Consumers' Use of Smartphone Technology for Travel and Tourism in a COVID Era: A Scoping Review

Gary Myers\textsuperscript{1}, Janice Scarinci\textsuperscript{2}

Abstract

Mobile phone technology has become a necessary component for today's travellers. Information and communication technologies (ICTs) have substantially affected tourism and hospitality consumers over the past two decades. Mobile technologies such as smartphones, tablets, and mobile applications have become travellers' primary access to information. This study focuses on mobile technologies such as smartphones and mobile applications (apps) and consumers' use of mobile technology when travelling. A scoping review following PRISMA guidelines was used to answer the research question: "How do tourism consumers use mobile technologies for travel and tourism during the COVID era?" This study will identify and analyse any relationships, patterns, trends, and gaps in the literature. Peer-reviewed journal articles from the COVID era (2020 to 2022) were included in this study. Articles were sourced using the keywords listed below. The full articles were imported into NVivo, and the main themes and subthemes were extracted from the data and reported using an inductive qualitative thematic analysis. The results from this study identified "food" as the main theme and "food delivery" as the most frequent subtheme. Food, tourism, transportation, Fourth Industrial Revolution (4IR), Hotel Operations, and Shopping were the top 6 themes. The 4IR is changing how smartphone consumers use their devices for travel and tourism. In the COVID Era, Smartphone technology has been recognised as a solution to maintaining safe distancing and contactless transactions. This research will benefit tourism operators and policymakers to remain competitive in an ever-changing environment during the COVID era.

Keywords: Smartphone, Mobile Phone, Apps, Tourism, Travel, COVID-19

\textsuperscript{1} Corresponding author, College of Business, Law, and Governance, James Cook University, Australia, email: gary.myers@my.jcu.edu.au
\textsuperscript{2} College of Business, Law, and Governance, James Cook University, Australia, janice.scarinci@jcu.edu.au

Journal of Resilient Economies (JRE) publishes original research with a multidisciplinary focus to further advance the important concept of resilience. JRE is fully supported by James Cook University Open Journal Systems (OJS), driven by the belief that knowledge has the power to change lives, and that research outputs should be freely accessible online, without barriers. To cite, include Author(s), Title, Journal of Resilient Economies, volume, issue, year and DOI. DOI: https://doi.org/10.25120/jre.2.1.2022.3923
1. Introduction

There has been a significant increase in the number of smartphone users since the COVID era began in 2020. Statista (2022) states that there were four billion, sixty-six million (4,066.29 million) smartphone users worldwide in 2019, before the COVID era. In 2022, this number rose by over 897 million users to four billion, nine hundred and sixty-three million (4,963.92 million) smartphone users worldwide. They are projecting this number to increase to over 5.5 billion users by 2025. Dickinson et al. (2014) argued that the smartphone had become a major tourism travel tool due to the rapidly growing number of smartphone users and the emerging variety of smartphone apps. Chang and Shen (2018) confirm that smartphones are emerging as a travel tool due to the variety of functions and advanced mobile technologies. Yu, Anaya, Miao, Lehto and Wong (2018) supported this argument when they stated that scholars had developed a growing interest in the influence of smartphones on the tourist experience in recent years. According to Law et al. (2018), there has been a significant increase in the number of studies on mobile technology over the past five years, from 2012 to 2017. The authors argue that this indicates the importance of this topic to tourism and hospitality scholars, consumers, and suppliers.

This study aims to extend the current knowledge of travel consumers' use of smartphone technology to include the COVID era (2020-2022). This information will benefit tourism operators utilising mobile technologies to gain a competitive advantage. The data collected will benefit tourism operators, policymakers, and researchers. The key research question in this study is: How do tourism consumers use mobile technologies for travel and tourism during a COVID era?

Background Information Smartphone Usage Before COVID era

Law et al. (2018) conducted a comprehensive literature review on mobile technology articles published in the tourism and hospitality journals prior to 2018. They collected all the mobile-technology articles that were specifically about hospitality and tourism from four databases, EBSCO host, Google Scholar, Science Direct, and Scopus, from September to November of 2017. They used several keywords such as "mobile technology," "mobile service," "mobile device," "mobile applications," "apps," and "smartphone." Only the articles that were published in hospitality and tourism journals were included in the study. They identified 92 articles published between 2002 and 2017. The articles were divided into two main categories: supplier-focused, which included 25 papers, and consumer-focused, with 67 peer-reviewed papers. Their main findings that pertain to this study included the impact mobile technologies have on consumer travel patterns and behaviours.

Law et al. (2018) argue that the consumer's perspective of mobile technologies on travel patterns and behaviour has been studied much less, with only 17 out of 92 articles covering this topic. This indicates a gap in the literature and an area that can be explored further. The main findings from their research indicate that mobile technologies change the way consumers plan their trips, experience their trips, and consume their trips. It also discusses the post-trip sharing and feedback stages. The research identified four main stages that the consumer goes through, including the pre-trip planning stage, where the consumer primarily relies on tablets and smartphones (Murphy, Chen, & Cossutta, 2016); (Wang, Xiang, & Fesenmaier, 2014). The next stage is the during-trip experience stage, where the consumer has control through their mobile devices to adjust their itinerary (Lamsfus, Wang, Alzua-Sorzabal, & Xiang, 2014), (Wang, Park, & Fesenmaier, 2012), (Wang, Xiang, & Fesenmaier, 2016). The final stage is the post-trip sharing stage. The tourist is more likely to share their experience in real-time as they are experiencing the service instead of waiting to get home and give feedback. They generally use their social media on their mobile devices to share their experiences. Mobile devices also make it much easier for tourists to store and retrieve photos and memories.

170
lack of data access. For example, more than half of the non-WiFi data access respondents used their phones to look up maps and find restaurants and shops. Over 60% of the users used their phones for transportation and social media. Also, three times the number of respondents with non-WiFi access used their phones to look up tourist information and twice as many used their phones for translations. Visitors who use their phones more at home as part of their everyday behaviour had a higher usage while travelling. These findings also support Wang et al. (2016) regarding the spillover effect of smartphone users having more usage when they travel. Tanti and Buhalis (2017) had similar results indicating that social WiFi and available infrastructure increase the use of technology while travelling.

Vallespin, and Molinillo (2017) conducted a study to explore the predictors of smartphone use for travel planning. They used an online survey of 618 Spanish travellers. They used a hierarchical segmentation analysis using social-demographic variables such as age, education, occupation, marital status and income and behavioural variables such as several trips annually and length of smartphone use. Their findings support the previous studies from (Wang, Xiang, & Fesenmaier, 2016) and (Mang, Piper, & Brown, 2016) that the spillover effect can be identified by the smartphone users' daily use and the amount of travel planning with their smartphone. The higher daily smartphone usage is directly correlated to the amount of smartphone usage while travelling.

In a similar study conducted by Kang, Jodice, and Norman (2020), they studied how tourists' used their smartphones before and during a trip. They conducted an online survey by email to visitors that travelled to South Carolina in October 2014. They had 357 responses and were able to use 288 respondents (80.7%), where the respondent answered that they used smartphones for information searches during their trip to the Carolinas. They found that age was significantly associated with the use of a smartphone while travelling. These results were supported by Tussyadiah's (2016) findings that smartphone usage during travel is greater with younger, educated females with a higher income.

Applications (apps)
Smartphone apps have provided extensive opportunities for smartphone usage during travel. According to Lu, Mao, Wang and Hu (2015), smartphones and applications greatly impact tourist behaviour. Gupta and Dogra (2017) conducted a study on the use of mapping applications (apps) on smartphone usage in India from August to November of 2016. They gained access to Indian travellers from travel agents in India and sent an email with a description of the mapping applications and a survey link. Of the 757 email invitations, 349 surveys were returned, and 284 respondents had used location-based travel applications, representing a 37.5% response rate. It was reported that those respondents over the age of 50 had not used the mapping technology and were not included in the study. The findings indicated that the largest proportion of respondents was between the ages of 20-30 years (44.7%) and 30-40 years (34.5%) and 40 – 50 years (14.7%), and the lowest demographic was below 20 (6.33%). The key results of this study indicated that the users' habit was the strongest factor affecting the user's use of smartphone mapping apps while travelling.

A study was conducted by Gupta, Dogra, and George (2018) to identify the factors that affect tourists' intentions to use travel apps on their smartphones. They surveyed 389 participants and used 343 completed surveys. The findings supported Lu, Mao, Wang and Hu's (2015) findings that the user's behaviour was predominantly usage intention, except in the case of habits. The consumer's use of smartphone apps was affected by price-saving, orientation, performance expectancy, social influence, perceived risk, trust, and habit. The results of these studies can have implications for the smartphone and app developers to consider the user's intentions when using their app or smartphone while travelling to enhance the travel experience.

The traveller's experience
Kirova and Thanh (2019) stated that many studies have indicated smartphones are increasing the travellers' experience. They studied theme park visitors, their smartphone use, and their experience visiting a theme park. They used multiple qualitative research methods, including semi-structured interviews, ethnographic approaches, and experience narratives. They sampled 213 participants by answering an online questionnaire. The results were consistent with previous studies by Dickinson et al. (2014) and Tussyadiah (2016), showing that smartphone usage was primarily for utilitarian reasons during travel and Mang et al. (2016) found that they were mostly used for social reasons and to share the travel experience with others. Kirova and Thanh (2019) show that smartphones in theme parks were used for relational reasons for interactions with their friends and family. They also indicated that using smartphones enhanced the customer experience at theme parks, for it decreased the anxiety during long waits in lines and was used predominantly during downtime. Tussyadiah and Wang (2016) conducted a study to investigate the reasons why tourists recommend smartphones while travelling. The findings concluded that most participants used their smartphone as a companion or guide, which made their travel more enjoyable and enhanced their travel experience.

Conclusions of Research Before COVID-19 & Rationale for Current Research:

Before the COVID era, many studies were conducted around the world on smartphone user behaviours in travel in the United States (Kang, Jodice, & Norman, 2020), (Wang, Xiang, & Fesenmaier, 2016), India (Lu, Mao, Wang, & Hu, 2015) Spain (Vallespin & Molinillo, 2017) and in Europe (Mang, Piper, & Brown, 2016) The findings of these studies were consistent around the world. The findings from Wang et al. (2016) identified six reasons consistent across the literature as to why tourists use smartphone technology while travelling. These include the following:

1. Communication
2. Social Activity
3. Information acquisition
4. Information searches
5. Entertainment
6. Facilitation
The primary aim of this study is to determine how tourism consumers use mobile technologies for travel and tourism during the COVID era. This study analysed peer-reviewed scholarly articles that were published during the COVID era (2020-2022). The results were compared to the previous research findings to identify any changes or new themes that emerged during the COVID era.

2. Methodology

A scoping review of the literature was conducted for this study to identify and analyse any relationships, patterns, trends, and gaps that exist in the literature. The research team met multiple times to clarify and define the problem statement based on the previous literature and the inclusion and exclusion of the sources for the scoping review. The researchers developed a structure for the data collection and analysis of data using the Arksey and O'Malley Framework (2005), the Joanna Briggs Institute (JBI) JBI Manual for Evidence Synthesis and the PRISMA-ScR checklist and flowchart (Tricco, 2018).

Based on Arksey and O'Malley's Framework, this study included the following five stages: (1) Identifying the research question, (2) Identifying relevant studies, (3) Study selection, (4) Charting the data, (5) Collating, summarising, and reporting the results.

Stage 1: Identifying the Research Question:

The broad research question guided the Scoping Review, "How do tourism consumers use mobile technologies for travel and tourism during a COVID era?"

Stage 2: Identifying Relevant Studies:

This paper reviewed studies published in peer-reviewed journals from the period of 2020 to 2022. After searching the databases for other scoping reviews, the researchers reviewed Law et al. (2018) "A comprehensive review of mobile technology use in hospitality and tourism". Law's scoping review included data from 2002 – 2017. Therefore, this study further develops the work of Law et al. (2018) on the current knowledge on tourism consumers’ use of mobile technologies for travel and tourism from 2000 to 2022. Finally, this time frame was chosen due to rapid advancements in technology and to ensure the literature was relevant to the COVID era.

After initial searches were completed, snowballing and backward snowballing were used to expand the source material being reviewed to ensure a sufficient number of quality references were included in the literature review. The additional sources were used to establish the need and background information on consumer usage before COVID to compare the differences during the COVID era and identify any relationships, patterns, trends, and gaps in the literature.

Stage 3: Study Selection:

Studies were sourced using the keywords smartphone, mobile phone, apps, tourism, tourist, travel and Covid. The searches were conducted during February and March of 2022 using the databases that were available to the researchers, including Emerald Insight, ProQuest platform, ScienceDirect, Scopus, and Google Scholar. We searched google scholar to ensure comprehensive coverage of the published academic research. By using the Boolean operators of "AND" and "OR" searches were refined to results specific to smartphone technology used by travellers/tourists (e.g. "smartphone" OR "mobile phone" OR "cell phone").

After consultation with three research librarians and extensive trial variations of the Boolean operators in all the databases listed above. The researchers agreed on the final search string criteria as follows:

AND
(airport OR "mobile phone") AND
(tourism OR travel) AND
(Tourist OR traveller) AND
("Mobile apps" OR "travel apps")
AND (Covid OR Coronavirus OR “Covid-19”)

The searches of the five databases resulted in 252 peer-reviewed articles on March 10, 2022. We exported the documents into Endnote and deleted the 25 duplicate records leaving a total sample of 227 articles to review. The researchers independently reviewed the titles and the abstracts of the 227 documents to determine if they were eligible to be included in the study based on the Industry, user, and purpose. One hundred and thirty-eight articles were excluded from the study leaving 89 full documents to be retrieved. Fifty-two peer-reviewed articles were not accessible, leaving 37 full reports to review for eligibility. Please refer to Figure 1: PRISMA 2020 flow diagram for the details.

The research team developed inclusion and exclusion criteria based on a specific research question at the outset of the project. The inclusion criteria used in this study included: Type of User (e.g. travel consumer); Purpose of Use (e.g. Smartphones); Relevant Industry (e.g. tourism industry). The researchers applied the inclusion and exclusion criteria to the 37 articles. Using the inclusion and exclusion criteria and the guiding research question, "How do tourism consumers use mobile technologies for travel and tourism during a COVID era?". The following were the exclusion reasons (Figure 1).

Reason 1: Does not relate to the type of user (tourist or travel consumers)
Reason 2: Not related to the purpose of use of a smartphone, mobile phone or cell phone
Reason 3: Not related to Relevant Industry in travel and tourism

Table 1 provides information regarding inclusion and exclusion criteria for the scoping review. Eight articles were excluded due to the Type of User, five were excluded due to the Purpose of Use, and two were excluded due to the non-relevant Industry, leaving 22 studies to be included in the scoping review, as shown in Figure 1.

Once the comprehensive list of articles was identified, the full articles were acquired for review. After the initial searches and evaluation process was completed, the practice of snowballing and backward snowballing was used to expand the source material being reviewed (Wee & Banister, 2016).
Identification of studies via databases and registers

Table 1- Inclusion and exclusion criteria for scoping review

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Inclusion Criteria</th>
<th>Exclusion Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publication Type</td>
<td>Articles in peer-reviewed academic journals that the researchers have access to.</td>
<td>All other publication venues, including grey literature, book chapters, books, and conference presentations</td>
</tr>
<tr>
<td>Dates of Studies</td>
<td>2018-2022</td>
<td>Anything before 2018, unless it is identified as important during the snowballing process. Any articles that were in-press were excluded.</td>
</tr>
<tr>
<td>Language</td>
<td>English language only</td>
<td>Any references that are not published in English</td>
</tr>
<tr>
<td>Type of User</td>
<td>Tourist or travel consumer</td>
<td>Any articles that are not reporting the tourist or travel consumer</td>
</tr>
<tr>
<td>Purpose of Use</td>
<td>Purpose of use of Smartphones</td>
<td>Any articles that do not relate to the use of smartphones (mobile phones or cell phones) in travel or tourism</td>
</tr>
<tr>
<td>Relevant Industry</td>
<td>Travel and Tourism Industry</td>
<td>Any articles that do not pertain to the Travel and Tourism Industry</td>
</tr>
</tbody>
</table>
Stage 4: Charting the Data:

The next stage of the research method included charting the data for key issues and themes from the articles. The first round of coding included developing an excel spreadsheet (codebook) to extrapolate general information about the study and specific information such as Author, year, title, and relevant industry themes. This data assisted the researchers in answering the research question, "How do tourism consumers use their mobile technology for travel and tourism during the COVID era?" The researchers coded and mapped the key issues and themes from the current articles, compared the findings with the pre-COVID data, and mapped the trends, patterns and relationships between the pre-COVID and COVID eras.

Stage 5: Collating, summarising, and reporting the results:

Endnote was used to collate, store, and screen all the references. When the first round of coding was complete, the full articles were imported into NVivo, and the Key Themes and Issues were extracted from the data and reported using an inductive qualitative thematic analysis. A thematic construction and analysis were conducted to present a narrative of the themes and key findings from the literature. The quantity and frequency of the key themes and outcomes identified were collated, summarised, and reported. NVIVO was used to collate them and identify the quantity and frequency of the key themes.

The researchers used several techniques in NVIVO to increase the confidence of the thematic analysis. First, we conducted a text search using the key search terms from the initial searches, then a word frequency search to determine the most frequently occurring key terms. Second, we conducted a "word frequency" search to identify the top words most frequently occurring words from all the sources. We used an "exact match" search and a minimum word length of three characters to ensure the keyword "app" was included. Third, we identified subthemes by investigating keywords and phrases that would fall under the key themes. Fourth, we created word clouds of our themes and subthemes. Finally, a comparative analysis of the themes from the pre-COVID literature and the COVID era was conducted. The results and discussion section will provide the results of the methods that were used.

3. Results and Discussion:

The researchers combined related main themes such as tourism and travel, transportation and airline, the Fourth Industrial Revolution (4IR) and the Internet of Things (IoT). The number of articles mentioned in the table below equals 24 because two articles mentioned dual themes. Please see Table 3 for the Main Themes and Subthemes that emerged from the articles.

There were six main themes, with food being the most common main theme in seven articles representing 31.8% of the literature. An additional 22 sub-themes were originally identified. The researchers combined the related subthemes for a total of eight subthemes. Since several themes and subthemes were identified in multiple articles, the total number of articles was greater than the sample size (n = 22 articles). Table 4 shows the rank order of subthemes from the most frequent to least frequent subthemes.

The most frequently occurring main theme and subtheme involved food and food delivery. This could be due to the spread of COVID-19 and lockdowns requiring people to order food to be delivered and using contactless delivery methods to decrease the spread of COVID. Therefore, one of the main trends during the COVID era was identified as food delivery. This could also be tied to a new trend in contactless delivery due to COVID. However, this study searched for the consumer's use of smartphones, not the motivation for using a smartphone. Therefore, further research is recommended to identify the motivation for smartphone usage during the COVID era.

The researchers used several techniques in NVIVO to increase the confidence of the thematic analysis. To ensure that the selected articles met the search criteria, a text search using the key search terms from the initial keywords used to acquire relevant literature. The researchers ran a word frequency search on the keywords. Please refer to Figure 2 for the most commonly occurring keywords in the 22 articles. Mobile and tourism were the most frequently occurring words with travel, COVID and Apps and smartphone to follow. This test confirmed that the articles met the search criteria that were designated.

Second, authors conducted a "word frequency" search to identify the top 50 most frequently occurring words from all the sources. We used an "exact match" and a minimum word length of three characters. The thematic analysis was based on the guiding research question "How do tourism consumers use mobile technologies for travel and tourism during a COVID era?" To answer this question, the researchers ran a word frequency using NVivo 12 Plus and the following Word Cloud shows the results. Figure 3 shows the results of the Word Frequency Word Cloud.
### Table 2: Scoping Review Articles and Relevant Industry Themes and Subthemes

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Title</th>
<th>Relevant Industry Themes/subthemes</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Chan, Gao, &amp; McGinley)</td>
<td>2021</td>
<td>Updates in service standards in hotels: how COVID-19 changed operations</td>
<td>Hotel Operations Service standards Crisis management</td>
</tr>
<tr>
<td>(Garcia-Milón, Olarte-Pascual, Juadena-Ayensa, &amp; Pelegrín-Borondo)</td>
<td>2021</td>
<td>Tourist purchases in a destination: what leads them to seek information from digital sources?</td>
<td>Shopping Digital Information</td>
</tr>
<tr>
<td>(Kaur, Dhir, Talwar, &amp; Ghuman)</td>
<td>2020</td>
<td>The value proposition of food delivery apps from the perspective of theory of consumption value</td>
<td>Food, Food Delivery Applications (FDA) Airline Crisis Management and Resilience</td>
</tr>
<tr>
<td>(Suk &amp; Kim)</td>
<td>2021</td>
<td>COVID-19 and the airline industry: crisis management and resilience</td>
<td>Crisis Management and Resilience</td>
</tr>
<tr>
<td>(Samoggia, Monticone, &amp; Bertazzoli)</td>
<td>2021</td>
<td>Innovative Digital Technologies for Purchasing and Consumption in Urban and Regional Agro-Food Systems: A Systematic Review</td>
<td>Food, Food delivery</td>
</tr>
<tr>
<td>(Abdallah, Nazam, Hussain Shah, Muhammad Ashraf, &amp; Canpisi)</td>
<td>2021</td>
<td>Service Quality Assessment of App-Based Demand-Responsive Public Transit Services in Lahore, Pakistan</td>
<td>Transportation, Demand-Responsive Transit (DRT)</td>
</tr>
<tr>
<td>(Aguir-Castillo, Rufo, &amp; Rabadan)</td>
<td>2021</td>
<td>Survey on Optical Wireless Communications-Based Services Applied to the Tourism Industry: Potentials and Challenges</td>
<td>Tourism, Communication, Smart Tourist Destinations (STD)</td>
</tr>
<tr>
<td>(Belanche, Flavían, &amp; Pérez-Rueda)</td>
<td>2020</td>
<td>Mobile Apps Use and WOM in the Food Delivery Sector: The Role of Planned Behavior, Perceived Security and Customer Lifestyle Compatibility</td>
<td>Food, Mobile Apps, Food Delivery</td>
</tr>
<tr>
<td>(Bellini, Nesi, &amp; Pantaleo)</td>
<td>2022</td>
<td>IoT-Enabled Smart Cities: A Review of Concepts, Frameworks and Key Technologies</td>
<td>Internet of Things (IoT), Smart city</td>
</tr>
<tr>
<td>(Chung, Huang, Weng, &amp; Lin)</td>
<td>2022</td>
<td>The Sustainable Innovation Design in Catering Service</td>
<td>Food, Service Quality</td>
</tr>
<tr>
<td>(Drljača, Štimac, Bračić, &amp; Suša)</td>
<td>2020</td>
<td>The Role and Influence of Industry 4.0. in Airport Operations in the Context of COVID-19</td>
<td>Airlines, Fourth Industrial Revolution (4IR)</td>
</tr>
<tr>
<td>(Hwang &amp; Kim)</td>
<td>2021</td>
<td>The Effects of Expected Benefits on Image, Desire, and Behavioral Intentions in the Field of Drone Food Delivery Services after the Outbreak of COVID-19</td>
<td>Food, Drone Food delivery</td>
</tr>
<tr>
<td>(Lee, William Cannon, &amp; Chung)</td>
<td>2020</td>
<td>Smart Tourism City: Developments and Transformations</td>
<td>Fourth Industrial Revolution, Smart Tourism City</td>
</tr>
<tr>
<td>(Macías-Rendón, Rodríguez-Morales, &amp; Barriga-Medina)</td>
<td>2021</td>
<td>COVID-19 lockdown and the satisfaction with online food delivery providers</td>
<td>Food, Online Food Delivery</td>
</tr>
<tr>
<td>(MacSween &amp; Canziani)</td>
<td>2021</td>
<td>Travel booking intentions and information searching during COVID-19</td>
<td>Travel, Information</td>
</tr>
<tr>
<td>(Sajinčič &amp; Starman)</td>
<td>2021</td>
<td>Use of Smartphone Cameras and Other Applications While Traveling to Sustain Outdoor Cultural Heritage</td>
<td>Travel, Smart Phone Apps</td>
</tr>
<tr>
<td>(Sarker, Hoque, Uddin Md, &amp; Tawfeeq)</td>
<td>2021</td>
<td>Mobile Data Science and Intelligent Apps: Concepts, AI-Based Modeling and Research Directions</td>
<td>Internet of Things, Intelligence Apps</td>
</tr>
<tr>
<td>(Shamim, Awais Ali, Muhammad Ahsan, Rafique, &amp; Akhunzada)</td>
<td>2021</td>
<td>Ride or Not to Ride: Does the Customer Deviate toward Ridesharing?</td>
<td>Transportation, Demand Responsive Transit (DRT)</td>
</tr>
<tr>
<td>(Surya, Sukresna, &amp; Mardiyono)</td>
<td>2021</td>
<td>Factors Affecting Intention To Use Food Order-Delivery Feature Of Ride-Hailing Applications: The Utaut Approach</td>
<td>Food, Food Delivery</td>
</tr>
<tr>
<td>(Karopoulos, Hernandez-Ramos, Kouliaridis, &amp; Kambourakis)</td>
<td>2021</td>
<td>A Survey on Digital Certificates Approaches for the COVID-19 Pandemic</td>
<td>Travel, Digital Certificates Smartphone Apps</td>
</tr>
<tr>
<td>(Raza, Hamid, &amp; Cavaliere)</td>
<td>2021</td>
<td>The e-tourism beyond covid-19: A call for technological transformation</td>
<td>E-tourism, Technological Transformation</td>
</tr>
<tr>
<td>(Sun, Liu, &amp; Zhang)</td>
<td>2021</td>
<td>Mobile Technology and Studies on Transport Behavior: A Literature Analysis, Integrated Research Model, and Future Research Agenda</td>
<td>Tourism, Transport</td>
</tr>
</tbody>
</table>

*Note: Only the Main Themes are colour coded. Sub-themes are in black*
### Table 3: Main Themes and Subthemes

<table>
<thead>
<tr>
<th>Main Themes</th>
<th># of Articles for Main Themes</th>
<th>% of Total Articles for Main Themes</th>
<th>Subthemes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food</td>
<td>7</td>
<td>31.8%</td>
<td>Food Delivery Applications</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Online Food Delivery</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Drone Food Delivery</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Service Quality</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mobile Apps</td>
</tr>
<tr>
<td>Tourism, Travel and E-Tourism</td>
<td>6</td>
<td>27.3%</td>
<td>Communication</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Information</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Smart Tourist Destination</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Smart Phone Apps</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Digital Certificates</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Transport</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Technological transformation</td>
</tr>
<tr>
<td>Transportation and Airline</td>
<td>5</td>
<td>22.7%</td>
<td>Demand Responsive Transit</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Crisis Management and Resilience</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fourth Industrial Revolution</td>
</tr>
<tr>
<td>Fourth Industrial Revolution</td>
<td>4</td>
<td>18.2%</td>
<td>Smart City</td>
</tr>
<tr>
<td>and Internet of Things (IoT)</td>
<td></td>
<td></td>
<td>Smart Tourism City</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Intelligent Apps</td>
</tr>
<tr>
<td>Hotel Operations</td>
<td>1</td>
<td>.05%</td>
<td>Service Standards</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Crisis Management</td>
</tr>
<tr>
<td>Shopping</td>
<td>1</td>
<td>.05%</td>
<td>Digital Information</td>
</tr>
</tbody>
</table>

**NOTE:** The total number of articles for main themes is 24 because 2 articles mentioned multiple themes.

### Table 4: Rank Order of Subthemes from Most Frequent to Least Frequent

<table>
<thead>
<tr>
<th>Rank Order</th>
<th>Subthemes Titles</th>
<th>Combined Related Subthemes</th>
<th>Total # of Articles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Food Delivery</td>
<td>Food Delivery Applications (FDA) (1)</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Food Delivery (3)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Online Food Delivery (1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Drone Food Delivery (1)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Information</td>
<td>Information (1)</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Communication (1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Digital Information (1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Technological transformation (1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fourth Industrial Revolution (1)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Mobile Apps</td>
<td>Mobile Apps (1)</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Smartphone apps (2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intelligent Apps (1)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Transportation</td>
<td>Demand Responsive Transit (2)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Transport (1)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Smart Tourism Destination</td>
<td>Smart City (1)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Smart Tourist Destination (1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Smart Tourism City (1)</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Crisis Management</td>
<td>Crisis Management (1)</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Crisis Management and Resilience (1)</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Service</td>
<td>Service Quality (1)</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Service Standard (1)</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Digital Certificates</td>
<td>Digital Certificate (1)</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>Eight subthemes</td>
<td>22 subthemes combined</td>
<td>26</td>
</tr>
</tbody>
</table>
Food, mobile, and information were the most frequently occurring themes in the word cloud in NVivo. Out of 22 articles, the most frequently used term was food, and the top three subthemes were food delivery, information, and mobile Apps. This is consistent with the researcher’s findings of the initial coding of themes and subthemes identified in Tables 3 and 4 and with the NVivo results.

When comparing our findings with the previous literature before 2020, it was apparent that the consumer’s use of smartphone technology had changed during the COVID era. Only one of the main themes (transportation) from the current study was mentioned in one of the articles before the COVID era (Mang, Piper, & Brown, 2016). In the current study, the number one theme was food and the subtheme was food delivery. This theme and subtheme were not mentioned in any pre-COVID articles indicating that food delivery was an emerging trend during the COVID era. Please refer to Table 5 for the Comparative Analysis of the pre-COVID and COVID eras themes. Please note the Subthemes have been colour coded to highlight the similar themes between the previous literature and the current study. The authors mapped the trends, patterns and relationships between the previous literature (pre-COVID) and the current literature (COVID era).

Table 5- Comparative Analysis of the themes from pre-COVID and COVID era

<table>
<thead>
<tr>
<th>Literature Authors</th>
<th>Main Themes</th>
<th>Subthemes than are similar to all results are color coded</th>
</tr>
</thead>
</table>

In the pre-COVID era, the prominent research themes were information/communication, social media, social activity, entertainment, translations, facilitation, mapping applications and transportation. Only information and transportation appeared in the COVID era literature. This could indicate that there is a gap in the literature during the COVID era on consumer use of smartphones in social media, social activity, entertainment, translations, facilitation, and mapping applications.

Information was the most frequently accruing subtheme for all but one of the articles before the COVID era. Information was also the second most frequently occurring subtheme in the current study. Based on the findings, the researchers concluded that there is a relationship between the smartphone consumer use of information and transportation in both the Pre-COVID and COVID eras.

The main themes that were in the current study that was not identified in the previous studies were as follows:

1. Food
2. Tourism
3. Fourth Industrial Revolution
4. Hotel Operations
5. Shopping

Before the COVID era, little research focused on the Fourth Industrial Revolution (4IR), relating to food, tourism, hotel operations and shopping. However, food delivery was the most common theme and sub-theme recognised in the current literature, including drone delivery, online delivery and Food Delivery Applications (FDA). Since the onset of COVID 19, 4IR has become a prevalent theme in tourism research due to the increased focus on the use of technology in automation and the application of contactless services. Therefore, further research is recommended on the 4IR and its impact on food and food delivery. Based on the findings, the researcher also recommends further research be conducted in the tourism literature on the application of the 4IR and how it is changing food service, tourism, hotel operations, and shopping. Some questions to consider regarding the smartphone consumers use during and after the COVID era include:

1. Will the food delivery trend continue after the COVID era with Smartphone users?
2. How will the 4IR affect the consumer's use of smartphone technology in tourism?
3. How will hotel operators apply the 4IR technology to enhance the service experience for smartphone users?
4. Will online shopping be an ongoing trend for smartphone users post-COVID?

The most prominent sub-themes in this study were:

1. Food Delivery
2. Mobile Apps
3. Smart Tourism Destination
4. Crisis Management
5. Service
6. Digital Certificates

None of the sub-themes was mentioned in the pre-COVID articles, indicating several emerging themes during the COVID era. Food Delivery and Mobile Apps have become an emerging theme in the literature due to the need for contactless transactions and the 4IRs. Smart Tourism Destinations are an emerging theme in the literature due to the growth of the Internet of Things (IoT) and 4IR. Cities and tourism businesses are investing massive amounts of money into smart initiatives to remain competitive. COVID 19 has made it necessary for all businesses to evaluate their Crisis Management and Resilience plans and develop new safe ways of conducting business. The way we conduct, and experience service is changing due to smartphone technology and the 4IR. The use of smartphone technology has been incorporated to communicate and inform consumers as well as conduct contactless transactions. Before COVID, digital certificates for...
travel, tourism and hospitality did not exist. Now it is a way of
life. Information communication technology (ICT) has changed
how we do business in the hospitality and tourism industry
since the COVID era. The 4IR is transforming the tourism
market, allowing smartphone users to do business anywhere
and anytime.

4. Conclusions and Implications

The Fourth Industrial Revolution is changing how smartphone
consumers use their devices for travel and tourism, especially
considering COVID-19 and the importance of contactless
delivery. The foodservice industry has grown substantially
using smartphone apps, drone delivery, online delivery, and
contactless delivery. Many smartphone users are getting used
to the ease and convenience of food delivery and may want to
continue this trend long after the COVID era. This research will
benefit tourism operators, policymakers, and researchers to
remain competitive in an ever-changing hospitality and tourism
environment. Hospitality and tourism operators need to be
aware of the fast-growing food, tourism, hotel operations and
shopping trends due to the Fourth Industrial Revolution. To
remain competitive, tourism operators must consider
integrating food delivery, mobile Apps, Smart Tourism,
Destination Crisis Management, Service and Digital
Certificates.

It is recommended that additional research is conducted on
smartphone technology and the traveler’s experience. If
smartphone technology is found to improve the traveler’s
experience, this would have a positive implication for travel
companies and smartphone businesses to improve their
competitive advantage in the 21st century, especially in a
Pandemic-Era.

5. Limitations:

One of the limitations of this study is that the data is
still emerging regarding the use of smartphone technology
during the COVID era. Only 22 articles met the criteria for this
study. Additionally, only papers with the keywords
smartphone, mobile phone, apps, tourism, tourist, travel and
Covid were included in this literature review due to the purpose
and research question. Further research on the patterns of
behaviour of smartphone users from a psychological
perspective may provide further insight into the behaviour of
smartphone users while travelling. It is recommended that
future studies explore the continued use of smartphones during
the next phase of COVID-19 to see if these behaviours change
over time.

This study only examined scholarly articles
published in the last two years to be relevant to the current
Covid era. As research data on this topic continues to emerge,
further studies should be conducted to include grey literature,
book chapters, books, and conference presentations.
Additionally, the limitation of using only hospitality and
tourism journals may have unintentionally excluded other
relevant literature.

However, this study is one of the first to review the
changes in Smartphone use during a pandemic. The use of
smartphone technology in food and food delivery is an
emerging trend that had not been mentioned in pre-Covid
studies. Further research in this area is recommended to
determine if this trend will be sustained as travel patterns return
to the pre-Covid level. Identifying these changes will provide a
useful road map for future research. Further studies could
consider the motives for consumers’ use of smartphone
technology and the inhibitors that prevent the use.


Sajinčič, N., & Starman, V. (n.d.). Use of Smartphone Cameras and Other Applications While Traveling to Sustain Outdoor Cultural Heritage. Sustainability, 13(13), 7312. doi:http://dx.doi.org/10.3390/su13137312

Journal of Resilient Economies, 2.1 (2022)


