A Simulation System including Emotional Evaluation

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Abstract. This study proposes a simulation system that utilizes not only physical indicators such as time, but also indexes that show cognitive and emotional satisfaction with services. From an experiment, we obtained emotional values from users' real-time emotional responses to their service experience and post-experiment satisfaction values. We could test an emotional simulation for each user type by extracting the values of each user group. In order to find the most ideal persona ratio for the services proposed, we differentiated the ratio of each of four personas and built a simulation. As a result, the persona ratio of women in their 40s and 50s, whose emotional value in response to the services they experienced was neutral, lowered the overall emotional value in response to the services. In conclusion, this study proves that the service we proposed is an ideal service model for parks that are used far less by women in their 40s and 50s than their male counterparts and females in other age groups.

Keywords: Simulation, Emotion, Satisfaction, Service

1   Introduction

With the popularity of the service industries as a recent social trend, scholars have been actively conducting research on systems that support service design. The simulation system presented in this study allows users to visualize new services that reflect service users' psychological satisfaction with new services in the simulation system. In other words, this system makes it possible to utilize physical indexes such as time and cognitive and emotional satisfaction as simulation indexes and, as a result, it allows users to improve services by reflecting their psychological satisfaction with services and saves the time and costs needed to develop new services.

This simulation system visualizes the service flow by creating a quick-and-dirty digital prototype for service evaluation. It then measures users' instant emotional reactions to the virtual experience and their post-experiment satisfaction. For the measurement of user satisfaction, I conducted subject interviews.

The interview consists of questions that reflect the weighting factors of each task based on the seven indexes of the KS-SQI (Korean Standard-Service Quality Index). The data obtained from the analysis of the virtual experiment (e.g., emotion and KS-SQI Interview) are utilized as simulator drive data for the quality assessment of the service suggestions.

2   Methods

2.1   Stimuli

The Park-Health Care Service, which is presented here as a service sample for this study, consists of three steps, including healthcare planning, exercise, and health checkups, and also includes dietary and eating habit control.

First, a subject visits a temporary community health center in the park and gets a health checkup, then receives a membership card that contains information about the card holder's health status and personal exercise plan. He or she then checks their exercise plan using the membership card. After an exercise, he or she checks the calories burned and gains information about food for physical strength. Figure 1 shows a Kiosk Screen View sample. The following is an assessment of the user's virtual experience of the Kiosk Screen View.

Fig. 1.   Kiosk screen sample views for Park-Health Care Service

2.2. Experiment

The experiment was conducted with 32 participants, including 16 people (eight males and eight females) in their 20s and 30s and another 16 in their 40s and 50s (eight males and eight females) who were interested in the park healthcare service as subjects (age: 36.1 ± 10.9). The experiment began with a preliminary introduction of the park healthcare service to the subjects, followed by a reference measurement for three minutes for inference of the subjects' emotional state and for the experiment. Among the eight tasks of the experiment, Task 6 (pre-exercise task) and Task 9 (post-exercise task), which were relatively more important than the other tasks, were analyzed in accordance with sex and age, among other census indexes.

2.3. Results

This experiment categorized the subjects into four groups or "personas," females and males in their 20s and 30s and females and males in their 40s and 50s, to obtain each persona's attribute value before and after the exercise, which is summarized in Table 1. Then, a simulation was conducted by differentiating the numbers of each persona.

As a result, the simulation shows a decrease in emotional value in response to the service when the persona of women in their 40s and 50s, whose average emotional value is neutral, outnumbers other personas. In other words, the service suggested in this study is assessed as an ideal service model for parks with a remarkably low number of female users in their 40s and 50s.

Table 1. The four types of personas and their attribute values before and after the exercise

		Task	KS-SQI	Emotional State	Time (sec)
20-30s	Male	Before exercise	83.75±9.53	Pleasant	41.25±2.92
		After exercise	84.75±9.22	Pleasant	76.50±4.07
	Female	Before exercise	70.50±11.99	Pleasant	40.38±1.30
		After exercise	71.25±12.31	Pleasant	74.25±2.92
40-50s	Male	Before exercise	76.25±16.82	Pleasant	41.00±4.84
		After exercise	74.38±11.25	Pleasant	76.50±10.18
	Female	Before exercise	82.25±13.96	Neutral	43.50±3.82
		After exercise	78.63±8.02	Neutral	74.00±2.00

3   Conclusion

This study shows users' real-time emotional responses to each type of service they experienced and their satisfaction to post-experiment. In order to verify the suitability of the proposed service model, this study differentiated the number of each persona.

The experiment shows that the Park-Healthcare Service we have proposed is most ideal for parks that are used by women in their 40s and 50s far less than other age groups. This study proves that the simulation system, which includes emotion assessment, is useful when it presents a service model for a specific user group. It also shows that research on the creation of service indexes for other simulations is imperative in order to make this simulation system more efficient.

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