A Dedicated Platform for Health-Safety Reviews

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Abstract. In addition to health consequences, impactful life changes, and losses, the COVID-19 pandemic has resulted in a worldwide economic emergency. Particularly, small businesses in key sectors, such as the hospitality and food industries, have incurred significant losses due to mobility restrictions, distancing requirements, and reduced service. Simultaneously, individuals have reduced their travels and visits to businesses and public places because of concerns related to the Coronavirus outbreak. In this paper, we introduce a web- and mobile- based platform dedicated to health-safety ratings and reviews. The system aims at helping businesses maintain a health-safety profile, address their customers' expectations, and invite them to restore their habits safely.

Keywords: business reviews, health safety, COVID-19, pandemics.

1 Introduction

In addition to changing most aspects of individuals' personal lives [1], the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) pandemic has resulted in a significant impact on businesses, causing major economic losses to owners and even closures due to the length of the emergency [2]. Recent data show that the impact of the economic crisis caused by the pandemic can be compared to the Great Depression [3]. This, in turn, has produced higher unemployment rates, affecting society even further. According to recent reports, 40 million people lost their job in the first two months of the Coronavirus disease 2019 (COVID-19) pandemic in the United States alone [4].

Indeed, small businesses suffered more than large companies [5] because most of them have limited liquidity and, consequently, only a few can sustain more than three months of an economic shutdown [6]. For instance, most small businesses in the hospitality and food industries were particularly impacted by mobility restrictions such as shelter-in-place, curfew, and lockdown orders, as well as by service limitations, including social distancing requirements and reduced hours. A recent study showed that most restaurants operated at between 10% and 20% compared to 2019 [7]. Although regulations in most countries allowed carry-out, this resulted in a significant margin loss due to delivery costs. Several businesses reported that take-out orders enabled them to barely cover their operation costs, and they accepted orders to avoid losing their customer base [8].

Unfortunately, the general uncertainty in regard to the evolution of the situation, together with changes to regulations introduced as a response to new waves of contagion, increased the impact because they did not enable owners and managers to prepare in advance, schedule their operations, or plan their budget appropriately. In addition to a revenue loss, in many cases, businesses were required to adopt health-safety measures and equipment, including shields, signs, and sanitization, which increased their costs, without resulting in any benefit due to further restrictions and closures.

In addition, businesses were impacted by customers' fear: many preferred not to leave the house during the early and acute phases of the pandemic, whereas others limited their visits to stores and restaurants for reasons related to compliance with health-safety measures. For instance, in a recent study about individuals' perception and behavior during the COVID-19 pandemic [9], most respondents reported that they avoided eating out or shopping because of the fear of being in contact with employees and other customers. Furthermore, health concerns are expected to have a long-term effect on consumer behavior.

Nonetheless, as the pandemic increased Internet use, it contributed to the success and growth of review platforms. Specifically, customers started to utilize them to search for or contribute COVID-19-related information [10]. In addition to rating the quality of the business based on aspects related to their expected level of health-safety (e.g., sanitization, social distancing, and temperature checking), in several cases, reviews have been based on individuals' perception of other customers' compliance with prevention measures (e.g., properly wearing a mask). This, in turn, decreases the perceived quality of the business regardless of its service and creates lasting image damage. Based on the results of a recent study, a one-star increase on online platforms (e.g., Yelp and TripAdvisor) rating leads to a 5-9 percent increase in revenue. On the contrary, as few negative ratings and reviews have a great influence on customers' decisions, customers' experiences related to health-safety factors are causing even bigger losses to business [11].

Although recent advances, including the collection of complete information about Coronavirus, the standardization of prevention measures, and the development of vaccines, are expected to end the pandemic, the COVID-19 crisis demonstrated the need for solutions that help the manyfold consequences of worldwide emergencies with multifaceted tools.

In this paper, we present the user acceptance study of a system designed for enabling customers to rate and review businesses based on several health-safety measures (e.g., social distancing, sanitization, use of masks). Data collected from business owners and customers enabled us to co-design a user-centered solution that takes into consideration public safety as well as individuals' different perspectives and priorities. By doing so, our platform aims at increasing customer and business awareness, improve mutual trust, and encourage individuals to eat and shop out safely.

2 Related Work

A recent study [12] documents that the scarcity of information about businesses in the hospitality industry is a significant factor because it influences customers' decisions and, specifically, discourages individuals from making a reservation. On the other

hand, the lack of information about customers' preferences prevented businesses from defining adequate strategies to counteract the financial impact of the COVID-19 health crisis.

Indeed, the unexpected spread of Coronavirus, the rapid escalation of the SARS-CoV-2 health emergency, the often-divergent perspectives of political leaders, and the different adoption timelines of restrictions that aimed at flattening the infection curve made it difficult for businesses to join efforts and develop a common strategy to counteract the impact of the pandemic. Similarly, a one-size-fits-all approach would not have been suitable due to the heterogeneous and continuously changing requirements established by national governments and their different local implementations based on the evolution of the situation and on the number of cases.

As the main priority was ensuring the safety of their employees and customers while limiting financial losses, businesses focused their research and development efforts on adopting practices and equipment that enabled them to comply with health-safety requirements. Simultaneously, they worked on securing some form of revenue by adopting online services and Internet-based solutions, including e-commerce platforms, delivery applications, and other types of digital services. Unfortunately, among the solutions that have been introduced in the market since the inception of the pandemic, there are no systems that enable informing customers about the safety of businesses and their compliance with the recommended health measures for COVID-19.

As a result, there is a lack of tools that enable customers to check whether a business properly adheres to mandatory health-safety guidelines and adopts enough preventive measures. Indeed, popular review platforms such as Yelp, TripAdvisor, Google, and Trustpilot, provide users with the opportunity of rating businesses and leaving comments based on the perceived Quality of Service (QoS) experienced during their visit. However, all the review platforms do not have any options for rating the safety of the location as far as COVID-19 standards are concerned.

In 2018, Yelp introduced the hygiene scores [13]. However, it primarily has the purpose of enabling customers to evaluate adherence to food regulations and report non-compliance or incidents (e.g., food poisoning). Thus, it does not capture any of the aspects involved in preventing the spread of COVID-19 (e.g., social distancing, use of face masks, temperature checks). Similarly, other systems, including Uber, Airbnb, and Booking.com, ask their users to fill customer reviews that enable specifying a score for specific categories (e.g., cleanliness), which do not provide prospect users with any useful information with specific regard to COVID-19.

Although several websites that offer listings have incorporated an alert message that invites them to adopt health-safety measures, they do not include ratings based on COVID-19-related information collected from their users. As a result, a business that does not take the necessary steps to keep its customers safe incurs the risk of receiving a poor rating or review. However, this information does not result in any immediate benefit for customers who are interested in knowing more about the many-fold dimensions of Coronavirus safety. Simultaneously, unless clearly detailed in a comment, any negative feedback in the form of rating or review impacts the reputation of a business without resulting in any actionable information.

3 System Design

In this section, we describe the user-centered design of a novel web- and mobile-based review platform that enables customers to rate businesses and public places based on multiple measures regarding health-safety practices that are relevant for contrasting emergencies such as outbreaks and pandemics and for helping individuals feel more comfortable with visiting businesses. The first step of our work consisted in evaluating users' trends with respect to the consumption of information on websites and rating and review platforms during the COVID-19 pandemic. To this end, we created a survey targeted to customers (instead of business owners), and we distributed it on Social Media and to personal contacts, inviting respondents to recruit more participants (i.e., snowball sampling). During the data collection period (i.e., two weeks), 210 individuals completed the survey. Although our data show no statistical difference with the period before the pandemic as far as new installations of rating and review software, respondents indicated an increased interest (+59%) in using websites, search engines, mobile applications, and review platforms for searching and sharing information about the health-safety practices adopted by businesses. Specifically, our data indicated a shift in individuals who were already familiar with customer review systems in that users focused on COVID-19-related aspects rather than QoS. Furthermore, 73% of respondents were in favor of dedicated health-safety ratings and reviews. Subsequently, we created a questionnaire that asked individuals to express their priorities as far as health-safety practices adopted in public spaces, and we distributed it using the same methodology. The survey included the following prevention measures: offering environment sanitization (availability of a hand sanitizer and frequent cleaning), enforcing social distancing, requiring a face mask (from both employees and customers), checking the body temperature at the entrance (for both employees and customers), requiring customers and employees to use a social tracking application, and requiring customers and employees to be vaccinated. A total of 514 individuals responded to the survey. Their priorities are indicated in Figure 1.

Furthermore, the survey asked participants to reveal their reaction in response to the health-safety reviews of several businesses that indicated the lack of a specific measure or the presence of a precaution indicated previously. In this case, our data revealed a different priority ranking. Most customers revealed that they would definitely not visit a place or business if employees do not wear any face masks if social distancing rules are not enforced, if there is poor sanitation, and if other customers do not wear PPE. Participants suggested that ratings or reviews, including comments regarding other health-safety practices, would not influence their willingness to visit a public place or business. Furthermore, we collected information about individuals' attitudes towards the pandemic, which enabled us to model three customer personas. A total of 115 respondents (22%) reported that they avoid being outside as much as possible due to the presence of vulnerable individuals in the household and to the uncertainty caused by the lack of information about the consequences of COVID-19. As a result, they indicated that they would use a review platform dedicated to health-safety, despite their opportunities for social interaction are limited. Also, 341 respondents (66%) identified themselves as cautious but trying to maintain their pre-pandemic lifestyle. Many of them already utilized rating and review systems to evalu-

ate the safety of a location before visiting it. A third group consisted of 58 respondents (11%) who were not particularly interested in nor in adopting the application.
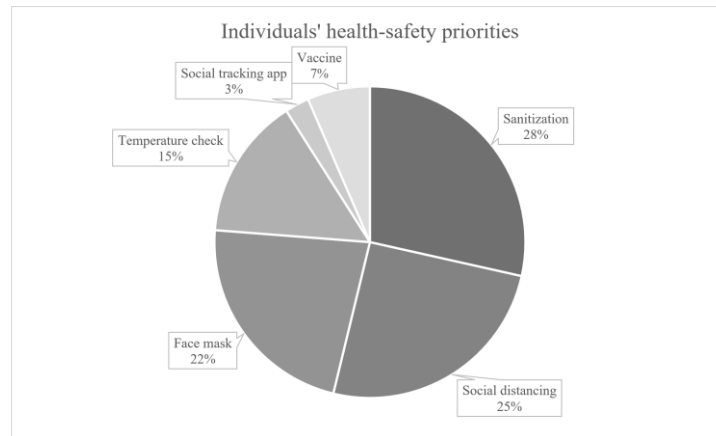

Fig. 1. Respondents indicated environment sanitization, enforcing social distancing, and face mask requirements as their top three priorities, followed by checking the temperature at the entrance, requiring customers and employees to be vaccinated, and installing a social tracking application.

We designed the user interface based on the data from the surveys, highlighting social distancing, the use of face masks (both by employees and customers), and sanitization, are their top priorities for enabling users to decide whether the place is safe. Moreover, the system incorporates a user profile that enables individuals to customize health-safety measures and prioritize them based on their preferences. Figure 2 shows several screenshots of the application, including the review form.

As other review platforms, such as TripAdvisor or Yelp, the proposed solution is vulnerable to paid or misleading reviews containing false information. This can be limited by requiring customers to scan Quick Response code (QR code) placed at the entrance of the venue and register. By doing so, in addition to verifying that the current location of the user matches the address of the business, the application could offer social tracking features.

In addition to providing customers with a dedicated platform for reviewing businesses and, therefore, informing others about the health-safety practices being adopted, the proposed system enables creating a map of COVID-19 practices and user perspectives. Indeed, gathering data about user expectations may enable designing more informative recommendations to customers and address their concerns better. Although the solution is targeted at end customers, rating businesses and adding detailed comments and reviews may help managers and owners understand how they can serve their customers better and improve on specific dimensions of health safety that their audience considers as relevant. By knowing the preferences of their customers, they can adjust their health-safety practices and improve them to match the requirements of their neighborhood or customer base. Moreover, the proposed solution may be benefi-

cial for informing users, suggesting appropriate safety behaviors, and influencing their attitudes in regard to health safety [14].

Although the solution is designed to respond to the current COVID-19 emergency, health-safety practices can be customized to support different preventive strategies that might be required in the case of new types of health crises.

Fig. 2. Screenshots of an early prototype of the User Interface of the application highlighting some of its features, including the personal profile, stores featured for their compliance with health-safety regulations, and nearby restaurants that have been rated and reviewed by other users.

4 User Evaluation

Several prototype iterations were designed using digital tools (e.g., Figma), so we could make changes and immediately evaluate them with end-users. Also, we hosted co-design sessions and shared interactive versions of the mock-ups of the application with individuals, asking them to respond to follow-up questionnaires. The last user evaluation study of the complete user interface was realized before implementing the application. It involved 26 people who interacted with a prototype that incorporated all the features described in this paper. The results of the survey showed that most users found the layout and structure of information easy to navigate and understand, with specific regard to the health-safety rating form, though the colors, style, and layout of the interface were not final. Furthermore, more than 74% of users would be from moderately to extremely comfortable dining at a restaurant that had outstanding reviews with respect to compliance to COVID-19 health-safety measures. This confirms that our solution is appropriate for users who want to maintain a normal lifestyle. Also, it suggests that a dedicated platform for health-safety reviews may increase the willingness to go out in the case of individuals who are experiencing fear of leaving their house.

Furthermore, the survey asked users if they would be likely to switch to a dedicated health-safety review platform in lieu of other applications they currently use to review restaurants. 71% of users expressed their interest, whereas the rest answered against it. Although this response is positive in that it informed us that most users are eager to use the application, further research is needed to investigate the reasons why a minority of users are not interested in using it. For instance, they may feel overwhelmed by the switching cost, though they may use the system in combination with other applications they have already installed. In this regard, the data from our survey is consistent with previous research on users' behavior on other platforms, such as, social media websites [15], and it may suggest the possibility of integrating the features of the proposed system with already-existing solutions. Furthermore, future research will investigate users' behavior in regard to contributing ratings and reviews, rather than consuming information only.

5   Conclusion and Future Work

The COVID-19 emergency revealed the lack of common strategies for fighting global emergencies and, simultaneously, highlighted the need for user-centered solutions that leverage the connected world for increasing awareness, enhancing communication, and supporting positive behavior change [16].

In this paper, we introduced a novel platform for enabling customers to rate and review businesses and public places from a health-safety standpoint. As the work was part of a Human-Computer Interaction coursework, we adopted a design framework especially conceived for realizing user research based on the development of real-world solutions [17].

Indeed, popular applications dedicated to the hospitality and food industry, such as Yelp and TripAdvisor, offer similar features. However, none of the currently available systems for reviewing businesses provide customers with detailed information about the compliance of restaurants, hotels, museums, galleries, and other types of venues with respect to requirements and recommendations that are crucial for ending the COVID-19 pandemic, such as social distancing, use of masks, and sanitation.

We detailed the rationale of our solution and presented a prototype of the application. Furthermore, we discussed the findings of an evaluation study conducted using interactive sketches that demonstrated the features of the application to a group of users in our target audience, including some of which were at risk to COVID-19. Data collected in different development phases using multiple surveys enabled us to gauge the interest of our target user group and adjust the final design. In our future work, we will implement and deploy the application at the following web address (http://www.ush.to/uXXXut), and we will focus on validating our preliminary results with data from user adoption.

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