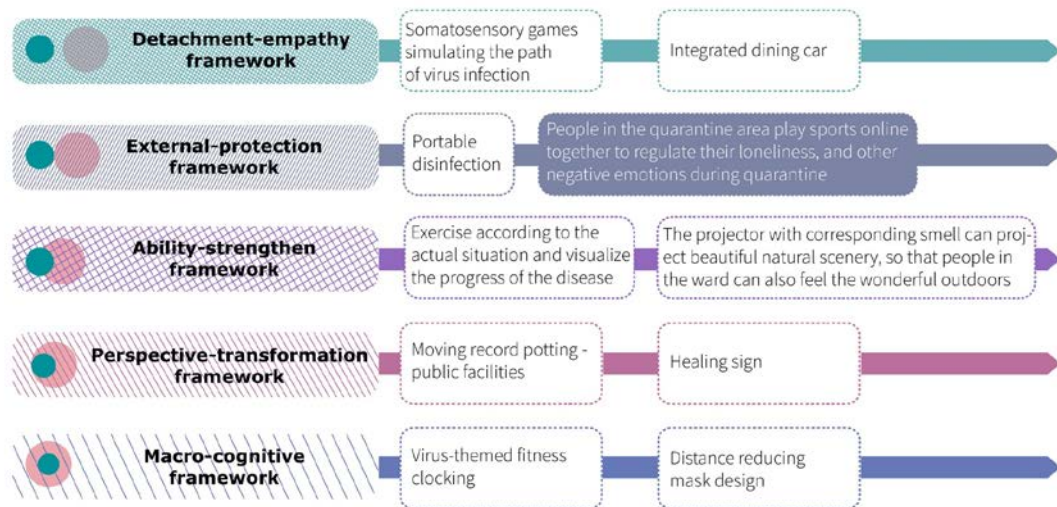


Fig. 5. Conceptual ideas based on the design framework

4.2.2 IoT Product Design

This is an IoT interactive handle that is mainly to regulate the negative emotions in quarantine. It is not only an emotional soft lamp for personal accompaniment but also a game handle that connects friends during isolation, who can play interactive games with other individuals. The product adopts somatosensory technology to realize indoor sports, and Wi-Fi connection technology to interconnect with others so as to decrease boredom, anxiety, and other negative emotions and turn the boring quarantine time into a happy sport's one. The IoT product is composed with three interactive points for improving users' positive emotions: (a) It can

simply and quickly search for others on the interactive interface so as to find a quarantined person to start the game, which can timely relieve the lonely mood of users; (b) when the person is invited, the handle flashes and receives voice from the inviter. Then, you can pick up the handle and play the game; (c) the game handle emits soft light, which can keep users company throughout the night (see Fig. 6).

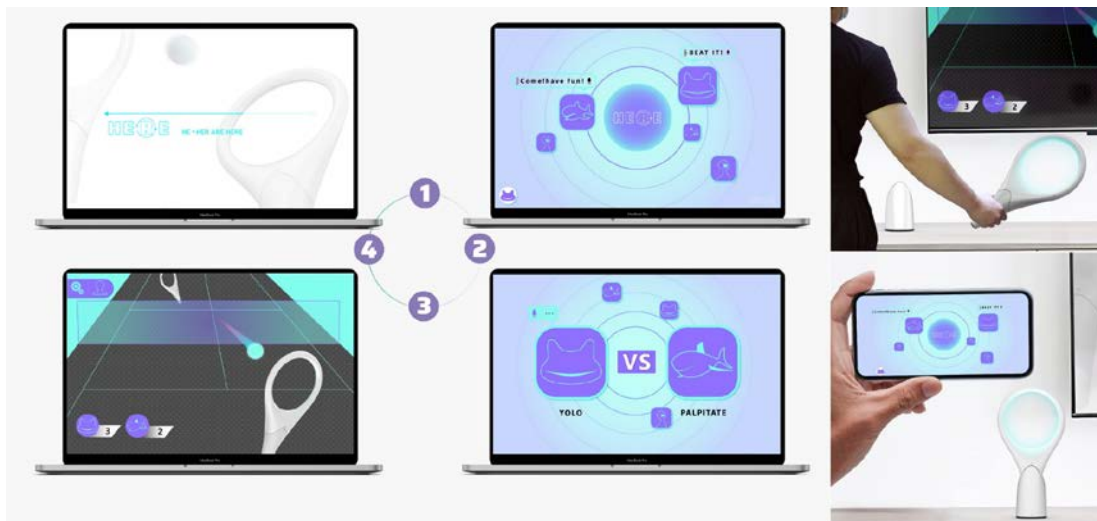


Fig. 6. Interactive game handle

5. Discussion and Conclusion

Previously, the detachment frame, the safety-zone frame, and the confidence frame were proposed by Apter [39]. Fokkinga then enriched on this basis and proposed the protection frame for rich experience: the safety-zone frame, the detachment frame, the control frame, and the perspective frame [15]. The design framework proposed in this paper has a certain correlation with the previous research. For example, the safety-zone frame and the External-protection framework both related to external protection. Users represented by the detachment frame and the Detachment-empathy framework are separated from conflict events by space; these kinds of users are not involved in the conflict events. The control frame emphasizes control over the negative degree of conflict events to make users believe that they have sufficient ability to control conflict events. And the Ability-strengthen framework is mainly about the improvement of users' personal abilities to achieve planning over conflict events. The perspective frame indicates that conflict events have longer meaning and can be associated with human meaning to transform negative feelings, which is consistent with macro-cognition emphasized by the Macro-cognitive framework. However, the Perspective-transformation framework proposes that every conflict event has two sides and advocates focusing on positive interaction via design transformation. Supported by comparative analysis, this paper provides five design frameworks, and further enriches the design framework to improve the positive emotions of users.

In the internet-design practice of the design framework, one concept is usually generated by multiple design frameworks. For example, in the first case study, the trapped person actively receives self-help information and learns self-help knowledge through the applet. Both the Ability-strengthen framework and the Perspective-transformation framework was selected, which can deal with current dilemmas as a skill-based, and experience-enriching

processes. The internet design framework is a system design method with a certain degree of crossover and inclusiveness. Therefore, it can be adopted as an auxiliary thinking framework in the internet-product design process to assist designers in expanding their design ideas. Sometimes, one concept is generated by one framework only. For example, in the second case study, though designers had many ideas, but only one idea which generated by the External-protection framework was selected, which means not all design frameworks are suitable for special design cases.

According to different target objects and behavioral needs, the five internet design frameworks have different effects. For example, in the first case study, the External-protection framework and the Ability-strengthen framework were more convenient to generate effective design concepts for trapped people. For the warmhearted citizens, the Detachment-empathy framework and the Macro-cognitive framework was easier for obtaining effective concepts. However, the Macro-cognitive and Perspective-transformation frameworks were more likely to obtain concepts for relatives of the trapped. Therefore, for different design objects and themes, the emphasis of the internet design framework should be different. Based on the application of the framework, it can be seen that the internet design framework can stimulate positive emotions so as to deal with conflict events. The framework proposed in this study confirms the effectiveness of the early-stage rich experience framework, complements the internet design framework in improving users' pleasant experiences from negative emotions, and enriches positive emotional design approaches. Due to the interactive design to improve positive emotions, the interactive game handle has been nominated for the Italian A' Design Award in 2022.

The contributions of this paper are as follows: Based on the theoretical research of emotional design and emotion regulation, the internet design framework, including the Detachment-empathy framework, External-protection framework, Ability-strengthen framework, Perspective-transformation framework, and Macro-cognitive framework, is proposed to improve users' positive emotions. This paper also verifies frameworks via two case studies, including an applet design, and an IoT product design, and then analyzes and discusses the design framework and design case studies. It provides a design framework for the internet design to improve the users' positive emotions.

The limitations of this paper include that this paper merely presents the preliminary concept generation of the internet design framework to improve users' positive emotions based on the literature review and verifies the framework with a two-concept design. There is no in-depth research on the universality of the design framework nor the effectiveness of the design results. Based on this framework, subsequent research can further enrich theoretical and practical verification and make positive contribution to further research of internet experience design.

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