Thank you, Waiter: Redesigning point-of-sale (POS) user interface for restaurants.

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Waiters are crucial to the smooth operation of a restaurant. They're also important for keeping a large number of customers happy at the same time. The waiter's workload can be stressful at times, and research has shown that gratitude can improve people's well-being. However, customers rarely take the time to appreciate the waiter in today's fast-paced world. One way to express gratitude is to write thank you notes. Customers may find that writing a thank-you note is time-consuming and inconvenient, preventing them from effectively expressing their gratitude. According to research, emojis and stickers, rather than plain text, are preferred by most people. Our study's goal is to create an interactive interface that uses emojis to express gratitude. Our research looked into why people don't express gratitude in traditional ways. According to our findings, the majority of participants felt they were able to express their gratitude and agreed that in the future, they would prefer an interface that allows them to use emojis to express gratitude.

1 INTRODUCTION

Restaurants have traditionally played an essential role in people's social lives. The primary purpose of the restaurant is to provide food and drink. They are commonly used to commemorate personal and professional milestones in people's lives. Restaurants also have an immense contribution to the local economy. According to the US Census, an estimate of U.S. Retail and Food Services sales was $665.7 billion for March [10]. Moreover, restaurants have a significant influence on the economy of the tourism industry since they provide travelers with more than simply meals and waiters play an essential part in providing an excellent experience to the customers. Waiters are essential to a restaurant's smooth running since they are crucial in facilitating communication between the kitchen and the clients. They also play an essential part in keeping a large number of clients happy at the same time. However, they face several difficulties in the workplace.

According to the National Restaurant Association (NRA), 15.6 million people are expected to work in the restaurant business in 2020 [8]. Among them, more than 150 thousand people worked as waiters in restaurants, according to the US Bureau Of Labor Statistics[10]. Waiters' principal responsibilities include remembering and describing the menu. Sometimes, the task of elaborating menus for the customers becomes tedious and repetitive for waiters. In addition, their responsibilities also include remembering any special requests. Customers become dissatisfied with waiters when they cannot grasp their orders. Furthermore, the waiters need to handle customers when customers are disappointed with the food. They also have to deal with job instability. A waiter is likely to experience worry and stress due to all of these issues. According to a study undertaken by the National Institutes of Health, waiters suffer from a variety of mental health difficulties as a result of their working environments[9].

Multiple types of research using various methods imply that higher levels of gratitude are associated with higher levels of well-being [20] [5]. Multiple research has revealed that gratitude has valuable advantages, such as lowering the negative impact of stressful circumstances on well-being [3] [4]. Research has shown a correlation between gratitude and job stress [6]. The study shows that the higher the gratitude is, the lower the job stress is. Thus, we can infer that gratitude can help waiters reduce their work stress to some extent. However, in today's fast-paced world, customers often do not take the time to appreciate the waiter. Waiters sometimes receive verbal recognition for their good job. Although verbal appreciation can significantly increase a waiter's morale, this recognition often goes unnoticed by employers. After paying the bill, some restaurants allow customers to leave a written note. Some point-of-sale (POS) systems also feature a written message to express gratitude. However, the feature of leaving notes in advanced POS systems is not integrated properly in many systems. Writing a note can be time-consuming and inconvenient for customers, and as a result, consumers cannot effectively express their gratitude to waiters. With the rise of smartphone usage, people, in general, are comfortable with communicating with digital technologies. Furthermore, research has shown that usually people prefer using emojis and stickers to convey their feelings rather than writing plain texts [7].

The goal of the study was to develop an interactive POS to show gratitude towards the waitstaff. The proposed system consisted of emojis and stickers to show thankfulness to the waiters and it was incorporated with the existing POS system. The research aimed to answer this question: 'what is the effect of our proposed interactive POS system on customers to express gratitude towards the waiter?' The study was performed on thirty people who frequently visit restaurants. In our study, we conducted an informal interview where we had interesting findings regarding people's thoughts about expressing gratitude in a traditional way. The majority of participants in the study revealed that they didn't notice any visual medium to express their gratitude in the usual setting. However, the participants said that if they were given a choice to express their emotions through some digital medium they would prefer that. The result of our post-experimental evaluation indicates that participants were comfortable and eager to show gratitude using our proposed system. Our belief is that the consequent outcome of this study will help in developing future user-based applications that involve the human interaction of hospitality providers.

2 BACKGROUND STUDIES

A large body of evidence has emerged in recent years proving that gratitude is intimately related to all aspects of happiness[1]. There is mounting empirical evidence that gratitude motivates prosocial behavior. McCullough et al.[11] state that psychologists usually understand gratitude as a pleasant feeling that arises from the idea that one has benefitted from another person's expensive, purposeful, or willing deed. The authors claimed that displays of appreciation (such as expressing "thank you") promote prosocial conduct by validating benefactors' efforts on others' behalf and increasing the chance that benefactors will behave prosocially again in the future. This type of thanking behavior is common in various situations where benefactors provide people with services that they value. According to a previous study, benefactors who are praised for their efforts are more willing to give more and work more than benefactors who are not thanked. In the other study, Wood et al.[12] suggest a new concept of thankfulness that arises as a result of others' assistance. Here the authors state that gratitude relates to well-being, coping, good affect, and broaden-and-build principles.

Waiters at restaurants are one of the most important benefactors of the service sector because of the services they provide. There are various ways to express gratitude to benefactors. For example, verbal "Thank you" is the most common way to express gratitude. However, the verbal expression of gratitude may go unnoticed by waiters' employers during busy service hours. As a result, a handwritten or technology-driven appreciation display option can assist in

retrieving the customer's thankfulness, which can be acknowledged at any moment. Another common method of expressing thanks is to write a "Thank you" letter, which helps to appreciate the waiters at any moment. Medinaet al.[13] states that the written thank-you letter not only serves as an expression of gratitude but also confirms interest in the position and reinforces the memory. Rind and Bordia et al.[14] find that writing "thank you" on a restaurant bill is also a form of gratitude. The user study demonstrates that writing thank you notes on the back of the check is a means of expressing thanks and that is also helps to enhance the waiter's tips, which is another kind of thankfulness. On the other hand, nowadays, because of the enhancement of technology and people's value of time, most people are not eager to write handwritten text. Jansen et al.[15] evaluated user research and found that technology-based written notes performed better than handwritten notes on copying the alphabet, writing sentences, and identifying words. It demonstrates that consumers prefer a technology-based approach that allows them to work quickly and efficiently. Recent studies have shown evidence that technology-mediated gratitude interventions can positively affect gratitude expression and well-being. Bunn, Benjamin, et al.[16] explore augmented reality (AR) as a new way to experience gratitude and inspire gratitude in others. They have created GoGratitude, an AR application that allows users to create and view digital messages of gratitude connected to a physical location. This study demonstrates the potential of using AR technology in new ways to positively influence the human-centered design space of gratitude. As a result, for showing gratitude towards the benefactors like waiters in restaurants, there needs to be some technology-mediated gratitude interventions.

Since the immense popularization of social media and technological advancements in digital technology, emojis have witnessed an increasingly widespread use among different age groups and genders. Stark and Crawford et al.[17] stated that emojis act as historical, social, and cultural objects, forming a type of language that can help to underscore tone and communicate humor. It allows users to express their personality through their online interactions and relay a form of digital feeling which is more expressive, less time-consuming, and more convenient. Al-Rawi, Ahmed, et al.[18] described that emojis also allow the users to express their characteristics that inform their identities and help express users' feelings. Moreover, in recent years, POS systems with a restaurant order function have been developed, mainly wireless hand-held devices. This POS system has functions of printing customer's checks, printing orders to kitchens and bars for preparation, processing credit cards and other payment cards, and running reports[19]. As the POS system is a handy tool with the software-driven system, many interfaces can be applied here. In addition, some POS systems involve writing messages in the remark area to express individual thanks to the waiters. According to a prior survey, customers are unwilling to leave remarks in the comment box since it takes time and is inconvenient. For this reason, in this study, we developed a POS system with a new interface where emojis are used to express gratitude toward waiters. This system uses the new POS system technology with a time-efficient and convenient way of showing gratitude with emojis or stickers, which helps customers express their feelings.

3 METHODOLOGY

This study developed a system by which customers can express their gratitude toward restaurant waiters. Our proposed system depicts a POS user interface with choices for showing gratitude to waiters by using thank you emojis and stickers. We performed an informal interview to learn more about how customers show gratitude. The experimental study evaluated the customer's perspective of showing gratitude towards waiters by using our designed prototype of the POS system. This study aimed to assess whether our proposed POS system helped customers to convey their gratitude towards waiters and if it could assist customers in expressing gratitude better than traditional POS systems. To evaluate this, first, customers participated in an informal interview. Then customers interacted with our proposed

prototype of a POS system for expressing gratitude and answered post experimental questionnaires. The experiments helped in the evaluation of our system as well as the evaluation of changes reflected in traditional and existing systems, as indicated in the following sections.


Fig. 1. Prototype of our proposed Interface.

3.1 Participants

Our target users for this experiment were customers in restaurants. We conducted our study by selecting thirty participants from different backgrounds (technical and non-technical) who visited restaurants regularly and had familiarity with the restaurant's POS system. We defined frequent visits to restaurants as at least once every three months. As a result, we anticipated attracting a varied range of clients of various ages where the participants' ages were between 18 and 30 years old. They were chosen through a public advertisement on social media in restaurant-related organizations. Each participant's only requirement was to meet the frequency of going to the restaurant with prior knowledge of using the restaurant's POS system.

3.2 Materials

We developed a user interface for a POS device. In this study, the waiters approached the customers with a portable POS system. Therefore, we implemented an ios/android tablet as a mock handheld-POS system. The device includes a 9.0-inch touchscreen display and will run on battery power. The device's physical dimensions are approximately 9-inch * 6-inch * 0.3-inch. The weight of this device is about a pound in weight. The system has an interface with emoticons and a thank-you sticker to convey customers' gratitude toward waiters. Customers can complete the job by taping the selected emoji or sticker. Figure-1 shows the reference interface of out POS prototype where customers can select one emoji or sticker to express their gratitude.

3.3 Design

This study utilized a within-subject design in which all individuals participated in each condition. Since we recruited participants who went to restaurants regularly (at least once every three months), thus everyone had experience with the traditional POS system, which has the functionality of printed receipts and signatures or comment cards. In this study, all the participants participated in the informal interview and interacted with our prototype. At the end of the experiment, participants filled out a post-experiment questionnaire form containing gratitude assessment questions. The full timeframe of our experiment was estimated to be 15 minutes long, with 5 minutes allocated for an interview, 5 minutes for prototype interaction, and 5 minutes for filling the post-experiment questionnaire form.

The independent variable of our study is the medium of the interaction of the POS system, which has two levels. The first level is the traditional POS systems for showing gratitude to waiters, and another level is our proposed POS system with a gratitude showing interface. The participants with prior experience used our proposed system, selected emojis, and thank-you stickers to show their gratitude. The perceptions of gratitude are the dependent variables in this experiment. Here, we are defining gratitude within the context of receiving positive feedback after interacting with the proposed POS system. Positive feedback comes in the form of conceiving feedback from the questionnaires.

3.4 Procedure

We did our study near the downtown area in South Central United States. In this study, first, we conducted a short interview and asked some questions to the participants. Second, the participants used the prototype of the POS system. Finally, we provided a set of questionnaires to the participants, and they answered the questions and provided ratings based on the questions. Both studies enlisted the participation of all thirty persons.

After selecting the target group of customers who have experience of visiting restaurants often, we conducted an informal interview which helped us assess between the traditional POS system and our proposed POS system. The discussion helped us determine that the customers felt the significance of showing gratitude. Furthermore, it helped us figure out the problems associated with existing POS systems to show gratitude. The typical response of the participants was that they did not see any medium to express gratitude towards the waiters except verbal recognition and tips. When asked if the participants were given an option to show gratitude using a comment card or check boxing a comment card, all participants replied they wouldn't do that. They stated that it is time-consuming, inconvenient, and inefficient. We asked the participants in the interview if, if they had an option to express their feeling through a digital interface (i.e., emoji, sticker) after service and billing would they use that. 80% of the responses from the participants were positive. The questions of the interview are given below:-

(1) When was the last time you went to a restaurant?
(2) Do you feel that waiters/servers are essential in a restaurant?
(3) Do you think that waiters/servers need to be thanked for their service and assistance?
(4) Do you usually express gratitude to the waiters for their assistance?
(5) If so, how would you express your gratitude?
(6) Do you believe the current POS system helps you in reminding people to express gratitude? If not, please explain why?
(7) Do you feel that this existing system is time-consuming and inconvenient?
(8) Would it be useful for you if you had an interface where you could show your gratitude with a single click?

After the interview, we asked the participants to use our proposed POS system. Customers notably used the emoji interface in this phase, where the different emoji possibilities assisted them in expressing their sentiments and conveying expressions of gratitude.

Finally, our user study consisted of gathering input from participants by giving them a set of questionnaires. We used questionnaires to evaluate participants' implicit positive feedback during their interactions with our system. We designed our questionnaires to include five multiple-choice survey items to gauge each subject's stated gratitude during the experiment. We used the renowned success of the Likert scale for subjective evaluations. We designed each of our question's responses using a 5-point Likert scale(Strongly disagree, Disagree, Neutral, Agree, Strongly Agree). The following are the questions we had posed:

(1) Does the interface for selecting emojis are easy to understand?
(2) Do you agree with the following statement:- I enjoyed using the new interface to express my sentiment?
(3) Do you agree with the following statement:- I was able to convey my gratitude properly?
(4) Do you agree with the following statement:- The emojis helped me express my feelings?
(5) Do you agree with the following statement:- I would prefer emojis over writing a note to express my gratitude?

The 1st question helped us to estimate the acceptance of our prototype. The second question helped evaluate the user's comfort with the usage of the prototype. The following two questions helped us understand if the customers felt they could reach their goal of showing gratitude. Finally, The final question helped us understand if customers thought they could reach their goal of showing gratitude and how customers felt about our system.

4 RESULT

Categorization	Questions	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Learnability	Does the interface for selecting emojis are easy to understand?	26	3	1	0	0
Enjoyable	Do you agree with the following statement:- I enjoyed using the new interface to express my sentiment?	9	18	3	0	0
Effectiveness	Do you agree with the following statement:- I was able to convey my gratitude properly?	9	19	2	0	0
Effectiveness of Emojis	Do you agree with the following statement:- The emojis helped me express my feelings?	11	18	1	0	0
Future Preference	Do you agree with the following statement:- I would prefer emojis over writing a note to express my gratitude.	15	9	5	1	0

Table 1. Result of user survey in Likert chart.

We observed participants' interaction with our proposed system and analyzed their actions. While using the POS system, twenty-eight participants (93%) chose one of the emojis, while two (6%) chose none. The average time spent interacting with the POS was about 40 seconds.

Table-1 shows the results of the post-experimental questionnaire's Likert chart. In figure-2, we plotted the result as a bar chart. The results showed that twenty-nine participants (96%) agreed that the system was easier to understand and that twenty-eight participants (93%) felt they could express their gratitude to waiters. Thirty participants (80%)
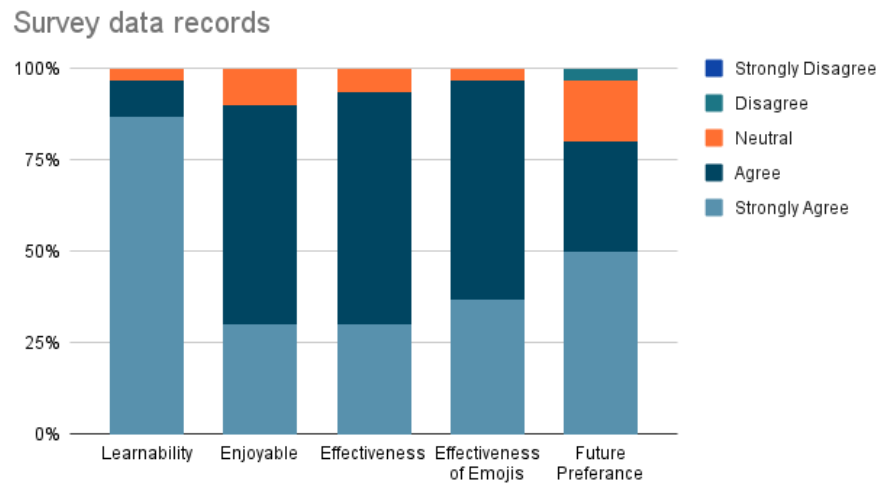
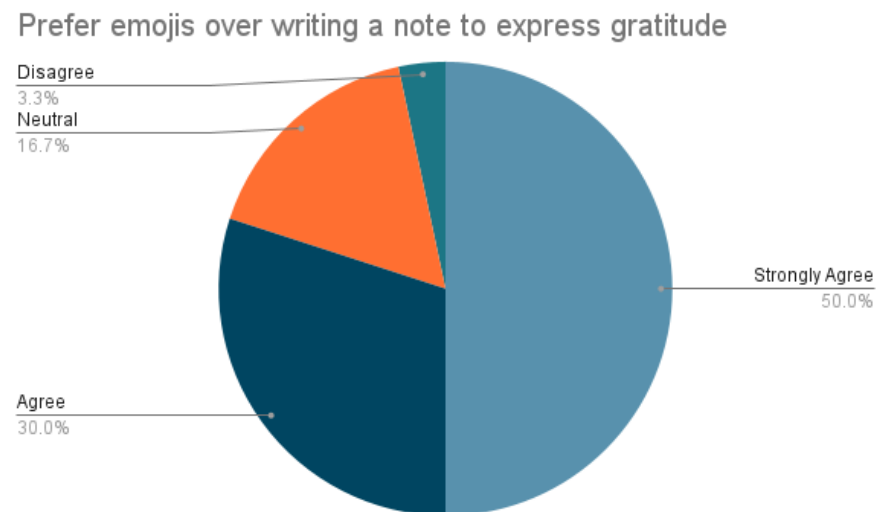Fig. 2. Survey Data shown in percentage bar-chart

Fig. 3. Survey data on preferring emojis over writing a note to express gratitude

agreed that they would prefer emojis over writing a note to express gratitude, while five (16%) were neutral and one (3%) disagreed (Figure-3).

5 DISCUSSION AND CONCLUSION

There are very few works done from a customer perspective in the field of expressing gratitude in the hospitality providing industry. We conducted an informal interview before our experiment which helped us to gain insight into customers' points of view in expressing gratitude towards waiters. As this was an informal interview, it was not possible to show it quantitatively. Few of the participants mentioned that if they get a fast convenient way to express gratitude, that will be more convenient for them. Although during the interview 20% of participants said they will not use emojis in a digital POS system to convey gratitude, after interacting with the interface, 50% of these participants have changed their opinion about using the interface in the future. Also, the interface of giving emojis appeared after paying the bills and tips, as a result, our system doesn't have any impact on the monetary aspect. In the future, it is possible to do a user study on a bigger scale and on a diverse population of a bigger age range to see what is the impact of this new interface on the customers of different ages and cultures. Also, doing a user study from the waiters' perspective can be a good insight. In conclusion, we have seen that the majority of the participants (93%) felt that they were able to convey their gratitude and 80% agreed that they will prefer this interface in the future where they can use emojis to express gratitude.

REFERENCES

[1] Bono, Giacomo, Robert A. Emmons, and Michael E. McCullough. "Gratitude in practice and the practice of gratitude." Positive psychology in practice 464 (2004): 481.

[2] Cohen, Sheldon, and Thomas A. Wills. "Stress, social support, and the buffering hypothesis." Psychological bulletin 98.2 (1985): 310.

[3] Watkins, Philip Charles, R. A. Emmons, and M. E. McCullough. "Gratitude and subjective well-being." (2004): 167-92.

[4] McCullough, Michael E., Jo-Ann Tsang, and Robert A. Emmons. "Gratitude in intermediate affective terrain: links of grateful moods to individual differences and daily emotional experience." Journal of personality and social psychology 86.2 (2004): 295.

[5] Watkins, Philip C., et al. "Gratitude and happiness: Development of a measure of gratitude, and relationships with subjective well-being." Social Behavior and Personality: an international journal 31.5 (2003): 431-451.

[6] Sari, Kartika, Devy Novianty, and Arum Sulistyani Mirza. "The Relationship between Gratitude and Job Stress Guard Officers at State Prison." Database 121.75 (2020): 161.

[7] Zhou, Rui, Jasmine Hentschel, and Neha Kumar. "Goodbye text, hello emoji: Mobile communication on WeChat in China." Proceedings of the 2017 CHI conference on human factors in computing systems. 2017.

[8] Total Restaurant Industry Sales." NRA, https://restaurant.org/research-and-media/research/economists-notebook/economic-indicators/total-restaurant-industry-sales/. Accessed 6 May 2022

a9 (Waiters), https://www.bls.gov/oes/current/oes353031.html

[9] Saah, Farrukh Ishaque, Hubert Amu, and Kwaku Kissah-Korsah. "Prevalence and predictors of work-related depression, anxiety, and stress among waiters: A cross-sectional study in upscale restaurants." PloS one 16.4 (2021): e0249597.

[10] (SSSD), https://www.census.gov/retail/index.html

[11] McCullough, Michael E., Robert A. Emmons, and Jo-Ann Tsang. "The grateful disposition: a conceptual and empirical topography." Journal of personality and social psychology 82.1 (2002): 112.

[12] Wood, Alex, Stephen Joseph, and Alex Linley. "Gratitude-Parent of all virtues." PSYCHOLOGIST-LEICESTER- 20.1 (2007): 18.

[13] Medina, Melissa S., and Trager D. Hintze. "Postinterview etiquette: Tips for writing thank-you letters." American Journal of Health-System Pharmacy 78.3 (2021): 184-186.

[14] Rind, Bruce, and Prashant Bordia. "Effect of server's "thank you" and personalization on restaurant tipping 1." Journal of Applied Social Psychology 25.9 (1995): 745-751.

[15] Jansen, Renée S., Daniel Lakens, and Wijnand A. IJsselsteijn. "An integrative review of the cognitive costs and benefits of note-taking." Educational Research Review 22 (2017): 223-233.

[16] Bunn, Benjamin, et al. "GoGratitude: Using Augmented Reality to Inspire Gratitude." CHI Conference on Human Factors in Computing Systems Extended Abstracts. 2022.

[17] Stark, L., and K. Crawford. "The conservatism of Emoji: work, affect, and communication. Soc. Media+ Soc. 1 (2), 2056305115604853 (2015)."

[18] Al-Rawi, Ahmed, et al. "COVID-19 and the gendered use of emojis on Twitter: infodemiology study." Journal of medical Internet research 22.11 (2020): e21646.

[19] Kashima, Tomoko, Shimpei Matsumoto, and Hiroaki Ishii. "Recommendation method with rough sets in restaurant point of sales system." Proceedings of the International MultiConference of Engineers and Computer Scientists. Vol. 3. 2010.

[20] Nezlek, John B., et al. "Within-person relationships among daily gratitude, well-being, stress, and positive experiences." Journal of Happiness Studies 20.3 (2019): 883-898.