Voyaging: Crowdsource Application for Safe Travelling Experience

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Abstract. Tourism has always been an important economic sector around the world with millions of tourists travelling every year. With the recent easing of covid restrictions around the world, the tourism industry has been recovering and growing rapidly. While it is a significant contributor to global economy, it is also a source of danger for tourists. Research studies have found that tourists are vulnerable to a variety of dangers and risk, including injury and death, while visiting tourist attractions around the world. Some of the most common causes of tourist fatalities include road traffic accidents, drowning, falls and crimes. It has been found that in a study done in New Zealand, an estimated 20% of overseas visitor injuries and 22% of fatalities are by tourism related activities.

We have developed a mobile application called Voyager is focused to help users be more informed about the dangers and safety culture of their travel destinations. The Voyager aims to help tourists identify safe locations, understand local law and safety culture. By providing this information, the Voyager aims to minimize the risks associated with tourism and enhance the overall travel experience for users.

Keywords: Mobile interaction · Safety mobile app · Human computer interaction

1 Introduction

Tourism has always been an important economic sector around the world with millions of tourists travelling every year. With the recent easing of covid restrictions around the world, the tourism industry has been recovering and resuming its upward climb. In the first quarter of 2022 alone, there has been a 182% increase in international tourists from the previous year, with about 40 million travelers in the first quarter of 2021 to almost 117 million in 2022 [7].

While international tourism is a significant contributor to the global economy, it is also a source of danger for tourists. Foreign travels expose travelers to unfamiliar infectious diseases, as well as dangers brought on by a greater exposure to unfamiliar transportation and leisure activities. The health and safety risks encountered by foreign travelers are substantially different from their original country and can be increased with the lack of traveler familiarity with the new environment. As such, tourists travelling to

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unfamiliar locations are vulnerable to a variety of dangers and risks, including injury and death. Out of millions of tourists travelling globally every year, it is estimated that 30% to 50% are either injured or become ill while overseas. [9] Some of the most common causes of tourist injuries and fatalities include road traffic accidents, drowning, falls, and crimes [1]. According to a study done in New Zealand, an estimated 20% of overseas visitor injuries and 22% of fatalities are caused by tourism-related activities (Reid, 2017). As the tourism industry recovers, the number of incidents resulting in tourist injuries and fatalities will likely increase.

Tourist safety has been tackled by many existing applications, such as the Emergency App by the US Red Cross and Smart Traveller by the US State Department. The scope of these existing apps covers a limited geographical scope and only encompasses a specific functionality that does not provide for all the needs of a general traveler. In contrast, this study selected all the useful components of existing solutions and combined them into a one-stop tourist safety application.

This study advances beyond previous solutions by implementing a new platform for travelers to obtain safe travel information. A mobile application called Voyager is developed to help users be more informed about the dangers and safety culture of their travel destinations. The objective of the app is to help tourists identify locations that are reviewed as safe by other tourists, understand local laws, and culture, and allow for user to choose recommended travel locations so that travelers can minimize the risks associated with tourism and have a better travel experience.

2 Background and Related Works

Given the significance of the problem when it comes to tourist safety, there exist several existing solutions in the market. In this section, existing solutions that aim to tackle or enhance travelers' safety experience in an unfamiliar environment will be reviewed. Specifically, the review will be divided into two areas, namely (a) research into the impact and awareness of tourist safety and (b) the features and functionalities of relevant and popular traveler's safety mobile application. The section ends with a reiteration of the objectives behind the investigation.

2.1 Related Research

The concept of implementing a technology solution for an existing problem is not new, many studies such as technology acceptance modal (TAM) [10] and the information system success modal (ISSM) [11] have been done to identify the key factors that would enable new technology to benefit the users. It has been found that information quality factor is the most important dimension of technology and that it affects user satisfaction the most, with the second most important dimension being system quality [12–14]. Crucial information that is to be presented to the user for their safety should be verifiable or managed by government bodies to ensure that they are unmodified. In recent years, multiple government initiatives around the world have provided east access to open government data that could allow for innovation using credible data [15].

The use of data and technology has brought many opportunities to the tourism industry. Much research has also been done to examine the impacts of smart tourism technology, with multiple sources identifying that accessibility of information, ease of use, and perceived benefits to be positively correlated to travel experience satisfaction [16, 17, 19]. Smart tourism apps that are implemented effectively have been known to significantly reduce safety risks and augment the perceived safety of the users [18]. Smart tourism technology has shown its effectiveness when implemented with proven modals [18, 20]. The implementation of Voyager aims to reduce safety risks of the general traveler in a new environment through accessible and quality data.

2.2 Related Applications

Within the United States of America, there are two mobile applications that are released by the government or state bodies that aim to provide travel safety information to US travelers. They are the Smart Traveler by the US Department of State and the Emergency App by the American Red Cross. Other popular apps used by users around the world include GeoSure, the travel location ratings app, and Trip Lingo which help travelers overcome language and cultural barriers overseas. The Table 1 provides information on existing applications with features aimed to provide more awareness of tourist safety have been compiled to identify features that incorporated in the Voyager mobile application.

Smart Traveler is a mobile application developed to help US citizens traveling abroad stay safe by providing up-to-date travel advisories and warnings for countries around the world, as well as information on the local laws, customs, and visa requirements of the destinations [3]. Emergency App is a mobile application designed to provide users with a range of tools and resources for emergency responses. The app includes features such as real-time weather alerts, information on American Red Cross shelters, and instructions for first aid and CPR procedures. The application is mainly made to be a comprehensive resource for travelers to prepare for and respond to emergency situations within the United States of America [4]. GeoSure is developed to provide user-reviewed safety and security ratings for over 200 countries and territories around the world, which are based on a range of factors such as crime rates, political stability, and environmental hazards [5]. Trip Lingo is mainly used by travelers to overcome language hurdles when it comes to communicating with the locals. The application provides a voice translator, a phrasebook with phrases for a variety of situations, and a cultural guide on local etiquette [6].

Despite the number of existing popular applications that aim to tackle the problem of tourist safety, each of them provides a feature that focuses on one component that a general traveler needs while travelling. The Smart Traveler and Emergency App are useful applications when it comes to travelling to new environments, however their services are mainly catered to use within the United States with most of the solutions being limited to the general American citizens. As for the GeoSure, it provides an innovative social solution that allows users to have an informed travel plan, the application lacks information on safety risks and guides upon reaching the location. Lastly, Trip lingo is mainly a communication application and does not provide much safety information.So far, there has been a considerable amount of research and solution provided worldwide to combat the issue of tourist safety, however, more could have been done to allow for

Table 1. Comparison on different mobile applications

	Smart Traveler [3]	Emergency App [4]	Geo Sure [5]	Trip Lingo [6]	Voyager
Weather Information		✓			✓
Location Review			✓		✓
Map		✓	✓		✓
Local Emergency Contact		✓		✓	✓
Location Safety Rating			✓		✓
Travel Warning & Alerts	✓	✓			✓
Map of shelters		✓			
Medical phrases in different language				✓	✓
Local Do's and Don'ts, Culture Notes				✓	✓
Local Law	✓				✓
Entry, Exit & Visa Requirements	✓				✓
Emergency Responses		✓			✓

a more convenient way to access all the useful safety information for travelers who are on foreign lands. Therefore, the Voyager application in this paper aimed to provide an all-in-one platform with relevant features from existing applications for the user to effectively plan for their travels and be informed of the local laws and safety responses to minimize the risk associated with tourism.

3 Design and Implementation

3.1 System Overview

The information displayed on Voyager must be up-to-date and accurate. With information quality in mind [12], the data and information utilized for Voyager are mostly through public APIs that from government data platforms or organizations that specialized in

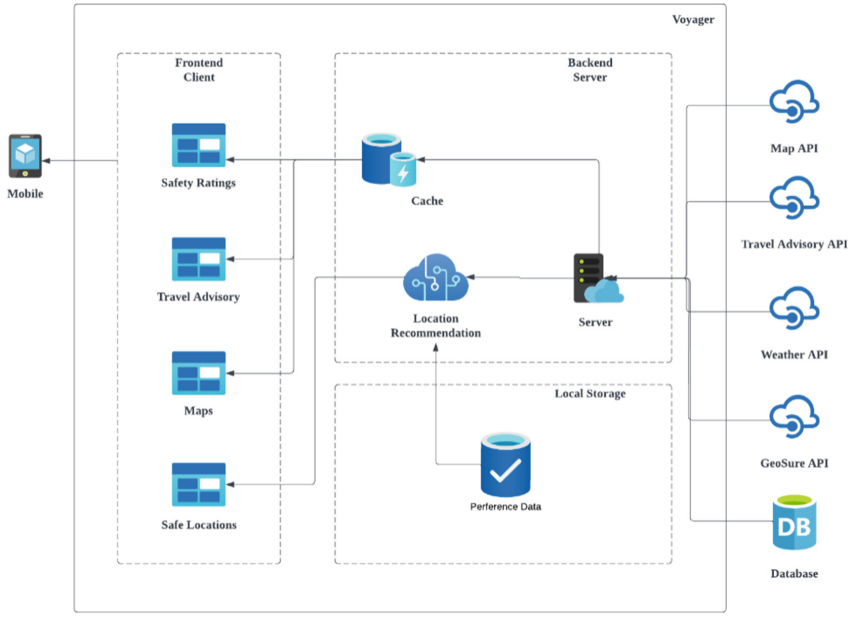

Fig. 1. System Overview

the data we require [15]. Voyager utilizes attraction recommendation algorithm that are based on user's preference data and location to recommend attractions in the user interface. In addition, Voyager acts as a social platform for users to provide additional feedback or insights into the information presented (Fig. 1).

3.2 Features of Voyager

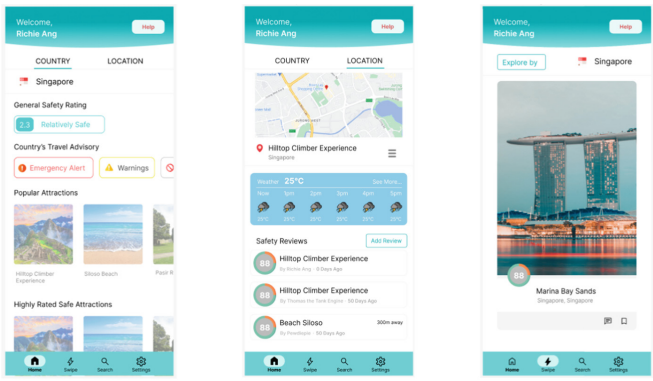

Fig. 2. User Interface for Main Features

Voyager is designed to provide features and functionality for the user who is planning to travel and users who are already at their destinations to be informed about the location safety risks, travel information, and emergency responses. The Fig. 2 shows the user interfaces for browsing through recommended safe and popular locations that are personalized for the current user. When the user first logged in to the app, they will be presented with the safety rating, travel alerts, warnings, and the recommended attractions for the user based on their location and preferences.

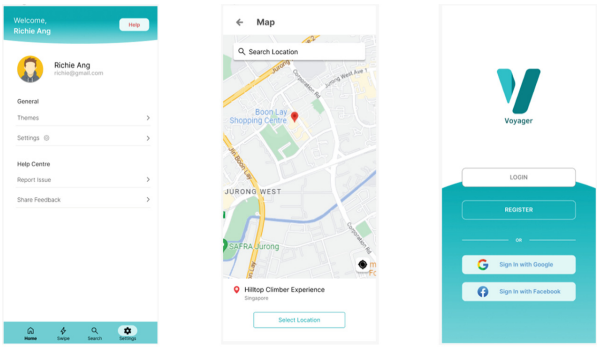

Fig. 3. User Interface for Authentication

The Fig. 3 shows the settings page and the login page for the Voyager application. The app includes a page to allow user to search for the location safety information. On every main page, there are built-in responses for a variety of situations, and emergency contacts based on the user's current location and country of origin.

4 Conclusion and Future Work

In this paper, the mobile application called Voyager is presented, it is a novel system that uses preference data to provide safe and popular tourist attractions recommendations. The app also allows users to access relevant safety information and emergency responses for their current location. Unlike other solution that provides a focused safety solution, Voyager provides all the effective component of existing applications into one consolidated platform and is adaptive to the user's location and preferences. There are a few information whereby public APIs does not provide and will be researched upon to enhance the experience for user.

In future work, we plan to improve the user experience of the Voyager client, which is an important factor during emergencies. Since majority of the safety information derives from multiple public APIs, we intend to enhance the system by eliminating such dependencies as much as possible. On top of that, the safety rating on tourist attractions and locations can be further analyzed to identify consistently hazardous locations for user to avoid.

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