ANALYSIS OF SMART GUIDE APP QUALITY DIMENSIONS AND ITS IMPACT ON TOURISTS' INTENTIONS TO REUSE: INSIGHTS FROM INDIA

Thesis Submitted for the Award of the Degree of

DOCTOR OF PHILOSOPHY

in

Tourism Management

By

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DECLARATION

I, hereby declared that the presented work in the thesis entitled **"Analysis of Smart Guide App Quality Dimensions and its Impact on Tourists Intentions to Reuse: Insights from India"** in fulfilment of degree of **Doctor of Philosophy (Ph. D.)** is outcome of research work carried out by me under the supervision Dr Sunil Kumar working as Assistance Professor in the School of Hotel Management and Tourism. Lovely Professional University, Phagwara, Punjab, India. In keeping with general practice of reporting scientific observations, due acknowledgements have been made whenever work described here has been based on findings of other investigator. This work has not been submitted in part or full to any other University or Institute for the award of any degree.

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CERTIFICATE

This is to certify that the work reported in the Ph. D. thesis entitled **"Analysis of Smart Guide App Quality Dimensions and its Impact on Tourists Intentions to Reuse: Insights from India"** submitted in fulfillment of the requirement for the reward of degree of **Doctor of Philosophy (Ph.D.)** in the School of Hotel Management and Tourism, Lovely Professional University, Phagwara, Punjab, India, is a research work carried out by Arvind Govinda Mahajan, Registration No.41900513, is bonafide record of his/her original work carried out under my supervision and that no part of thesis has been submitted for any other degree, diploma or equivalent course.

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Abstract

The rapid adoption of mobile technologies by travellers, as exemplified by smart mobile phones and related travel app, is altering the entire landscape of the tourism sector. Mobile technology provides personalized information as per need of the tourist during the tour at any time and any place. In reality, a mobile tourist guide can help tourists in locating locations of probable attractions to visit. Using such mobile tour guide tourist can save time, which required to find out human tour guide and fees of human guide. Numerous tourist destinations are still lacking modern high-tech amenities like mobile tour guides apps. The tourism sector is a seasonal one, and there is a seasonal shortage of tour guides who are authorized by the government. However, the Indian government's tourism ministry showed remarkable initiative by releasing the smart guide app for tourists. These apps are currently only accessible in a small number of tourist destinations, However, in the age of smart tourism destination smart tour guide apps are the alternative option for tourist. The Smart Guide App (SGA) is extremely beneficial to tourists and improves self-guided tours for outdoor locations. The first global app "Guiddoo," was lanced at Mumbai in 2013, its is personal tour guide app for tourist in India. According to press reports, the first government smart tour guide app for India's tourist destinations was launched in October 2019 by the government of India.

The audio guides that are used in many locations across the world However, limited acceptance of audio guides is due to their improper implementation, which necessitates further work on their functionality and the required uniformity in the content and app design. As present travel app guide services are limited by different mobile devices and the variations in their systems and programmes, it is necessary to examine app user intention. Low use of SGA indicate that the growth of smart guide app needs to be explore in India. Various studies conducted on travel app with different app quality dimensions and less research done on smart guide app, that's why research on smart guide app quality dimensions need to do with an Indian context. Less research done on the user acceptability for smart guide app and user intentions to reuse it. Need to investigate the function of smart guide app, like its components, including user characteristics, experience, complexity, and familiarity.

This study investigated usability growth of SGA in India, what are SGA quality dimensions, what is the influence of app quality dimensions on PU and PEOU. Does the app quality dimension influence SGA users' attitude to use SGA and intention to reuse SGA.

In this study, a quantitative research methodology was employed. 861 responses collected from the SGA users in India. Collection of data has been done by convenience sampling method, data were collected by using social media and field survey, all response collected by using google form. Systematic literature review done to identify app quality dimensions and develop research model and hypothesis. "Unified Theory of Acceptance and Use of Technology" (UTAUT) and the "Technology Acceptance Model" (TAM) theories are utilised to prepare the model. The data analysis has been done by using "Structural Equation Modeling" (SEM), some other test such as t test, ANOVA, "Confirmatory Factor Analysis" (CFA), Multiple Regression Analysis was carried out. Nonetheless, a comparison statistical analysis was conducted to determine the usability increase of SGA. To know more about SGA users and app quality sentiment analysis and content analysis has been done. The SGA user is the end user who uses SGA. Users submit feedback to app providers, after using the SGA app. Smart guide app users write reviews with the positive remark and negative thoughts about SGA based on their experience and the performance of the app during use. The objective of sentiment analysis is to identify the thoughts of SGA users regarding app performance and quality. Collection of data for sentiment and content analysis has been done from Google play store, data is easily available. According to SGA selection criteria 5 SGA are selected for study.1) Audio Odigos 2) Digi Tour 3) HopOn India 4) Pinakin 5) Trip My way app. Content analysis is useful to find theories and models, and it is useful to validate previous theory. Coding process of this method provided detail fact about research. Inductive research approach used for analysis off 1168 SGA users generated content and from 1168 reviews 438 in written format and remaining 730 like and reacted by the SGA users.

Important finding from the literature review is four app quality dimensions are identified. 1) Performance 2) Functionality 3) Facilitating condition 4) Information quality. Secondly Age group above 45 find SGA difficult to use and required more effort

to use and assistance from SGA is lacking in tour time saving and enhancing experience. Facilitating conditions, is the most important factors extract perceived ease of use among the 4 SGA qualities. It has been found that app quality dimensions have a positive impact on PU and PEOU, as well as a favourable impact on attitudes to use SGA. PU and PEOU has positive impact on attitude towards the use SGA. The partial effect of app qualities on attitude to use SGA is important finding of this research. App information quality is important factor to influence the attitude towards the use SGA. Because authentic, sufficient information, about destination motivate to SGA users. Outcome of sentiment analysis “Digi tour” SGA has highest positive sentiments score in among 5 SGA and lowest for negative sentiments. It indicates users find good experience as well as bad experience for the SGA. “Pinakin” SGA has score lowest positive sentiment score among 5 SGA. Furthermore, “Audio odigos” SGA found better in terms sentiment score.1168 UGC content are utilized for content analysis and overall SGA quality found “excellent,” “super,” “very good,” “nice”, “beautiful,” “amazing” etc from 568 reviews. Finally, outcome of this research is useful for SGA users, developers, SGA providers for planning and promotion of SGA. Developers can identify the issues with app and update app accordingly. Issues regarding registration, downloading, glitches etc. keep in mind at the time of launching new app. Ministry of tourism can identify need of this SGA and make further planning for implementation of SGA at other tourist attractions in India.

Acknowledgement

I would like to express my wholehearted appreciation to Dr. Sunil Kumar, Assistant Professor, School of Hotel Management and Tourism, Lovely Professional University Punjab, India, for allow me to work under his supervision, His positive attitude, vision towards the work, planning and implementation of work have all left an indelible impression on me. He taught me how to conduct research and create a report as simply as possible. Working and studying under his direction was a wonderful honour and privilege. I am eternally grateful for everything he has taught me. I'd like to thank him for his friendship, kindness, and fantastic sense of humour.

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Arvind Mahajan

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Chapter 1

Introduction

Technology plays a major role in the tourism sector. Tourists use their smartphones to make reservations for hotels, flights, buses, and trains as well as to plan their tours. However, once they are on tour, they use their smartphones to find their way around, understand traffic and weather forecasts, take pictures, and use tour guide mobile apps during the sightseeing. Smart tour guide app technology provides accurate and reliable information about tourist destination. Furthermore government-approved tour guides, city guides, museum guides, and wildlife guides available at tourist destinations. However, supply of such government authorised human guide is inadequate during the season, compare with the arrival tourist at destination and available tourist guide ratio. Smart tour guide app is the alternative option for tourist to save tour guide expenses and required time for sightseeing. Affordable alternative option of smart tour guides apps is available in app stores. Tourists can download from google play store and use it on smart phone in offline or online mode. According to press information bureau," Audio Odigos" is the first Indian government Smart Guide App (SGA). Launched by ministry of tourism of the government of India " in October 2019 (Mahajan et al., 2021). Guided audio tours are offered by "Audio Odigos app", which are verified content by the Indian government. Features of "Audio Odigos" are visual, voiceover support. Users of "Audio Odigos," have a memorable tour experience and leave a destination with historical understandings of Indian culture and tradition. An embedded site map in the "Audio Odigos" app allows users for easy site navigation throughout the tour. History will be presented to users in a variety of ways, including summaries, detailed histories, and podcasts versions. The language and history version of the audio can be chosen by the app users. All Android and iOS enabled mobile devices support to download "Audio Odigos.", and other SGA in app store. This research will be going to investigate usability growth of SGA, influence of app quality dimension on PEOU and PU and reuse intention of SGA users.

The utilisation of mobile guide app services can help to boost the tour's efficiency (Chuang, 2020). Acceptance of smart tourism apps in museums is quite limited, with

some places suggesting a strong potential for future use (Naramski, 2020). In 1952, the first audio guide prototype was used at the "museum in Amsterdam" (Othman et al., 2013). According to Rabotid in tourism human guide is olden activity (Rabotic, 2011). The guide has played an important role in creating a tourism market by ensuring that tourists have a pleasant experience and intend to return to the destination (Cohen, 1985). Experience of smart tourism technology meet the user's preference according to the user requirement regarding personalize service, however audio guides used by visitor at various tourist attractions which is not implement properly. User feel discomfort while use it, because there is no uniformity in designed and its was cause of low adoption of audio guide (S. J. Lee, 2017). Concept of smart tourism introduced by Buhalis and Amaranggana and its was started from smart city (Buhalis & Amaranggana, 2013). According to S. J Lee Use of audio tours in cultural background sites, which is comparatively low-tech, is using era for the traveller's own comfort, satisfaction and if smart tourism is defined as the traveller's use of era to satisfy his or her want. But fact is that many tourist attractions still don't have all of the latest high-tech equipment, travellers experience regarding use of technology and using an "Audio guide" should be productively viewed as a smart experience in a cultural heritage site (Lai, 2015). Smart tour guide for mobile phones provides location base tourist guide application for the indoor and outdoor environment developed smart tourist guide system is extremely helpful to tourist to enhance self-guided tour (Kang et al., 2017). Reported by Sarumakti story behind "Pinakin app" launching is during the Tajmahal visit Agra in 2014, Mr Iyer could not find authorised tour guide and he decided to find solutions to this problem and the outcome is "Pinakin app" (Sarumathi k, 2018).

According to Lee mobile phone are useful platform for to use SGA in smart phone. Tourist can use such SGA from the any location, to use such guide no additional technological support requires such as PDA (S. J. Lee, 2017). Despite the tourist using smart tour guide at the destination, it is common to see a visitor at a heritage destination site expecting a human tour guide instead of using the smart audio guide, most of the research concentrate on the IT perspective (Oh et al., 2016). However, what about SGA users, why they use audio guide at tourist places? that need to be investigated, and few studies investigated acceptance of technology. According to Ivan K. W. Lai, among the few studies that used the "Technology Acceptance Model" (TAM) and "Theory of Plan

Behaviours" (TPB) to study tourist adoption of mobile technology, the study discover tour experience with use new tourism technology at tourist sites positively influenced PEOU and PU (Davis, 1989). and that elements are associated to travellers' opinions towards utilising a mobile device and their intention to use theme in a tourism scenario (Lai, 2015). User experience with mobile app technology need to explore in details because majority of scholars have focused on how consumers embrace and use mobile technology (Gretzel et al., 2015:,Dorcic et al., 2019).

Research related to smart tourist place has been restricted because the majority of earlier studies concentrated on characterising smart tourism technologies. Technology is utilised to enhance the tourism experience at smart tourist sites. There isn't many research that have looked at how smart tourism technology affects outcomes like satisfaction and the overall visitor experience. Few academics provide an explanation of the connection between visitor behaviour and the adoption of smart tourism technologies (Jeong & Shin, 2020). To improve the visitor experience at the site, however, the usage of technology is essential. Furthermore, the tourism sector is seasonal, and during the vacation or season the flow of visitors to a tourist destination increases. The workload on various tourist services and the demand for tourist guide destinations such as cultural heritage increased. Technology such as the Smart Guide App (SGA) is an appropriate solution for during the season. Technology use is in the tourism sector is part of smart tourism. The government of India is working on a smart city mission smart tourism is an extension of a smart city. Tourist places like Chhatrapati Shivaji Maharaj Vastu Sangrahalaya in the Mumbai, The Global Vipassana Pagoda in Mumbai, and Gandhi Teerth in Maharashtra Audio guide tour is available for tourist. The number of tourists visit at mentioned tourist places at every day, tourists used smart mobile guide app during Mumbai city tour and at "Global Vipassana Pagoda" Mumbai. App like "HopOn India" can be used by tourist during Mumbai city tour.

However, 22 usability principles were developed by Ko et al.(Ko et al., 2013). Future research needs to explore user points of view for virtual recreations and its usability at cultural heritage background destinations (Briciu & Briciu, 2020). App system quality needs to be explore in the future (Yaeri Kim et al., 2021). According to Mahajan et al it

is vital to conduct considerable research on how the individual users of technology use it and adopt it (Tamilmani et al., 2021). Future research need to explore for app efficiency (V & Sabarish, 2021). Further research will address user suggestions, and usability, user experience, and comparative research (Boletsis & Chasanidou, 2018). Designing and assessing augmented reality smartphone applications with a focus on user-centred principles. Concerning to the above needs to identify what are the expectation of Indian tourists from smart guide apps. How they intend to use smart guides as well as the qualities and impact of the app on tourist attitudes, must be investigated. According to objective of this research, as outcome of literature the four qualities of an app are identified. performance, functionality, facilitating condition, and app information are the four app quality dimensions. This study based on the hypothesis model. Which has been prepared with the Venkatesh theory UTAUT (Venkatesh, 2015). User acceptance on information and communication technology study done regarding perceived ease of use and perceived usefulness. The use of this model to know the adoption of technology by users in the tourism industry (Davis,1989). Moreover, TAM is useful for study regarding the adoption of apps and PEOU of smart guide and PU of smart guides apps positively influences on smart guide apps adoption (Mahajan et al., 2021).

1.1 What is Smart Guide App

Nowadays, technology has improved and it is useful to fulfil the tour planning need of travellers, by several applications, such as the smart tour guide have been developed for sightseeing tour. A smart tour guide is a system that guides and informs visitors and travellers about tourist attractions. Currently, Augmented Reality (AR) applications in tourism are used to convey historical or cultural information in the form of text, photos, or even virtual objects. (Meliana & Su Mon, 2021). A mobile tour guide is a software program designed to operate on devices such as Personal Digital Assistants (PDAs), mobile phones, and can be enhanced with features like General Packet Radio Service (GPRS), Global Positioning System (GPS), and Bluetooth wireless technology. Travel applications for smartphones are characterized as apps intended for travellers or those utilized within typical travel scenarios. (e.g., Make my trip, Incredible India, IRCTC Indian rail app)" Lu et al. (2015). The system measures the location's latitude and

longitude and plots it on a map for the benefit of potential visitors is call smart tourist guide system. Indian locations are also assessed. It is a free application that incorporate the path length between the user's location during the tour and the desired locations in which all can navigate by itself, making it more location-specific. The application will contribute to modern, efficient, and easy to use for tourists (Chavan et al., 2019).

Tourist use mobile phone during sightseeing tour and they access mobile tour guides app at anytime from anywhere. However, they can use such app before reaching to tourist destination or sightseeing places. Furthermore, they can plan tour itinerary and take experience of sightseeing through the app. These app are useful in itinerary, tour planning, travel places information, buy tour packages. Tourist come to know information about hotel, restaurant, booking of hotel, transportation booking. (Chuang, 2020). According to Locatify web, a travel app called smart guide makes it simple to create and take advantage of authentic local tour guide experiences. Content Management System (CMS) is useful prepared good quality content which are available in to the app which are useful to plan sightseeing tour. Such content delivers contextual information about user's surroundings using maps which are supported by location-based technology. Anyone who wants to connect with their surroundings during a tour or encourage others to interact with it should use smart guide. Visitors can access a variety of tours hosted by smart guide from the app's home page or using invitation codes. As reported by smart guide web portal a tourists app called smart guide makes tours more attractive to a wider range of visitors. The app offers functions like self-guided audio tours, always-accessible offline maps, and augmented reality features that let visitors explore on their own, whenever they want, and at their own pace. The audio tours are available in a variety of languages, so visitors never have to worry about not being able to find a tour in their language. Since many guides are free, any visitor's budget can be accommodated by a digital self-guided tour.

Image 1.1 Technological key Development in Tour Guide form Human Guide to Smart Tour Guide App

Source: Prepared by author by using images from Google play store and Wikipedia.

With reference to image 1.1 following is the technological key development in tour guide form Human guide to Smart tour guide app.

- Concept of human tour guide started from the path finder, However Japanese tourist started book tour guide and consulting with human tour guide since 1787 (According to Wikipedia).
- The first-time prototype of audio guide was used at Amsterdam Museum in 1952 (Othman et al., 2013).
- Mr. Iyer first introduced smart tour guide in India (Sarumathi k, 2018).
- Ministry of Tourism Government of India launched Audio Odigos app in October 2019 (Press Information Bureau).

1.2 App Qualities Dimensions

Augmented reality and gamification methods open up a fresh dimension within virtual reality, elevating the attractiveness of specific destination. he evolution of mobile tourism apps is driven by the utilization of visualized technology. These applications leverage features like apps, GPS, and location-based tracking, streamlining data collection for providers and making travel more convenient. Personalized guest experiences are valuable outcomes of the evolution of advanced technology, and they will necessitate increased investment in the concept of co-created experiences from tourism providers and application developers. These features can assist providers in

setting their applications apart from those of their rivals. In conclusion, through a process of innovation in mobile technological advancements will persistently alter and redefine users experience (Dorcic et al., 2019). Vinodan and Meera conducted a study on the adoption of mobile tourism in India, and it has the following features. Performance goals include how useful a technology, how it is productive, and expectations regarding performance. Comparative, advantages and how much time required to use, does it is useful to learn, easy to use, or is there any efforts required to use it. Complexity, Network externalities, trialability, and installation specific to a given technology language that is specific to a country because each country has their own specialty, technical infrastructure may be different, legal restrictions as per country policy, diversity, and exposure are all necessary. Financial standing, knowledge level, compatibility, assistance accessibility, and accessibility all require facilitation. Influence from peer group and the media, trust, and educational level should be personal-centric (Vinodan & Meera, 2019). In a study on Indian tourists' use of self-service hotel technology, Kaushik et al. measured the following app qualities. Need for interaction, perceived risk, attitude toward self-service technology, intention to adopt or use self-service technology, perceived usefulness, perceived ease of use, trust , arbitrary norm (Kaushik et al., 2015). User engagement with travel apps for smartphones is massively increased by the quality of service, quality of system and what kind of information quality. Additionally, how the users are engage and it has a positive and significant effect on behavioural intentions, app love, and app satisfaction for smartphones (Ali et al., 2021). Analysis shows that user interaction with the travel app is influenced by the visual, informational, and collaborative design. Additionally, the finding regarding consumer attractiveness positively influences consumer behavioural intentions to use travel apps (Tak & Gupta, 2021a). This is the first time that an experiment method has been used to study user adoption intentions of a tourism app. According to the findings, person's assessment of the system's utility and contentment is notably shaped by the quality of information and the overall system quality within the system's design. However, the improvement in PEOU is negligible. As per the research, improving the quality of both the system and the information in tourism apps will indirectly impact the user's tendency to utilize them. (PAN et al., 2017).

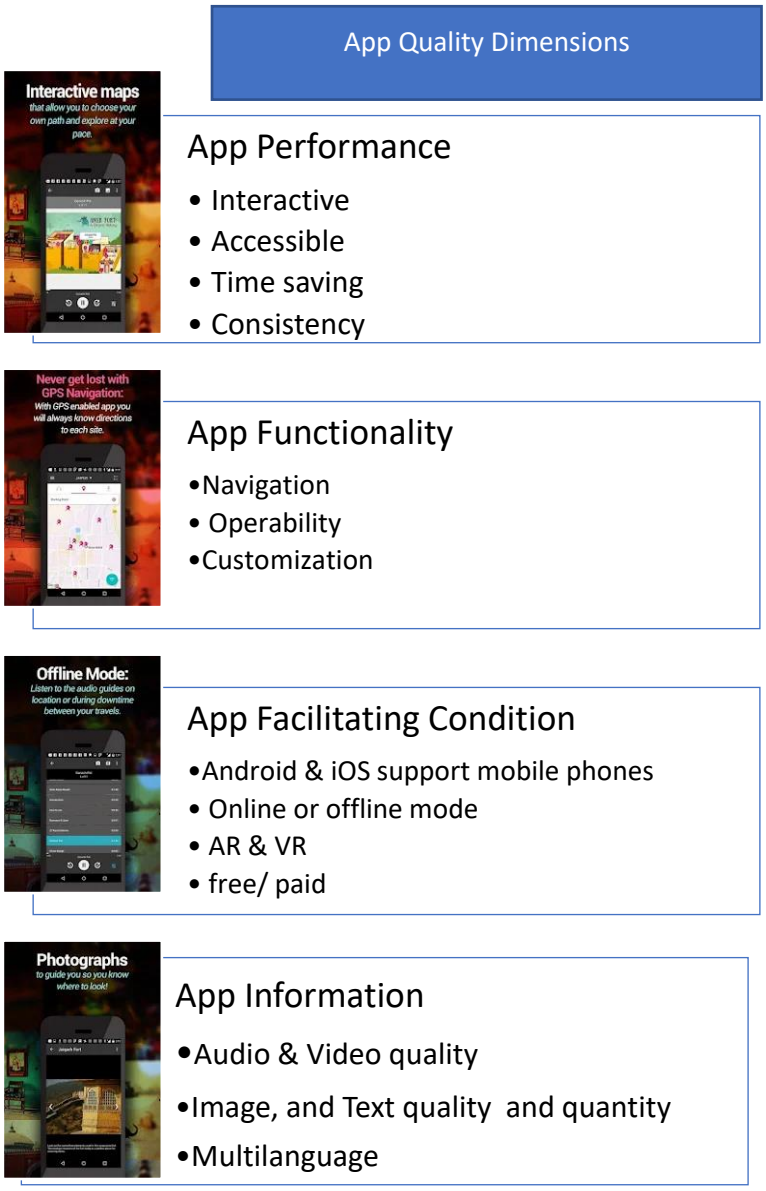


Fig. 1 Smart Guide App Quality Dimensions Source: prepared by author

According to the literature review of this study, various apps have been tested with various theories and app qualities by various authors, but this study has identified four app qualities. 1) App performance: The app should be user-friendly, interactive, and a save user's time. The performance of the app during use should be reliable. 2) App functionality: Visitors use the app for a sightseeing tour and tourists can navigate sightseeing places. Users should be able to operate and customise smart tour guide apps.

3) App Facilitating Conditions: The app has the ability to be used on Android and iOS mobile devices, and it can operate in online or offline mode and with AR and VR functions. The user can use the app for free or to purchase. 4) App Information: A smart guide app's audio and video quality should improve the tourist experience. The quantity and quality of the images and texts should create memorable experiences. To enable use of such smart guide apps by local, regional, national, and international users, the information should be National, regional and international languages. Do the users re-use these high-quality app during a sightseeing tour? The study has investigated re-use intention of smart tour guide app users based on mentioned app qualities.

1.3 Smart Guide Apps in India

According to information found in the Google play store, there are a few Indian tour guide apps available for tourists. These can be downloaded from the app store such as apple or google play store. A few of these apps are free for tourists, while others can be purchased for a very low price. Such apps are available to use in offline or online mode for tourists. Ministry of tourism government of India launched the Incredible India app in 2014 which is a cutting-edge initiative of the ministry of tourism. To help both domestic and foreign visitors promote India as a holistic travel destination. Purpose behind app to focused on significant experiences like, culture of India, yoga, wellness, spirituality, heritage destinations, adventure activities and more.

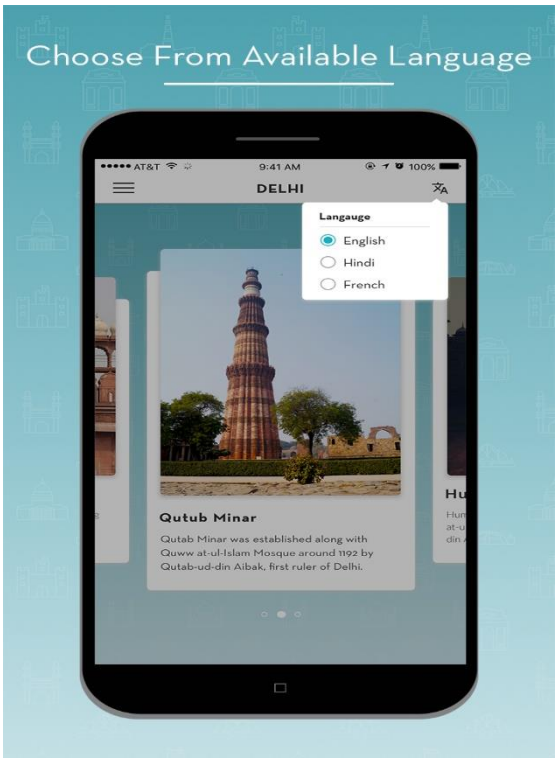
The mobile app was created according to today's traveller requirement. The app is outfitted with features to help the user at every stage of their journey to India and adheres to international trends and technological norms. The app exemplifies the ministry of tourism's dedication to using technology to deliver services. However, this application responds to the following tourist queries: 1) How to go? When to visiting a destination 2) What to see at tourist destination 3) Where to stay at tourist places. Furthermore, this app is unusable as a tour guide, so in October 2019, the Indian ministry of tourism launched the “Audio Odigos” app, the country's first tour guide app in India by government of India.

1.3.1 Audio Odigos App

Tourists can easily and quickly download "Audio Odigos" in free of cost and begin learning about the history of many famous Indian heritage sites, whether they prefer to travel independently or can always find a local expert human guide. As part of the "Adopt a Heritage" initiative, “Bird Apps” has developed a free audio tour app in partnership with the State/UT governments, the Archaeological Survey of India (ASI), the tourism ministry, and the Indian government. The goal of “Audio Odigos app” is to act as a personal tour guide for visitors and Indian citizens through immersive audio-guided tours. It also aims to distribute open source, genuine content.

Users only need to download the “Audio Odigos app”, choose their preferred language as shown in image 1.2 and city, and then explore the many iconic places with content that has been approved by the ministry. English, Hindi, Japanese, Korean, and other regional languages will all be available on the app.

Image 1.2 Selection of language Option in Audio Odigos app



Source: - Google play store app information

There are three formats available for tourist to select from the following.

- Synopsis: If a traveller has limited time to visit a destination but still wants a quick overview of its top attractions, they can use the synopsis version.
- Detailed- If tourists enjoy being immersed in real users of the places they visit? Tourists can then choose this version to fully experience a location's rich history, culture, and heritage.
- Podcast: This version has simplified tourist sightseeing. With this app's entertaining podcast version, learn about a location and its history.

To use this app internet connection or data roaming are not required. Tourists can download this app on to their phones for easy offline use.

Image 1.3 Lunching of "Audio Odigos" app by the Tourism Ministry of Indian Government in October 2019.

Source: - Press Information Bureau Tourism Ministry of Indian Government

1.3.2 Pinakin App

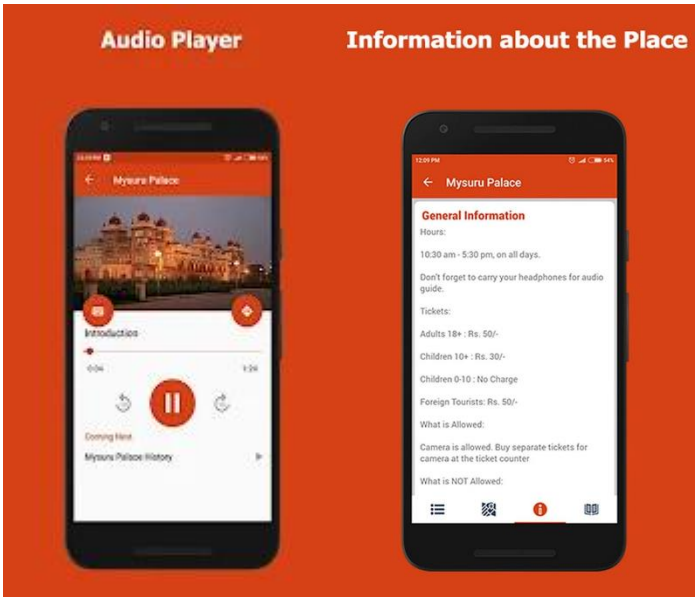
The storey behind introduced this app was when Mr. Srikanth Iyer travelled to northern India in 2014, he had a personal travel experience that led to the creation of this mobile app. He decided to hire a guide at various tourist attractions in Delhi and Agra after searching online in desperation for one. However, Human guides were expensive, and the information they offered was relatively limited. Even the electronic travel advisories fell short explained by Mr. Iyer. According to Apple store this app is available in the two southern Indian states: Tamil Nadu and Karnataka. "Pinakin app" is an audio guide for every Indian and foreign visitor to South India. Once tourists use this app, their

'photographic memories' will transform into 'information memories' that will last a lifetime, with stories to tell their friends and family about Incredible India!

Highlight of Pinakin app

- Audio content is intended to keep tourists entertained for 1.5 to 2 hours. As mentioned in image 1.4
- There are interesting stories, amazing facts, and trivia.
- Information about the location, its history, ticket prices, parking information, dress code, and so on. As mentioned in image 1.4
- This app is available in a variety of regional and national, international languages, including English, French, Hindi, Kannada, and Tamil.
- Tourists can use this app offline.
- In October 2022, tourists will be able to purchase Prime 1 and Prime 2 memberships at a cheap price around rupees 99 per year subscription.

Image 1.4 Audio Content and Information About the Place in Pinakin App



Source: - Google play store app information

1.3.3 Trip My Way App

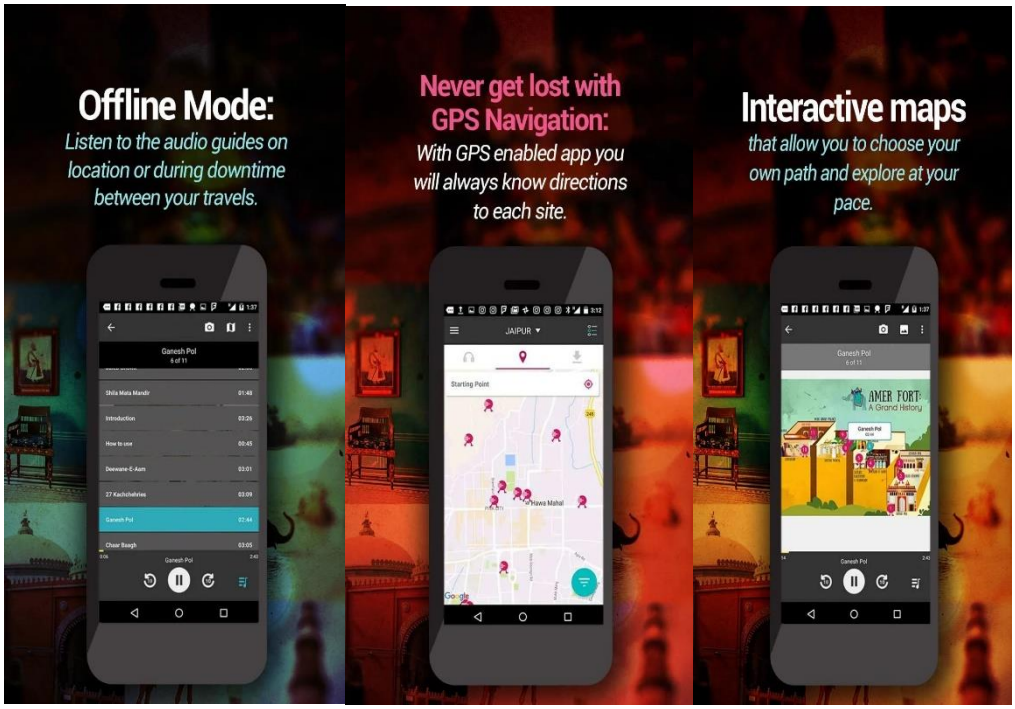
According to information available in the Google play store, the “Trip My Way app” provides content recorded by certified local tour guides. Its stories range from self-guided audio tours, historic walks to taking tourists off the beaten path by providing

cultural information. This app offers audio tours as well as a comprehensive list of over 150 Delhi heritage sites and 200 Rajasthan heritage sites in 16 cities.

Features of Trip My Way App

- Tourists using the “Trip My Way app” can be download audio tours via Wi-Fi at home or at their hotel. Change to offline mode and begin walking tours as shown in image 1.5.
- Interactive maps that allow visitors to see their own path as shown in image 1.5 and explore at their recreation.
- Tourists can use the GPS and navigation functions of this app as shown in image 1.5 to get directions to each site with a GPS-enabled app.
- This app's bookmarking feature allows tourists to bookmark their favourite sights so they are always at their fingertips.
- All audio tours are free for tourists.

Image 1.5 Use of App in Offline Mode, Navigation Feature and Interactive Map of Trip My Way App



Source: - Google play store app information

1.3.4 Digi Tour App

With reference to data found in the Google play store the immersive audio-visual guided tours offered by the “Digi Tour app” are only available for historical monuments. It is a dedicated digital pocket guide for historical sites.

It offers the most accurate information in the chosen language, including epigraphy, iconography, history, and architectural features of temples, monuments, forts, etc. These include Hampi, Belur, Halebedu, Somanathapura, Badami, Aihole, and Pattadakallu, among other important Indian heritage sites. There are many more monuments planned for both India and other countries.

For tourists, historians, educators, students studying architecture, and adventure travellers, this app is a necessity. “Digi Tour” turns visiting monuments into an educational experience. Virtual and mixed reality are also supported.

1.3.5 HopOn India App

According to the Google play store, when using the “HopOn India app”, tourists learn about well-known museums and monuments as well as lesser-known gullies and mohallas, as well as topics like cricket, sports, and food. This app offer tours in seven different cities: Varanasi, Delhi, Mumbai, Kolkata, Aurangabad, Jaipur, and Leh.

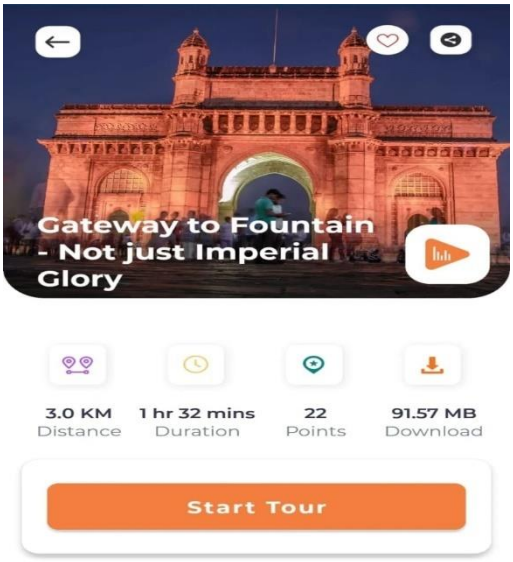
After downloading the app, users must sign up, grant location and media storage access, provide an OTP for authentication, and either pay for the tour of their choice in full or feed a promotional code.

User-friendly app features

- This app offered two different types of tours: 1) Location-sensitive GPS for open, spacious monuments and streets user can choose tour as shown in image 1.6 .2) Keypad-enabled Museum and art tour.
- For the best experience while on location, users can use the "Navigation" mode. By selecting the "Virtual" mode, visitors can also hear the stories from a location.
- If users have downloaded the tours in advance to their phones, they can listen to them offline, in aeroplane mode, or without internet access.

- To give users a more wholesome experience, some tours also included images and videos.
- When using the app, users can use the pause, forward, and rewind buttons.

Image 1.6 Location Based Street Tour in Hopon India app



Source: - Google play store app information

1.3. 6 Global Vipassana Pagoda App

Specifically speaking, in relation to the “Global Vipassana Pagoda app” this app provided historical details about the “Global Vipassana Pagoda”. This is the monument of Peace and Harmony, which was built in the Mumbai, India, suburbs as the result of S.N. Goenka's inspiration and vision. It is a token of appreciation for Myanmar, whose small population, the monastic teacher-student tradition, has ensured that the practical component of the teaching, known as "Vipassana," has been preserved in its pristine purity for more than two thousand years.

“The Global Vipassana Pagoda” is one of the tallest stone structures in the world and has the largest stone dome without pillars in the entire world.

The Pagoda is one of the seven wonders of Maharashtra, according to the tourism department of the Maharashtra government.

App features include:

- Users of the app can take a self-guided audio tour of the 25 points of interest at the Global Vipassana Pagoda in English, Hindi, and Marathi languages.
- The 122 paintings in the painting gallery that depict the beginning and growth of vipassana are available for audio tours in English, Hindi, and Marathi to app users.

1.4 Smart Guide App Use in India

According to information available on the Google play store, Fig. 1.2 depicts the number of users who have downloaded the smart guide app until October 2022. According to the ministry of tourism's statistical report on domestic tourist visits to Indian states and union territories from 2009 to 2019, the trend has been upward. Domestic tourist visits, on the other hand, will decline in 2020 and 2021. -73.72 percent and 11.05% growth, respectively. However, use of the smart guide app has been very low. According to the available statistics, the most installed app was "Pinakin app," and the least installed apps were "Audio Odigoes" and "Digi Tour app

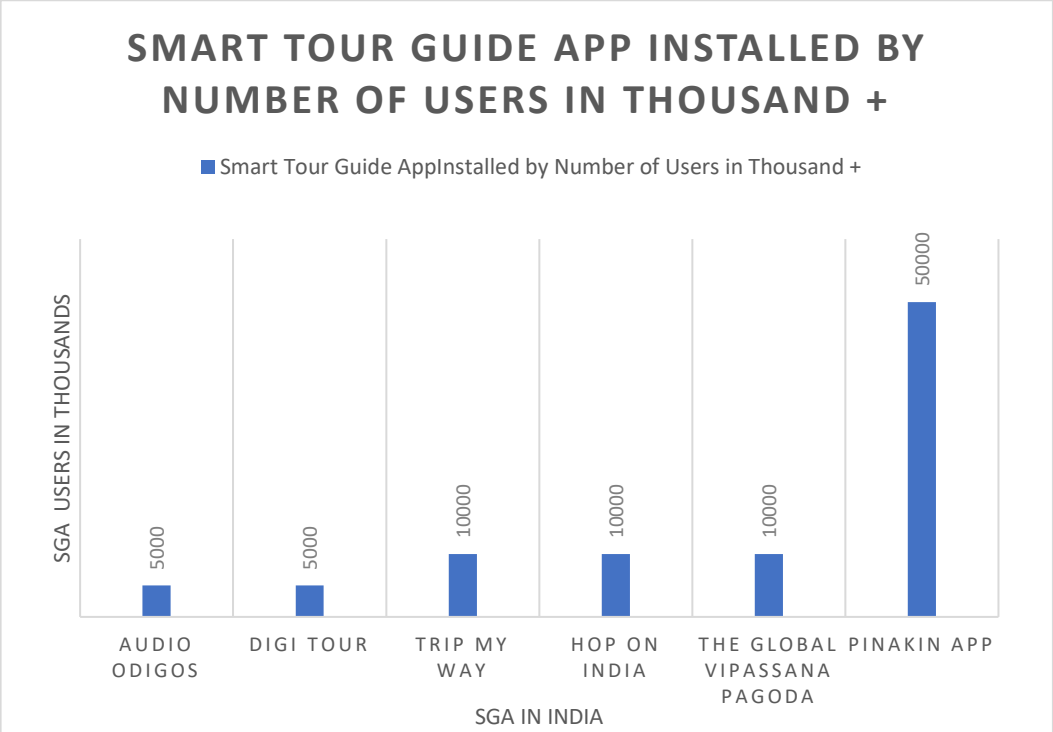


Fig. 1.2 Use of Smart Guide app in India.

1.5 Why This Research

India has adopted smart city mission; concept of smart tourism starts from the smart city. According to Buhalis and Amaranggana concept of smart tourism start from the transformation of smart city and use of smart tourism technology at tourist place. However smart tourism technology enhances tourist experience. Smart tour guide app is new technology in India and low use of SGA in India indicates, low adoption of SGA as comparative world. What are the India app qualities which influence attitude towards the use SGA and intention to reuse SGA. Previous studies conducted on other travel related app such as hotel reservation, travel planning etc. there is less research on SGA in India. This study will investigate app quality dimensions and its influence in consideration of Indian app attributes.

1.6 Background of Study

Today, mobile phones have evolved into versatile tools that can function as intelligent tour guides, offering tourists a wide range of information services and navigational assistance from anywhere and at any time. Utilizing the Google Maps application, these smart travel guides enhance flexibility in navigation, eliminating the necessity for supplementary devices like renting a PDA audio device. (Oh et al., 2016). Tourists use smart technology to enhance their experience in smart tourism. In 2015, the government of India declared a smart city project for 100 cities in India. A smart city is associated with urban development and development is dependent on smart user-friendly technology, and many cities in India are adopting this theology (Kumar, 2016). Such imitative transforming Indian tourist cities in to the smart tourism cities. According to the tourism ministry of Indian Government press information bureau (03-October 2019 21:07 IST), The Tourism Ministry has launched an audio guide app which is known as Audio Odigos app which useful for 12 Indian tourist destinations. This is a very good initiative by the Tourism ministry of the Indian Government. The features of this application are that tourists can download it on their mobile devices, that it has an in-built map and navigation, that they can choose the language according to their needs, and that authentic information about tourist destinations is available. This application will be available for 100 destinations in India soon.

The intention to use a Personalized location-based mobile tourism application is influenced by several factors, including the quality of information, perceived usefulness, and perceived ease of use (PEOU). Additionally, the perceived usefulness of the app is shaped by both information quality and perceived convenience. The intention to use the system is influenced by several factors, including perceived ease of use, information quality, and system quality. Furthermore, the perceived ease of use is notably impacted by information quality, system quality, and one's own perception of ease, all of which collectively contribute to the intention to use the system (C. C. Chen & Tsai, 2019). In the context of symbolic adoption, there are three underlying factors. It has been observed that the inclination towards adopting M-tourism in India is affected by factors related to perceived effort, country-specific facto and technology-specific considerations (Vinodan & Meera, 2019). Limited research has been conducted on the factors that drive travellers to persist in using travel apps. It's a valid assumption that the factors affecting the initial adoption of an app differ considerably from those impacting a user's ongoing usage patterns. This discrepancy arises from the fact that a user's perceptions and attitudes towards an app can shift based on their real-life experience with it. (Choi et al., 2018). Considering that a significant portion of the world's population has already embraced new technologies, it becomes imperative for research emphasis to transition from "adoption" to "sustained usage." Often, mobile apps are downloaded and stored on portable devices but end up being utilized only once. In fact, within the first 30 days of installation, fewer than 20% of users return to an app (Perro, 2018). The user-friendliness or ease of use of mobile travel applications is associated with both cognitive and emotional involvement. Conversely, compatibility seems to motivate users to utilize these apps for travel purposes. Existing studies on various app categories provide further evidence of the link between compatibility and customer engagement in the context of mobile travel applications (Tian et al., 2021). Research has been conducted on mobile devices, mobile technologies, online websites, hotel websites, and online purchases by other authors, but only one study has been conducted based on knowledge on mobile electronic tourist guides by Peres Correia and Motilal. Regarding the other studies that used the technology acceptance model in the field of Hospitality and Tourism,

most of the studies showed a negative positive effect on satisfaction, behaviour, and trust (Lai, 2013).

Tourists take into account various factors when choosing a mobile application for tourism. These factors encompass design elements like visual aesthetics and user-friendliness, individual factors like their anticipated personal benefits, enjoyment, and the opinions of others, as well as practical considerations like the anticipated effort required, expected performance, and the likelihood of successful conversion when picking a tourism mobile app (Sánchez-torres & Argila-irurita, 2021). In India, there have been limited study on the use of these apps and the intention to reuse them. The tourism field is seasonal, and there is a seasonal shortage of government-licensed tour guides with reference to table 2.6.1 given statistic information of Human tour guides and arrival tourist. The Indian government's tourism ministry, on the other hand, demonstrated remarkable initiative by releasing the smart guide app for tourists. These apps are currently only available in a few tourist destinations, and more research into app reuse is required. App quality dimensions, app perceived ease of use, and app usefulness all have an impact on app user retention intentions.

1.7 Significance of Research

The importance of this study is that, it contributes to both app developers and app users, by investigating what kinds of app qualities are important from the users' perspective. How does app performance affect users' intentions to reuse the app? The usefulness of app qualities and perceived ease of use of an app influence app users' intention. This study will investigate how audio quality, image quality, and multi-language function all play a role in reuse intention of SGA. Finding from the sentiment and content analysis are not only useful for app providers it will, useful to app developers. Arrival tourist in Maharashtra and supply of authorised human guides was found inadequate according to statistics. However, statistics indicate low use of SGA in India, comparative with World. Research outcome will

useful for policy making regarding marketing, develop and implementation of new SGA in India. Planning and management of smart tourist destination in India.

1.8 Research Questions

1)What is the usability growth of tourism smart guide apps in India?

2)Which are the qualities of smart guide apps?

3)What is the impact tourism smart guide app quality dimensions on of PEOU and PU on app user?

4)What is the impact of PEOU and PU on tourists' attitudes and intentions to reuse SGA?

1.9 Aim and Objectives

The purpose of this study is to discover answers of the research question. This research will be examining usability growth of SGA from the literature reviews. Invention in technology is going on, it necessary to identify what are the new SGA quality dimension. What is the influence on PEOU and PU of SGA qualities. Using the SGA is how easy for users and how it will enhance users experience and speed-up tour during the sightseeing. How the App quality dimensions, PEOU, PU influence attitude to use SGA and intention to reuse SGA need to evaluate.

1.10 Research Methodology

Aim of this study is analysis of smart guide app quality dimensions and its impact on tourist reuse intention. According to the literature review of this study, app quality dimensioned identified. This research has objectives and to fulfil the objective targeted research methodology is required. Research methodology serves as a systematic approach for addressing the research issue, essentially representing the science of conducting research. Within this context, we delve into the numerous techniques that a researcher usually employs to investigate their research question, along with the rationale guiding these choices. It's imperative for the researcher to

possess a comprehensive understanding of methodology alongside their knowledge of research techniques and procedures (Kothari, 2006).

The scientific method comprises a structured framework for building scientific knowledge, encompassing techniques for conducting dependable observations, analyzing outcomes, and drawing broader conclusions. This method empowers researchers to assess theories and prior discoveries in an objective and autonomous manner, fostering open dialogue and allowing for potential revisions or enhancements (Nayak & Singh, 2020). Research design can be broadly categorized into two primary domains: (a) qualitative research and (b) quantitative research. Researchers make the selection between these quantitative, qualitative, or a combination of both methodologies based on their objectives, subject matter, and research inquiries, aiming to acquire, collect, and assess data to enhance comprehension of a specific issue. Common research procedures encompass delineating research queries, assembling data, scrutinizing that data, addressing the research questions, and concluding the findings (Yannis & Nikolaos, 2018).

This study used a quantitative research method. This study makes use of both secondary and primary data. Respondents for this study are smart guide app users. This study's research area is Mumbai, Maharashtra state. A pilot study and questionnaire validation were carried out. Sentiment analysis and content analysis has been done on 1168 SGA users reviews. This study was analysed by using structural equitation modelling. The detailed research methodology was explained in detail in Chapter 3.

1.11 Summery and Structure of Thesis

Chapter 1

The first chapter provides an overview of the study and field. It provides an overview of the topic and addresses why this field was chosen for study. The study combines the principles of smart guide app quality dimension with the Indian context and user re-use intention. The research questions are addressed, as well as the problem investigated under consideration, the significance of this research, and

a brief description of the smart guide app for the study, objectives, goals are explained.

Chapter 2

The second chapter is regarding reviews of literature which provide overviews about previous research, finding, scope, what has been done in the past and what needs to be done. Chapter provide overviews about app quality dimensions and definition of app qualities. Chapter also discuss the theory of acceptance of new technology and development of hypotheses and model. However, study is in Indian context so research in India, attributes of India app, comparative statistics of global and Indian SGA. through the literature app quality dimensions are identified. Usability principles are listed from previous research. This chapter will be useful to know about SGA app quality dimension in past, present and future research scope.

Chapter 3

This chapter describes about how the research conducted what are steps are used. Why particular method adopted, why convenience sampling used. What kind of analysis done, SGA selection process, sentiment, and content analysis process. Over all this chapter will assist redder how to do the step-by-step research. How the user generated content useful in the research.

Chapter 4

This Chapter describe data analysis and data interpretation. From the demographical data analysis to structural equation modelling analysis. Result of t-test, ANOVA, Chi-square, Confirmatory factor analysis, Model fit summary, research model. Result and finding of sentiment and content analysis.

Chapter 5

This chapter discuss about important findings of research and suggestions for SGA users, SGA developers, SGA providers. Chapter illustrate with research implication and limitation and future scope for research.

Chapter 2

Review of Literature

2.1 Background of Smart Tour Guide App

The human tour guide services are considered an ancillary service in the tourism industry and are one of the oldest human activities (Rabotic, 2011). During the tour, the travel company provide tour guide to the tourists. The guide is primarily responsible for ensuring participant satisfaction because he or she able to identify the need of the tourist during sightseeing tour and according maintain the quality (Geva & Goldman, 1991). Through tourist satisfaction, tour guide interpretation influences destination loyalty indirectly. There are stronger correlations between tour guide interpretation and tourist satisfaction, as well as tourist satisfaction and destination loyalty, for tourists who perceive a high level of playfulness and flow in their tourism experience (Kuo et al., 2016).

However, in the age of smart tourism destination smart tour guide apps are the alternative option for tourist. In 1952, the Stedelijk Museum in Amsterdam made history by introducing the world's first museum audio tour (Othman et al., 2013). As reported by linkedin web it was decided to create a "radio-guided audio tour", according to Wikipedia it was difficult and costly, this new sound technology began to transform museum visitors' experiences and was soon part of the response to the Sixties' desire for cultural revolution. This system involved utilizing a shortwave radio broadcasting setup, wherein the amplified audio from a tape recorder acted as a transmission station, delivering commentary through a loop antenna affixed to the gallery's ceiling. Those users are a receiver could hear specific commentary while inside the loop. The debut of the initial random-access guide, named "INFORM," at the Louvre Museum in Paris in 1993 marked a pivotal moment in how museum-goers utilized mobile guides. Nowadays, museums and cultural institutions are progressively turning to smartphones to offer visitor guides, supplanting dedicated audio guides (Othman et al., 2013).

Museums and other cultural institutions are increasingly using smartphones as visitor guides, replacing dedicated audio guides. The utilization of digital technology display devices and their accompanying hardware empowers museums to provide visitors with the freedom to select their preferred learning environment. This enables users to explore museum exhibitions in a manner that aligns with their personal preferences. Additionally, employing such technology is believed to enhance museum experiences by facilitating self-directed exploration and discovery, departing from the traditional methods of guiding visitors based on predefined information (Othman et al., 2013).

Tourism has become the most cutting-edge sector in terms of technology integration. The growing number of tourists relying on mobile devices has led to a shift in how tourism products and services are delivered, with a strong focus on the mobile platform. Smartphone applications and similar technological advancements are now exerting a substantial influence on both the availability and desire for tourism services. The internet plays a crucial role in connecting and providing information to stakeholders at all stages of the travel experience – from planning and preparation to the actual trip and even after returning home. Because of online process of reservations, online payments options, tourist information searching sources, and experience sharing, consumer behaviour has shifted (Bran, 2021). According to Dimitrios Buhalis, regarding the past 75 years of technological development in the tourism industry, how the use of technology has increased day by day since the first computer to web 0.3, which transforms the tourism industry by using various technologies at hotels and in the travel business (Buhalis, 2019). The smart tourism ecosystem offers vast opportunities for technological advancements and the emergence of fresh business models. Additionally, it serves as a fertile ground for exploring novel interaction patterns and methods of generating value. Particularly in Asian regions, governments are actively promoting the establishment of smart tourism ecosystems. As a result, it has become imperative for scientific research to keep pace with and provide critical guidance for these developmental endeavours. (Gretzel, Werthner, et al., 2015).

The tourism sector is actively engaged in digital evolution, leading to labels such as tourism 4.0 or smart tourism. When focusing on the travel and tourism industry conceptually, "Tourism 4.0" primarily relates to the adoption of new hardware and

software technology tools. On the other hand, "smart tourism" emphasizes a sustainability-driven approach to utilizing the internet and information and communication technology. Its objective is to integrate technological, human, and social resources to promote sustainability principles, ultimately enhancing people's quality of life and enriching the tourist experience (Pencarelli, 2020). The swift embrace of mobile technologies by travellers, notably through smartphones and associated applications, is reshaping the entire tourism industry. Mobile technologies empower travellers to access personalized information conveniently, irrespective of their location or time. In practice, a mobile tourist guide can assist tourists in identifying potential attractions to visit, thus saving time and money that might otherwise be spent on searching and avoiding common inconveniences that were initially encountered in the early stages of tourism mobile guides, such as data limitations and usability concerns. In Brazil, the "Find Natal" app is utilized as a software program to manage smart city initiatives and enhance the tourist experience (Cacho et al., 2016).

The tourist guide system is extremely beneficial to tourists and improves self-guided tours for outdoor locations. The audio tour guide services also provide pedestrians, the disabled, and the elderly with safe and comfortable route and path guidance. which is a necessary component of an audio guide system (Kang et al., 2017). Tour guide systems focus on tourist attractions and offer services to tourists before, during, and after their trip (Vahdat-Nejad et al., 2020). "Mobile tourism" represents a recent trend in the tourism sector where mobile devices serve as electronic tour guides. While many of the essential technologies are currently accessible, there remain challenges related to ease of use, functionality, portability, design and the practical deployment of these devices that need to be resolved (Kenteris et al., 2009).

As reported by SME Times newspaper, in 2013, Mumbai, India witnessed the launch of the world's pioneering specialized and personalized tour guide mobile application, known as "Guiddoo." "Guiddoo" stands out as an innovative mobile app designed for both Android and iOS platforms, offering comprehensive and well-researched audio-visual guidance for renowned global landmarks and attractions, including iconic sites like the "Angkor Wat," "Statue of Liberty," "Colosseum," "Eiffel Tower," "Taj Mahal,"

as well as contemporary landmarks like the "Burj Khalifa," among others. What sets "Guiddoo" apart is its interactive nature, enabling users to share content directly on social media from within the app. Additionally, once downloaded on an Android or iPhone, "Guiddoo" operates without requiring an internet connection. This app not only serves as a response to but also a replacement for traditional audio guides and similar resources. However, As per media reports, in October 2019, the Ministry of Tourism of the Indian government introduced the inaugural government-backed smart tour guide application for tourist destinations in India.

2.2 App Usability Principles and App Quality Dimensions

According to Ko et al., the proliferation of smartphones has granted users access to a diverse array of applications akin to those available on traditional desktop computer systems. Mobile applications leveraging augmented reality (AR) technology utilize the user's location data. As novel assessment techniques for AR applications emerge, there is a need for enhancing user-friendliness and convenience. In their study, the author explores usability guidelines pertinent to the development and evaluation of AR-enabled smartphone apps. These usability principles have been categorized into five distinct groups:, user-interaction, user-cognitive, user-information user-support, , and user-usage, as detailed in the following table (Ko et al., 2013).

Table 2.1 Classification and Definitions of Usability Principles Groups

Group of user's usability principles	Definition
Users' information	The user-information category encompasses guidelines related to delivering information to users, covering aspects like, structured menu organization, visual information presentation and the use of familiar expressions.
Cognitive of users	The user-cognitive category comprises cognitive elements essential for helping users minimize memory burdens, respond as anticipated, and quickly grasp the workings of applications.

Support for the user's	The user-support category encompasses principles related to supporting users effectively, including offering valuable information, addressing concerns, personalization, minimizing errors.
Principles of interaction	The user-interaction category encompasses principles pertaining to the interaction between the user and the application, including the provision of feedback with minimal manipulation required.
Usage	The user-usage category involves principles related to practical application usage, including responding appropriately to the surrounding context and ensuring ease of use and termination of the applications.

Source (Ko et al., 2013).

Recent advancements in mobile technology have revolutionized how individuals engage with their environments. Current research has explored the potential of augmented reality (AR) to enhance the user experience. However, there has been limited investigation into users' acceptance of AR within the context of tourism. The technology acceptance model (TAM) stands as the most commonly employed theory for examining technology acceptance. Dieck and Jung have identified external factors relevant to the AR urban heritage tourism context. These factors include quality of system, quality of information, cost of usage, personal innovativeness, recommendations, risk, and facilitating conditions, all of which influence users' perceived ease of use and perceived usefulness when utilizing AR applications. Additionally, similar to the original TAM, the AR acceptance model posits that perceived ease of use not only affects perceived usefulness but also shapes users' attitudes toward adoption (tom Dieck & Jung, 2018a).

Among the key attributes of smart tourism technology, interactivity emerged as the most substantial factor contributing to tourists' memorable travel experiences. The diverse interactive elements of smart tourism technology implemented at various destinations likely played a pivotal role in engaging tourists more actively in tourism activities, providing them with comprehensive event and activity information, creating digital

social spaces, and enabling them to share their unique and unforgettable travel experiences with others (Jeong & Shin, 2020).

Briciu and Briciu's study investigates the virtual exploration of 'Smart Brasov' in Romania through a cultural tourism mobile application. Augmented Reality (AR) and Virtual Reality (VR) technologies offer valuable tools for the preservation of cultural heritage sites. Nevertheless, in the development of virtual tourism experiences, there are considerations related to the conservation and management of cultural heritage. Hence, destination managers and cultural and administrative representatives must strike a careful balance between preserving heritage integrity and ensuring the accuracy of information or historical facts. Briciu's research introduces a four-stage conceptual model designed to guide the application of AR and VR technologies. This model illustrates how these immersive technologies can be effectively employed in heritage preservation within the tourism context, shaping the presentation of cultural heritage in tourism experiences (Briciu & Briciu, 2020).

According to Barnett et al. understanding technology adoption and use is critical in the field of information systems. Several conceptual models attempt to explain how and why people use technology. In the context of a web-based classroom technology system, using perceived and effective technology measures, performance expectancy, effort expectations, and social impact on the use of technology, there are direct relationships between personality and technological characteristic in five factor model (Barnett et al., 2015).

Ko et al. illustrate, AR is has been made to provide information about tourist attractions during the sight-seeing tour. Based on active tourist usage, its use will enhance tourist satisfaction. Three factors have been recognized as drivers that motivate tourists to actively engage with Augmented Reality (AR). The first factor is "technology readiness," which refers to a tourist's mental preparedness to embrace a particular technology. The second factor pertains to the visual element of AR. The third factor to take into account is the situational context. Technology readiness was found to predict perceived usefulness. Furthermore, perceived ease of use was influenced by visual appeal and facilitating conditions. Perceived ease of use had an impact on perceived

usefulness. Ultimately, both perceived usefulness and ease of use influenced the attitude toward AR and the intention to both use AR and visit a destination (Ko et al., 2019).

Lu et al. conducted a study to examine the factors impacting the adoption of travel apps by tourists who visit rural tourism destinations in China. They employed a combination of the technology adoption model, innovation diffusion theory, and social cognitive theory in their research. Their findings revealed that perceived usefulness, perceived ease of use, and compatibility play crucial roles as predictors of the intention to use travel apps. Additionally, it was observed that self-efficacy indirectly influences the intention to use travel apps through the mediation of outcome expectations (Lu et al., 2015).

Daud et al discover that, the clearly organised information provides a positive user experience, allowing them to feel unique and relevant to what/where they are looking for. The most important factor in sustaining engagement is the visible and invisible interaction between the application and the users. A positive user experience is essential for tourists, as it influences user acceptance and satisfaction. The application provides all the information they require, has many user-friendly features, and can be used by users of all ages with ease. The positive travel experience provided by the "iSuyyah" application in Malaysia leads to increased tourist satisfaction and user application engagement (Daud et al., 2021).

Chuang conducted a study focusing on mobile guide app factors like, PU mobility, use context of use, and intention of purchase. The results indicated that travellers place high importance on mobile guide services, especially when they make use of app features like defining the purpose of their trip, tour planning, and accessing supplementary information. In essence, when mobile travel app providers deliver excellent service experiences that align with travellers' needs and expectations, going beyond mere functional services, travellers tend to turn these services into a meaningful and memorable experience. (Chuang, 2020). There are five aspects of mobile service quality to take into account: availability, compatibility with mobile devices, user-friendliness, provision of entertainment services, and perceived risk. These dimensions are found to have a positive impact on satisfaction, aligning with the established relationship in service quality literature between service quality and satisfaction. Among these

dimensions, ease of use and availability appear to be the most critical factors influencing overall satisfaction (Özer et al., 2013). Perceived convenience and the quality of the app system both contribute positively to the perceived usefulness. This suggests that when users perceive a high level of overall operational quality and find it easy to use various functions within the system, they tend to view the system as more valuable. The most substantial factor influencing users' perceptions of the system's functionality is the quality of the system itself (C. Chen & Tsai, 2017).

Table 2.2 Few Studies with Different App Quality Dimensions

Author(s)	**Area**	**Theory / model used**	**Construct / Dimensions**	**Finding**
Lai, 2013.	Mobile tour guide in Macau	UTAUT	Information content, amusement value, expected performance, ease of use, social persuasion, enabling circumstances, and behavioural intention.	This study also identifies other predictors of intent to adopt technologies which are based on the app.
Kaushik et al., 2015	Self-service hotel technology adoption in India	Hypothesis base conceptual model	Perceived Ease of Use, Perceived Usefulness, Need for Interaction, Perceived Risk, Attitude, Intention to adopt, Trust, subjective norms	The TAM model has the potential to investigate attitude and intention constructs and their predictors that influence consumer

				adoption of various smart tourism technologies.
Miyoung Jeong and Hyejo Hailey Shin, 2019.	Technology at Smart Destinations and Their Behaviour Intentions Boston, Chicago, NewYork City, San Francisco, and Seattle	Effect of technology in tourism on visitors experience.	Accessibility, Informativeness, Interactivity, Personalization, Memorable experience, Satisfaction, Behaviour Intention	The availability and functionality of smart tourism technology to increase the generalizability at other tourist places for extraordinary experience.
Ali et al., 2021	Smartphone travel apps in Florida, USA.	Smart phone app quality base Theoretical model	Behavioural intentions, Information quality, Service quality, Smartphone app love, Smartphone app satisfaction, System quality, User engagement	The updated success model proposes that smartphone quality of app, as measured by quality of system and quality of information, and quality of service is important for travel app.

Emel Yarimoglu and Tugrul Gunay, 2019.	Turkish customers' intentions to visit green hotels in Turkey and TBP	The research model is rooted in Ajzen's (1985) Behaviour theory as developed by Fishben and Ajzen (1975).	Intention to visit, Personal sentiments, social influences, Willingness to invest extra, Perceived control, Engagement in environmentally-friendly activities, General perception, Contentment, and Commitment.	The research findings provided support for applying the expanded Theory of Planned Behaviour within the context of environmentally-friendly hotels.
Erni Widarti, et al.,2020	Guidelines for Mobile App Design in the Heritage Tourism of Yogyakarta, West Java, and Bali, Indonesia.	User-centered design (UCD)	Usefulness, easy to use , Ease to learn, satisfaction	The successful outcome of this study is reflected in the design of tour guide services. The design of these services was shaped in accordance with user expectations and aligned with the proposed

				application design.
A. Vinodan and S. Meera 2019.	Mobile Tourism (M-tourism) in India: Examining Symbolic vs. Intentional Adoption	Adoption model	Performance expectation, Perceived efforts, Technology specific, Facilitation, Country specific, Personal centric	The research pinpointed 29 factors that exert an influence on the symbolic adoption of M-tourism.
Pedro Palos-Sanchez etal.,2020.	Tourism applications' quality and user experience	Unified Theory of Acceptance and Use of Technology 2 (UTAUT2)	Behavioural intention, Effort expectancy, facilitating conditions, App user experience, Hedonic motivation, Performance expectancy, App quality, social influence, Trust, Use behaviour	Gaining a more profound insight into users' considerations when deciding whether to download a mobile tourism app and how they choose to utilize it during their travel.

Source: literature review by author

With reference to table 2.2, a few authors conducted research using various theories and models, as well as various variables for app acceptance studies. Based on their research, they have reached a conclusion. However, it has been discovered that some app

qualities, such as mobile support and online offline mode functionality, have not been studied. Savings time. App image, audio, and information quality should be investigated in the context of Indian app users.

2.2.1 What is Mobile App Quality?

According to Instabug blog performance, stability, testing, and usability are all factors that influence app quality, and they all relate to the end-user experience. Considerations for performance and stability include: Is it loading quickly enough? Is the battery being drained? Is it crashing all the time? Thorough testing ensures that an app works properly, is stable, and is usable. Finally, high-quality apps must be easy to use. Regardless of the app's ultimate function, users must be able to interact with it with ease. There are several app qualities define by different researcher as below.

Table 2.3 App Qualities and Definition

App quality	Definition	Author
Defaults	The initial setup should be straightforward for users to navigate. Furthermore, there should be a clearly defined frame indicating the input space and instances relevant to the input format	(Ko et al., 2013).
Enjoyment	To provide users with exciting experiences, an aesthetic design that includes colours should be used.	
App familiarity	Use of multiple language in the app will familiar with the app.	
Hierarchy	When there's a substantial amount of information in the app, it should be organized in stages or phases.	

Multi-modality	When delivering information, it's advisable to offer multiple modalities, including both sound and visual displays.	
Visibility	The information within the app should be easily visible.	
App consistency	To prevent confusion, it's essential to maintain consistency in the use of familiar terms and interfaces over time.	
Use in Learnability	The app's functionalities and features should be both efficient and easy for users to grasp	
Predictability	The functions and features of the application should be efficient and user-friendly, making it easy for users to learn and use them effectively.	
User control	The system should convey a sense of user agency, where users feel in control of the system, and the system responds to their actions.	
Feedback	During the process system should provide necessary input to system.	
Low physical effort	It should reduce the effort required to operate the application as well as user fatigue.	
Responsiveness	It should respond quickly to user actions.	
Navigation	When performing their tasks, users should be able to freely navigate within the application.	
Information quality	The importance of collecting timely, relevant, and engaging information.	(tom Dieck & Jung, 2018b).
System Quality	System quality is known as quality of Language, System accuracy, multi-language	

	support quality of navigation quality of design and based on user in interest	
Facilitating condition	Hardware availability is a facilitating condition. Battery life should not be shortened.	
Functionality	In the context of Augmented Reality (AR), functionality encompasses features like navigation, saving and filtering information, and supporting multiple languages.	(Han et al., 2018b).
Performance Expectancy	The extent to which utilizing the app will enhance users' travel-related experiences.	(Kourouthanassis et al., 2015).
Effort expectancy	What kind of effort required to use technology.	

Source: literature review by author

2.3 Theory Used for Acceptance of Technology and Related Studies

According to Maranguni's review of the literature, from 1986 to 2013, The issue of whether individuals embrace or decline technology has been a subject of ongoing inquiry for several decades. Davis' Technology Acceptance Model (TAM) stands as a prominent framework in the examination of this phenomenon, with continuous advancements uncovering novel factors that exert a notable impact on the model's fundamental variables. The TAM model has played a pivotal role in enhancing the predictive accuracy of TAM itself (Marangunić & Granić, 2015). The evolution of the TAM model in this research, stemming from a comprehensive analysis of 101 articles published from 1986 to 2003, unveils numerous valuable insights and provides thoughtful projections for the future direction of TAM-related studies (Y. Lee et al., 2003).

Mobile technology has transformed how people interact with their surroundings. TAM model used to examine the adoption of smart galas- AR based technology at a cultural heritage site in Malaysia (Obeidy et al., 2017). This model is useful for technology adoption in tourism because it is based on a study of user acceptance of information and communication technology in terms of PEOU and PU (Davis, 1989). According to Kaushik k., adoption of smart tourism technology in hospitality and tourism industry

examine by technology acceptance model, identification of trust, past experience, of tourist intention about technology in hotel industry tourist experience during the check-in the hotel about usefulness of technology was full in the research hospitality and tourism in this research author has developed hypothesis based conceptual model and TAM model has potential to examine (Kaushik et al., 2015).Technology acceptance model used for self-service technology in tourism industry by (Oh et al., 2016).

The Theory of Planned Behaviour, introduced by Ajzen in 1985, was designed to provide a structured framework for comprehending intricate human behaviours. In past research, this theory has been employed to anticipate intentions. Furthermore, the author has proposed various alternative theories to elucidate attitudes and behaviours, applying them within the hotel industry (Yarimoglu & Gunay, 2020). The author suggested develop different types of samples from different clusters, using different theories to explain attitude and behaviour, and applying them to the hotel industry in the future (Conner~ & Armitage, 1988). The study of the relationship of intention to behaviour may provide a useful way to develop theory of plan behaviour in relation to understanding how attitude influence's goal achievement. The author suggested that further researcher demonstration of casual relationship among the variable's theory of plan behaviour any expiations are clearly required. According to Rogers Banking, ATMs are the most prominent example of technology adoption with the theory of diffusion of innovation (Rogers,1995). UTAUT is employed to examine the adoption and utilization of technology within the consumer context (Venkatesh et al.,2018). As per Obeidy's research, several external factors such as quality of information, readiness of technology, facilitating conditions and visual appeal play a pivotal role in influencing visitors' perceived benefits, attitude, and intention to use. The author suggests that PU and PEOU have a positive impact on attitude, subsequently influencing the intention to use and, consequently, actual usage behaviour and the intention to visit a particular destination (Obeidy et al., 2017).

Referring to Ulker-Demirel's systematic literature review of the Theory of Planned Behavior within the domain of tourism, leisure, and hospitality management research. Only three studies carried out to research generation base on leisure and hospitality management research context. However still there are some gaps that need

to be address. Future study may also draw from field work to make solid contribution to existing knowledge, tourism practitioners should guide with an informed understanding of tourism behaviour to be able to develop their own approaches (Ulker-Demirel & Ciftci, 2020).

Marangunic's literature review, conducted from 1986 to 2013, discusses the Technology Acceptance Model (TAM) and its significance in comprehending how individuals accept or reject technology. The author identifies that TAM is rooted in psychological theories such as the Theory of Planned Behaviour and the Theory of Reasoned Action. TAM is considered a crucial model for elucidating the predictors of human behaviour regarding technology adoption. Numerous studies have reaffirmed the model's robustness and its applicability across various technological contexts. However, for future research, Marangunic suggests exploring several areas of inquiry. First, investigating the moderating influence of individual variables on technology acceptance is recommended. Additionally, the author proposes the incorporation of supplementary factors into the TAM framework. Furthermore, examining actual usage patterns and their relationship with objective outcome measures is advised. Lastly, Marangunic suggests focusing research efforts on the older adult demographic as a specific target group for studying technology acceptance. Given the increasing reliance on technology, particularly in information and communication technology, both in professional and personal spheres, the field of technology acceptance is likely to remain a subject of considerable interest for many years to come (Marangunić & Granić, 2015).

In the research conducted by Chuang C, it was found that travellers' PU of mobile app guide services has a positive influence on their usage context and purchase intentions. Additionally, this perception of usefulness plays a mediating role in the relationships between various factors: 1) Marketing for experimental and usage context, 2) Intention of purchase and marketing, 3) Context of users 4 Intentions of purchase and mobility. This indicates that when travellers engage with mobile app guide services, their assessments and sentiments regarding these services significantly affect their level of acceptance and usage context. (Chuang, 2020). With reference to study done by Kou et al on mobile application acceptance for identifying tourism destination by travellers. An integrative approach suggested, future research need to determine how PU and PEOU

affect the relationships between tourism app and intention to adopt apps and other constructs. The study focus how customer adopt mobile app and use of mobile app used motivate to travel and need to find out satisfaction of mobile app users (T. S. Kuo et al., 2019). The findings regarding the intention to adopt app-based hospitality and tourism technology provide a deeper understanding of the factors at play within the traveler's acceptance model for such technology (Lai, 2015). Quality dimension on customer satisfaction in use of website is need to explore information quality play important role in satisfaction of user same study can be apply with different methodology for customer satisfaction (Lin, 2007). personality five factors model and acceptance of technology model is useful to investigate intention to use business intelligence study provide understating relationship between personality and intention (Harb & Alhayajneh, 2019). Additional research should explore the intermediary steps that link personality traits with usage behaviour and also investigate factors that can influence these connections. (Barnett et al., 2015).

Dorcic highlights recent trends in the advancement of tourism mobile apps, emphasizing the incorporation of visual technologies like augmented reality and gamification techniques. These innovations introduce new dimensions to virtual reality and enhance the appeal of specific destinations. Furthermore, the integration of GPS and location-based tracking in apps simplifies travellers' experiences while providing valuable data for service providers (Dorcic et al., 2019).

Jimenez's findings corroborate a direct and substantial connection between the quality of a website and users' attitudes toward using the website. Furthermore, the inclination to participate in online experiences and the website's perceived attitude serve as partial mediators in the connection between the destination website's quality and users' readiness to engage in online co-creation activities. In future research, it is advisable to include a range of different response times as a component of the study (Jiménez-Barreto & Campo-Martínez, 2018).

Perceived ease of use is defined as the extent to which an individual perceives that utilizing a specific system would require minimal effort, while perceived usefulness is the degree to which an individual believes that using a particular system would improve their job performance. And these variable are use in TAM research (Lescevica et al.,

2013). Deng et al summarise, firstly, some studies alter the original instrument and/or add new dependent variables. Secondly, the model is sometimes applied to general computing facilities rather than to a specific application. Thirdly, rather than intention to use, some studies assess self-reported and objective system usage. Fourth, many of the studies do not use "initial exposure" data, implying that the findings do not provide prior knowledge (Deng et al., 2005).

2.4 The Unified Theory of Acceptance and Use of Technology (UTAUT)

Venkatesh et al. pointed out that the Unified Theory of Acceptance and Use of Technology (UTAUT) has found widespread application in various fields, including information systems (IS). This is evident from the considerable number of citations to the initial paper that introduced the theory. There is a tremendous amount of research being conducted on technology acceptance, but much of it is "wasted" because it does not provide a sufficient theoretical contribution. Many of these papers make no significant empirical contribution Venkatesh et al. conducted an extensive review of UTAUT literature spanning from September 2003 to December 2014 with the aim of comprehending the latest advancements in technology acceptance and utilization research. In their classification, they categorize the current UTAUT extensions into four distinct types: mechanisms of new exogenous, mechanisms of new endogenous, moderation mechanisms, and mechanisms new endogenous (Venkatesh et al., 2016).

In one or more of the individual models tested by Venkatesh, only seven variables appeared to be important to direct determinants of use of technology or intention to use. Venkatesh et al. put forward a hypothesis stating that four of these constructs will serve as significant and direct factors influencing user acceptance and usage behavior. These four constructs are expected performance, expectancy of effort, facilitating conditions and social influence. As will be discussed further below, attitudes toward technology, anxiety and self-efficacy, are not thought to be direct predictors of intention. However, the role of the key moderator is important in UTAUT (Venkatesh et al., 2012).

Williams et al. noted that many academic journals and conferences worldwide publish research based on the Unified Theory of Acceptance and Use of Technology (UTAUT), with a predominant contributor base from the United States, as expected. Consequently,

there are abundant scope for researchers from diverse regions to initiate original studies related to UTAUT research within specific cultural and contextual frameworks. Although UTAUT research is still in its nascent stages and lacks clearly defined areas of maturity, it shows rapid growth. Over time, UTAUT has evolved, undergone testing, and witnessed enhancements. Researchers have employed existing models in conjunction with UTAUT, introduced new construct and find out relationship among their component how they are applicable and fit for research however researchers can used opportunity available in field. Do a study with active participation for advancement of field (Williams et al., 2015).

2.5 Travel App Engagement

Customer engagement arises from the intrinsic motivation of app users to actively interact and collaborate with fellow community members. This perspective considers customer engagement from a behavioural standpoint (Tian et al., 2021). Customer engagement behaviours encompass the non-purchase actions taken by customers towards a brand or company, driven by various motivations. These behaviours encompass a broad spectrum of activities, including word-of-mouth marketing, making recommendations, assisting fellow customers, engaging in blogging, and composing reviews (van Doorn et al., 2010).

The study examined the connections with app which work on smartphone affection, engagement, satisfaction, and behavioural intentions. The research revealed that both engagement and satisfaction are key factors contributing to the development of affection for smartphone apps. Satisfaction also holds significance in shaping behavioural intentions. Additionally, there is positive substantial impact has been observe on behavioural intention with affection and users engagement with the app which work on smart devices (Ali et al., 2021).

Mobile app engagement saw positive influences from factors such as convenience of time, compatibility and interactivity. These factors, in turn, fostered strong relationship commitment and connections with the app as an extension of one's personal brand. Additionally, informative and the effects convenience of time, interactivity, and

compatibility on mobile app engagement were moderated by experiential mobile apps (S. Kim & Baek, 2018).

Regarding mobile travel app engagement, customers exhibit different influences based on travel attributes. As per Tian et al.'s research, certain findings emerge: ease of use exerts a more substantial impact on female respondents' engagement with mobile travel apps compared to male respondents. Compatibility has a more pronounced effect on customer engagement among individuals with higher levels of education than those with less education. Additionally, ease of use plays a more prominent role in engaging low-income respondents with mobile travel apps compared to their more affluent counterparts (Tian et al., 2021).

2.6 App Users Experience

“Trip My Way App” was a private sector app, but it is now free for users. Mahajan et al. investigated positive and negative app user reviews in the book chapter. Several natural exclamation points customer reviews such as "good, great, awesome, experience too good, pleasant app superb, nice, really great, best, wow, very good, fall in love, wonderful, like this app, excellent, " confirmed what excellent experience app users had about app quality. “Trip My Way App” and “Audio Odigos App” both are smart tour guide app which provide authentic information gathered from government sources and recorded by government-approved tour guides in the area. Such tour apps provide tourists with a memorable experience at cultural heritage sites (Mahajan et al., 2021).

As reported by Bellio smartphone applications are now meeting the needs that guidebooks and tour guides once filled. Digital guidebooks, walking tour by using app audio guides are allowing visitors to explore city tour Rome , Amsterdam, Paris more independently. The experience of a city can be greatly enhanced by tour guides, but walking tour apps do away with the crowd and human guide of a tour, allowing the visitor to explore the city more independently with just a digital intermediary. With the aid of a digital companion, tourists are taking matters into their own hands and it is crucial to examine and comprehend how they view the city (Bellio, 2018).

According to Jeong & Shin, personalization, interaction, and information these three key aspects of smart tourism technology. Interactivity, which has been the most

important factor in creating a memorable travel experience for visitors. The interactive features of smart tourism technology at the destinations may have contributed to this by encouraging to engaging visitors in tourism activities involves providing them with comprehensive event information, ensuring they are well-informed about all available events and activities, fostering social interaction within a digital environment, and enabling them to easily share their unique and memorable travel experiences with others. This technologically enhanced experience of travel may result in a high level of satisfaction with the use of the technology and a stronger desire to return to the destinations. The ability to customise such technology was another important element that improved visitors' experiences at the tourist places (Jeong & Shin, 2019).

As stated by Han et al, for travel and tourism public transportation is important, when discussing the AR applications in urban destinations. On the other hand, it was asserted that a while using offline functions would be work appropriately for AR travel app because users' limited access to information was seen as a determinant of users. Although many urban areas have started offering free Wi-Fi to visitors, focus group results revealed that visitors were not well-informed or constantly moving, making it difficult to maintain an Internet connection. However, further research is necessary because using offline app which was large in size and possibly slower loading times that would impact the user experience (Han et al., 2018b).

Dube and Helkkula's study emphasizes that both direct and indirect use experiences are integral components of the all-encompassing phenomenological service experience. These indirect experiences can manifest when customers encounter other customers' feedback or come across different forms of communication like advertising. For instance, a person might form a positive view of a fashion clothing brand after hearing a friend speak highly of the brand's app, even if they haven't personally used the app. In this scenario, the individual's evaluation of the brand is influenced by their friend's app reviews. Both direct and indirect use experiences are subjective and rooted in individual interpretations, and they are both linked to the app or the user. Furthermore, both contribute to the collaborative process of value creation within app usage. While direct use experiences have garnered more attention, it's important to acknowledge that both

direct and indirect app use experiences play a role in shaping value co-creation (Dube & Helkkula, 2015).

2.7 Adoption of Travel Apps

Kenteris et al. investigated the improvement in experience of travel websites by introducing a tool on tourism websites that operates on a "web-to-mobile" model. This tool enables the transfer for adapt personalized tourism web content for hosting on users' mobile devices as a dedicated mobile application. Once these applications are installed on mobile devices, users can access tailored multimedia content without the necessity of a continuous network connection (Kenteris et al., 2011).

Puckett provides an elaboration, stating that previous research underscores the significance of technological competence, which includes the capacity to adapt to technological advancements by acquiring proficiency in new technologies. This competence has significant implications for addressing disparities. Nonetheless, there is currently no established definition or measurement of the specific actions individuals undertake to acquire new technological skills, and there is a lack of empirical evidence linking these actions to the issue of inequality (Puckett, 2020). It is required to conduct research that substantially contributes to our understanding of individual technology acceptance and usage. (Tamilmani et al., 2021). Academic research on consumers' intentions to embrace technological innovations related to travel apps is currently limited (Lu et al., 2015).

Kaushik examine that the hospitality industry is expanding with an ever-changing technology adoption process, and novel opportunities for new technology adoption are constantly being explored. Several research perspectives have offered various adoption models for the implementation of such technologies over the years.

While trust has a more pronounced influence on tourists' attitudes, both trust and subjective norm exert a significant impact on tourists' behavioural intentions to adopt new technologies (Kaushik et al., 2015).

Jeong and Shin conducted a study focusing on enhancing the tourist experience through the dissemination of pertinent information, including city history via city guide applications and real-time traffic updates. Smart tourist technology has played a pivotal role in aiding the tourism industry in formulating efficacious marketing strategies to allure customers to smart tourism destinations and deliver distinctive and memorable tourist experiences (Jeong & Shin, 2020).

Ho et al. validate the unified theory of acceptance and use of technology dimensions as links between consumption values and travel itinerary adoption. Study confirms that hedonic and utilitarian values are the most influential factors in consumers' decision to use an itinerary. These findings are consistent with other studies on technology adoption. As a result, this integrative model explains the creation of smart tourism apps. As more travellers choose to use these types of apps, this theoretical framework explains how they can be used for better travel planning (Ho et al., 2021).

Leon discusses the significance of functionality and user interface of a mobile application, highlighting that among millennials, app functionality attributes hold greater importance. The user interface plays a crucial role in facilitating the functionality of a service mobile app. Without a user-friendly interface, millennials' willingness to use service mobile apps diminishes. Consequently, when app designers deliberate on prioritizing user ease of use and usefulness, functionality emerges as the primary consideration. However, it's essential that the user interface meets a certain level of adequacy for the mobile app to be considered usable (Leon, 2018).

Castaneda et al., study focus on the acceptance of tourism apps and addresses the overall range of activities performed by the visitor during his or her stay. In terms of the study's main findings, the study identifies two sets of variables. On the one hand, there are variables that have a direct impact on tourist app use and recommendation behaviours (Castañeda et al., 2019).

Mahardika et al. investigated the current understanding of two hindrances in the adoption of new technology, namely "experience" and "facilitating conditions," and their impact on the predictive capacity of behavioural expectations and intentions. Their findings confirm that when obstacles impede the adoption of new technology, the

predictive power of behavioural intentions is affected negatively. However, irrespective of whether hindrances to new technology adoption exist or not, the predictive capability of behavioural expectations remains consistent (Mahardika et al., 2019).

Expected performance from the smartphone apps, money saving features, risk factors and social influence, trust on smart phone, and habit to use all has significant impact on adoption of smartphone app. that among these constructs, expected performance emerges as the most influential determinant, followed by price-saving orientation and social influence. However, there is no significant relationship between behavioural intentions and effort required to use , hedonic motivation or facilitating conditions. (Gupta et al., 2018).

Dickinson et al. explore how top tourist attractions and destinations are increasingly embracing smartphone app technology. Their review of apps highlights a wide range of functionalities, ranging from basic systems that provide information through small websites to more advanced tools that incorporate context awareness. These apps cater to various facets of the travel experience, offering various applications made for travel field. Such advancement in travel is depending on the the technology will be implimented by the stakeholder in tourism field (Dickinson et al., 2014).

According to Sánchez-torres & Argila-irurita to analyse travel app adoption more thoroughly and to determine whether, theoretically, A different model may be better suited to scrutinize the variables that have been explored in previous studies, including factors like facilitating conditions and innovativeness. Future research in the field of tourism applications should consider employing such a model for a more comprehensive analysis. The future of mobile telephony and the Internet of Things, as well as the use of other APP-related technologies, are going to become future trends in the travel industry (Sánchez-torres & Argila-irurita, 2021).

2.8 Intention to Use App

Lu et al.'s examination of three app characteristics PEOU, PU, and compatibility established their substantial impact on the inclination to use apps. This substantiates the appropriateness of the “Technology Acceptance Model” (TAM) and “Innovation

Diffusion Theory" (IDT) for elucidating the intention to employ apps within the domain of rural tourism (Lu et al., 2015).

Pai et al. conducted a study on the relationship between travel experiences and the likelihood of tourists revisiting a destination. They discovered that positive factors affecting this likelihood included the level of enjoyment during travel, the confidence gained from the trip, and overall satisfaction with the tourism experience. Interestingly, their research revealed that the most influential factor influencing tourists' intention to return was the confidence gained from the trip, followed by their satisfaction with the travel experience and their level of enjoyment during the journey (Pai et al., 2021).

Choi et al. explore the determinants of users' intentions to persist in using mobile applications designed for travel-related functions. As tourists have already embraced new technologies, the research emphasis must transition from the initial "adoption" phase to the more significant "ongoing usage" phase. Mobile applications are commonly downloaded onto portable devices but are frequently utilized only once. Within the first month of installation, less than 20% of users revisit the app. Therefore, there is a crucial need to comprehend the user experience and delve into the factors that affect users' intentions to continue using these apps (Choi et al., 2018). The level of user engagement with travel apps on smartphones is notably shaped by the quality of the system, information, and services provided. Additionally, it is worth noting that user engagement has a positive and substantial influence on the satisfaction, affection, and behavioural intent toward smartphone apps (Ali et al., 2021). Nevertheless, Tian et al., elaborate, there has been a scarcity of studies thus far that delve into the factors influencing and consequences of customer engagement with mobile travel apps. Most of the existing research on mobile travel apps has concentrated on aspects like app adoption and user retention. Notably, the three dimensions related to customer engagement with mobile travel apps, namely ease of use, compatibility, and attractiveness, play a substantial role as precursors to purchase intention (Tian et al., 2021).

Tak and Gupta suggest that for a travel app to be successful, it should establish enduring partnerships with various entities such as banks, taxi services, hotels, and digital wallets. The app's effectiveness in attracting customers is enhanced by its array of options and

enticing offers. Regarding information presentation, the travel app must deliver precise, real-time, and pertinent details concerning vacation packages, flights, accommodations, and more. The inclusion of customer reviews and images serves to heighten user engagement and their willingness to use the travel app. Ensuring a smooth and intuitive navigation experience for users is imperative, and visual appeal plays a significant role in capturing the consumer's attention. Factors like font size and colour combinations are crucial elements for users. Furthermore, the image quality of hotel or destination visuals posted by the travel app contributes significantly to the user's interest. Importantly, consumer engagement ultimately influences their intentions to make use of the travel mobile app. (Tak & Gupta, 2021b).

Xu et al. A study examined the separate impacts of three different types of perceived benefits on the future usage intentions of Chinese consumers in the context of tourism mobile applications. With the increasing significance and business opportunities associated with tourism mobile apps, the research outcomes demonstrated that the perception of time-saving had a direct influence on consumers' intentions to persist in using the app but did not affect their actual usage behaviour. Conversely, the perception of money-saving had a direct impact on user behaviour but did not influence their intentions. In contrast, the perception of convenience was found to impact both intentions and behaviour, and it exhibited a notably more substantial overall effect on user behaviour compared to time-saving and money-saving perceptions (Xu et al., 2019).

Zhuang and colleagues aim to ascertain tourists' inclination to utilize augmented reality (AR) technology and delve into how millennials may moderate the connection between subjective norms and tourists' inclination to employ AR technology. They have identified the Technology Acceptance Model (TAM) as a pivotal framework in augmenting tourists' readiness to engage with AR technology applications within museum settings. Their investigation has unveiled that users' perceptions concerning the utility and user-friendliness of technology play a pivotal role in shaping their adoption and overall attitudes toward technology (Zhuang et al., 2021).

In the model put forth by Tom Dieck and Jung, the perception of how easy it is to use and how useful augmented reality (AR) applications are is influenced by several factors,

including the quality of information, system performance, the associated costs, recommendations, individual innovativeness, perceived risks, and facilitating conditions. Moreover, similar to the original Technology Acceptance Model (TAM), the AR acceptance model suggests that the perception of ease of use not only directly affects the perception of usefulness but also shapes one's attitude toward using AR applications (tom Dieck & Jung, 2018b).

Kourouthanassis et al examine, Mobile Argument Reality (MAR) travel guide, with a focus on the evaluation of systems by tourists visiting a Greek island, Corfu, Authors conducted a field study to gauge tourists' willingness to use the MAR tourist guide, which was contingent on their perceptions of CorfuAR's performance, usability, and the overall experiential impact it offered. Given that MAR technologies have reached a level of maturity where they can deliver valuable and effective services, it becomes crucial to investigate what potential users expect and demand to ensure widespread social acceptance of MAR services.(Kourouthanassis et al., 2015).

2.9 Over View of Indian Smart Tour Guide App

As per the Ibef portal, digital tourism refers to an online platform designed to enhance the overall travel experiences of tourists by providing digital support both before, during, and after their journey. These services encompass a wide range of offerings, including recommendations for popular attractions to visit in order to plan an itinerary, as well as services like real-time tour guidance through mobile applications. Travel management websites, which have become the global standard in the tourism industry for comparing prices from various companies, making and managing bookings, serve as a prime example of this trend. The online travel sector in India is rapidly evolving, owing to the advent of the internet and the emergence of augmented reality (AR), with an increasing number of Indians turning to online travel services.

Government of India has taken great initiative by launching Adopt Heritage "Apni Dharohar Apni Pehchan project" according to this project in 2020, The Archaeological Survey of India (ASI) is responsible for the upkeep of 3,691 ancient monuments and archaeological sites, which include 22 cultural world heritage sites. Additionally, there

are approximately 4,000 state-protected monuments and over 30,000 unprotected sites scattered across the country. India boasts 655 wildlife refuges and national parks, 131 marine protected areas, 18 biosphere reserves, and 8 natural and mixed world heritage sites. This extensive array not only showcases India's immense wealth, diversity, and variety but also underscores its incredible potential.

These historical monuments and natural areas play a pivotal role in India's tourism strategy, serving as magnets to attract both domestic and international visitors. To fully tap into the potential of these monuments and locations, it is imperative to provide essential facilities and amenities such as safety and security for tourists. Moreover, enabling adaptive reuse to create new experiences, including features like illumination and night viewing facilities, becomes crucial in enhancing the appeal of these sites. and so on. Providing Multilingual Audio-Guide App is one of the important parts of this project.

In the current era, it's challenging to envision anyone's life without technology, and this holds true for the Indian hospitality industry as well. Numerous significant technological advancements have significantly transformed the way the hospitality sector operates. These innovations are evident in various aspects, such as the convenience of swift check-ins facilitated through an ambassador equipped with a dedicated iPad, or the introduction of the "iConcierge app" available on both Android and iOS platforms. Some establishments even provide guests with iPads loaded with the "iKnow Concierge software" in six different languages, offering a range of services. For instance, the Hotel 1000 in Seattle has implemented Hotspot rooms featuring heat-detecting body sensors that serve as occupancy detectors. These new technological breakthroughs and advancements are instrumental in ensuring that guests have an enjoyable and seamless stay (Gunjan M Sanjeev, 2016).

V. Sabarish explained, travel and tourism is one of India's most important business sectors. There are various places to visit in India due to its vast diversity, heritage, and cultures. The overarching objective is to foster and advance tourism in India, bolster the nation's status as a global tourist hotspot, and enhance and diversify the existing tourism offerings, all with the aim of stimulating job growth and economic development. To achieve this, there is a pressing need to harness technology to attract and facilitate the

travel experiences of the younger generation. In particular, there is a demand for a comprehensive mobile application that caters to the entire travel journey, eliminating the necessity for multiple apps for distinct services. A versatile mobile travel guide application with an array of functionalities is envisioned, encompassing all essential features to aid and enhance the experiences of tourists throughout their entire trip.(V & Sabarish, 2021).

As described by Jitendra et al., a smart travel guide is essentially a mobile application that grants mobile users access to tourism guidance information at their convenience, regardless of their location. Within this smart travel guide, users can access comprehensive information about various attractions, including text, images, and videos. This information is provided in a location-based manner, allowing users to either browse or query attraction details via a map. Users also have the capability to adjust the search radius based on the distance between their current location and the desired view spots, enabling them to discover nearby attractions easily (Jinendra et al., 2012).

In October 2019, the Tourism Ministry of Indian government launched "Audio Odigos app," an audio guide service encompassing 12 historical sites across India, as reported by Outlook India web portal. This audio guide service offers tourists access to authenticated content provided by the Government of India, along with visual aids and voice-over support. Yogendra Tripathi, the Secretary of Tourism for the Government of India, mentioned that "Audio Odigos" aims to enhance the tourist experience, providing them with profound insights into Indian culture and heritage. The "Audio Odigos" app includes a site map for convenient navigation during the tour, and it offers listeners various historical narratives, including concise summaries, detailed accounts, and podcasts. Users have the flexibility to choose their preferred language for the audio content. "Audio Odigos" is now accessible for download on both Android and iOS devices, making it readily available for tourists to use at a range of destinations, including in states of Gujarat, Madhya Pradesh, Rajasthan, New Delhi, Uttar Pradesh, Tamil Nadu, Bihar According to “Digi Tour” app modern, technology tells tourists about history. Digitour mobile app offers an immersive audio-visual guided tour of historical monuments, leaving no stone unturned. Users can learn about the monument by taking a 360-degree panoramic tour, using virtual reality or augmented reality, and

listening to audio content in multiple languages about the architecture, history, and iconography of each sculpture. Digitour reimagined travel as a learning experience.

The Global Vipassana Pagoda app is only available for visitors to one location near Mumbai in Maharashtra. Users can use this app in a variety of languages.

HopOn India app, developed by Desiwalks Tours Pvt. Ltd., harnesses the power of modern cloud technology to improve visitor experiences and tell stories about destinations such as museums and monuments. With our end-to-end affordable solutions, app provide support to users to start on digital transformation journey. To disseminate information and experiences, high-quality content, simple technology, and user-centric design are combined. These experiences can be about any environment, such as a museum, a monument, a street art collection, a cityscape, or anything else. These can also be based on themes such as heritage, food, sports, art, or living cultures, among others. The idea is to use simple technology to tell authentic stories about our surroundings and create immersive experiences.

Tourism in Tamil Nadu is embracing the digital era with the introduction of a mobile app geared towards enhancing the visitor experience. The Tamil Nadu tourism department has rolled out the "Pinakin" app, catering to both domestic and international tourists. As reported by The Hindu online newspaper, this app goes beyond offering information about tourism in the state; it also features audio capabilities. The app is accessible in two languages and encompasses renowned world heritage tourist sites like Thanjavur, Mamallapuram, Gangaikonda, Big Temple and Darasuram and Cholapuram

"Pinakin" is compatible with both Android and iOS platforms and is set to gradually expand its coverage to include information on other prominent tourist destinations within the state. This move signifies a shift toward digitization and innovation within Tamil Nadu's tourism sector.

Trip My Way app have self-guided audio tours for major attractions and historic walks, user can use app it will provide cultural information so that visitors can immerse

themself in the heritage of the city they are visiting. “Trip My Way” is testing audio tours in Jaipur, as well as an extensive list of heritage monuments (200 sights) in 16 cities. However, following is the statistics information gather from google play store regarding Indian smart guide app download and rating given by users.

Table 2.9.1 Indian App Use and Users Rating as on December 2022

Name of app	**Downloads by Number of users**	**Reviews of users**	**Star rating out of 5**	**Destinations/ Cities in India**	**App size in MB**
Audio Odigos	5k+	127	4.5	12	6.1
Digi Tour	5k+	88	4.7	4	12
Global Vipassana Pagoda	10k+	166	4.6	1	17
HopOn India	10k+	137	3.2	9	17
Pinakin	50k+	492	3.9	24	8.3
Trip My way	10k+	233	4.3	16	11

Source: Google Play App Information

Table 2.9.2 World App Use and Users Rating as on December 2022

Name of app	**Downloads by users**	**Reviews of users**	**Star rating out of 5**	**Destinations/ Cities**	**App size in MB**
Visit Singapore Travel Guide	500k+	528	4.1	Singapore	62
Audio Tour Guide	10k+	-	3	Europe	54

IZI.TRAVEL: Audio Travel Guide	1M+	14.4k	4.2	2500 Location and 102 Countries	15
Smart Guide Your Personal Travel Audio Guide	100k+	1.21k	5	400	64
Pocket Guide Audio Travel Guide	500k+	3.17k	4.2	150	9
Giza Smart Guide	1k+	-	3	300	3

Source: Google play app information

According to google play app information izi.TRAVEL is the words number one free "Audio Tour Guide". This app has provided 8000 outdoor tours, 10100 audio tours, and 2100 museum visits covering 2500 locations in 102 countries with 58 languages. Table 2.9.2 indicate that more destination in SGA indicate more use of SGA. Following table 2.9.3 about tourist arrival in Maharashtra in 2021 and regional count of human tour guide which indicate inadequate percentage as comparative arrival tourist count.

Table 2.9.3 Maharashtra Tour Guide and Tourist Arrival Statistics

Name of region in Maharashtra	**Number of Tour Guide in February 2023 as per MTDC website list**	**According India tourism statistics at a Glance 2022 Domestic tourist visit in Maharashtra year 2021**	**According India tourism statistics at a Glance 2022 foreign tourist visit in Maharashtra year 2021**
Amaravati	31		
Aurangabad	44		
Konkan / Mumbai	102	4,35,69,238	1,85,643

Nagpur	27		
Nashik	143		
Pune	147		

Source: Maharashtra Tourism Development Corporations

2.10 Use of Mobile App by Tourist

Kenteris et al. observed that while an increasing number of tourists turn to the internet for travel-related information before their trips, there is a decreasing trend in the number of users who access tourist content via their mobile devices. They suggest that tourists could derive significant advantages from mobile technology. To encourage tourists to utilize the mobile web for additional services, they propose the adoption of a "web-to-mobile" model. This model involves the web platform creating and launching a mobile application that can function without the need for a continuous internet connection (Kenteris et al., 2011).

he utilization of app technology within the tourism sector is notably diverse, encompassing a wide range of applications, from audio guides used at cultural sites to flight tracking apps and online accommodation platforms. The tourism industry has undergone a profound transformation with the progressive integration of technology into virtually every facet of human life. The widespread availability of smartphones, coupled with the rapid advancements in technological capabilities over the past few decades, has effectively placed "supercomputers" into the hands of the majority of the global population.

This technological evolution began modestly with the introduction of audio guides in museums but has since adapted and expanded to meet the ever-changing demands of tourists. The swift evolution of technology, particularly the integration of tourism with the internet, has propelled us into the current era where the use of mobile technology plays a pivotal role in shaping and enhancing the overall tourist experience (Bellio, 2018). Although the concept of using mobile devices as electronic tourist guides is

already feasible, several challenges in terms of usability, design, functionality, portability, and implementation remain to be addressed. Many of the current "mobile tourism" solutions fall into two categories: they are either pre-packaged applications with fixed content or portable devices that access tourist information via networking, necessitating a continuous connection and data usage (Kenteris et al., 2009). The Sri Lanka Tourism Board advertises well-known tourist destinations using web-based solutions. Web-based solutions actually require constant internet access is required for tourists, in order to learn about this information. In Sri Lanka, there are tourism-related mobile application solutions for the tour guide and navigators with map. Tour guiding increases traveller efficiency and reduces stress in finding a destination, and the majority of these mobile applications have offline capabilities for their features (Thennakoon et al., 2019). The purpose underlying the utilization of a mobile tour guide by international tourists pertains to a mobile application designed to provide them with essential tour-related information. This information encompasses a wide range of details such as popular destinations, maps, travel dos and don'ts, climate variations and seasonal considerations, cultural insights, transportation options, accommodation choices, local cuisine and fruits, useful native phrases for international tourists, and current currency exchange rates (Trakulmaykee & Benrit, 2015). Ordonez et al evaluate the wide range of Internet of Things (IoT) applications in the travel sector. Examine the competitiveness not solely of the private enterprises engaged in this sector, but also the competitiveness of the destinations in the process of evolving into smart destinations. This evolution represents a logical continuation from the concept of smart cities, which are notably shaped by the influence of the tourism industry. Examine the competitiveness not solely of the private enterprises engaged in this sector, but also the competitiveness of the destinations in the process of evolving into smart destinations. This evolution represents a logical continuation from the concept of smart cities, which are notably shaped by the influence of the tourism industry (Ordóñez et al., 2020).

2.11 Indian App Attributes

A set of 22 user-centred principles has been developed for the design and assessment of augmented reality (AR) applications. These principles encompass various dimensions,

personalization, feedback, direct manipulation including enjoyment, predictability, learnability, consistency, error management, help and documentation, familiarity, visibility, defaults, recognition, user control, responsiveness, low physical effort, control-based navigation, and excitement. The study has verified that the use of heuristic evaluation methods is suitable for assessing AR applications (Ko et al., 2013). Based on above literature review and information about the app features following are the featured observed during the use and as information available in the google play store.

According to the app's information on Google play, and based on the author's observation and personal use of the smart guide app for more than 1.5 years, it was discovered that these are the attributes of the smart tour guide app in India. "Audio content Videos content", Images, "Podcast version", "360-degree tours", "Use online Mode", "Use offline Mode", "Virtual reality and augmented reality", "Multiple languages", "International", "Use free of charge", "Pay and use", "Loyalty", "Social media sharing", "Help /Support".

Table 2.11.1 Attributes of Indian Apps

App attributes	**Audio Odigos**	**Digi Tour**	**Global Vipassana Pagoda**	**HopOn India**	**Pinakin**	**Trip My way**
Audio content	Yes	Yes	Yes	Yes	Yes	Yes
Videos	Yes	Yes	Yes	Yes	Yes	Yes
Image’s	Yes	Yes	Yes	Yes	Yes	Yes
Podcast version	Yes	Yes	Yes	Yes	Yes	Yes
360-degree tours	No	Yes	Yes	No	Yes	Yes
Use online Mode	Yes	Yes	Yes	Yes	Yes	Yes
Use offline Mode	Yes	Yes	Yes	Yes	Yes	Yes

Virtual reality and augmented reality	Yes	Yes	Yes	Yes	Yes	Yes
Multiple languages	Yes	Yes	Yes	Yes	Yes	Yes
National/ Regional	Yes	Yes	Yes	Yes	Yes	Yes
International	Yes	Yes	Yes	Yes	Yes	Yes
Use free of cost	Yes	Yes	Yes	Yes	Yes	Yes
Pay and use	No	Yes	No	Yes	Yes	No
Loyalty	No	Yes	No	No	Yes	No
Feedback	Yes	Yes	Yes	Yes	Yes	Yes
Share	No	Yes	Yes	Yes	Yes	Yes
Help /Support	No	Yes	No	Yes	Yes	Yes

Source: Google Play Store Yes (Attribute available Not (attribute not available)

2.12 Hypothesis Development

2.12.1 App performance

Venkatesh defined performance expectancy in 2003 This refers to the extent to which an individual holds the belief that utilizing the system will lead to enhancements in their task or work performance and that required efforts are associated with system use.(Lai, 2015). Furthermore, the performance of the app smart guide app is related to the user's expectations during the tour. The app's strong performance, in conjunction with the app's reuse intention or the app's technological usefulness, motivates users to download and use the app (Palos et al., 2020).

The connection between behavioural intention and user behaviour has been established in various technology adoption models, including the Technology Acceptance Model (TAM), among others. (Davis, 1989). and UTAUT theory by Venkatesh, 2003 number

mobile applications are increasing and number of users increase this theory is useful to study after acceptance technology post behaviour of mobile application users can be test (Palos et al., 2020). The tourism sector's enthusiasm for employing diverse tourism applications to enhance the tourist experience is evident. Nevertheless, there is a scarcity of research concerning consumer adoption of technology within this context. It has been found that PU, PEOU and compatibility are key factors influencing the intention to utilize travel apps (Lu et al., 2015). The app's use context acts as a bridge between perceived usefulness and purchase intentions (Chuang, 2020). Users' trust has a significant impact on the adoption of technology. The technology acceptance model has a great potential for investigating the what kind of relationship between attitude and intention to use constructs and the predictors that influence consumers' adoption of various self-service technology. Because technology is constantly changing, measuring attitudes is difficult; thus, attitudes can only be measured for specific technologies (Kaushik et al., 2015). There are a few indicators of m-tourism adoption in India, which are defined as the use of mobile applications in a technology-based environment, to operate mobile how much time required, and the cost to use mobile device. Usability of M-tourism applications are simple to use, and mobile tourism applications provide opportunities to learn more. Trust is based on risk, and financial transactions are conducted using a wireless device. Mobile applications should be accessible, with familiar language options available to users, and country-specific parameters need to be tested (Vinodan & Meera, 2019). Perceived usefulness has a significant positive impact on the continued use intention of the app (Liu et al., 2020). The potential advantages associated with smart devices exert a more significant influence on the intention to use them compared to the perceived drawbacks or risks (Pradhan et al., 2018).

2.12.2 App Functionality

In the context of AR, functionality includes the option to save and filter information users can use various languages and user can easily navigate while use it (Han et al., 2018b). App functionality is linked to app performance, navigation, and usability (Stoyanov et al., 2015). Expectancy of effort and performance also influences intentions to use mobile applications for shopping (Tak & Panwar, 2017). App sound and image quality are associated with app functions and have an impact on user behaviour and

intention to reuse the application (Jeong & Shin, 2020). The perceived function value of an application is associated with app user behaviour, which influences app use (H. Lee et al., 2018). Using mobile tour guide during the sightseeing tour it increased efficiency of the users (Chuang, 2020). The functionality of the audio guide's software and hardware should be improved as needed for the interaction and social functions of the audio guides (S. J. Lee, 2017). 'Mobile tourism' represents a relatively recent trend in the tourism sector, which revolves around utilizing mobile devices as electronic tour guides. Although a significant portion of the required technology is already accessible, there remain various challenges to overcome, including concerns related to app design, usability of app, portability, functionality of app, and the actual implementation of such solutions. (Kenteris et al., 2009).

2.12.3 App Facilitating Condition

Facilitating conditions (FC) can be defined as the extent to which an individual perceives the presence of an organizational and technical framework that supports the utilization of a system. (Venkatesh, 2015). FC, according to a UTAUT acceptance model, are resources and support available for action (Palos et al., 2020). Venkatesh defines “FC as the perceived level of organisational and technological support for the system”, the UTAUT is useful to do research facilitating condition of app (Barnett et al., 2015). “A facilitating condition is the degree to which a person believes that a technological and organisational infrastructure exists to assist system utilisation”. (Venkatesh et al., 2012) According to UTAUT, behavioural intention to use a technology is predicted to be determined by facilitating conditions and behavioural intention, whereas performance expected, effort required, and social influence are predicted to influence behavioural intention (Venkatesh et al., 2012) Moreover, technology users believed in app performance in terms their expectancy regarding the performance of technology. Augmented reality is a “cutting-edge technology” that will be easier to operate in more suitable conditions. Some subsequent researches have also revealed a link between facilitating conditions and users' PEOU. Convenient circumstances improved perceived ease of usage. As a result, people who experienced extremely favourable settings are more inclined to regard augmented reality as more user-friendly (Ko et al., 2019). UTAUT suggests that the primary factors influencing

the adoption of innovative technology include expectations of performance, ease of use, social influence, and factors that make adoption more feasible. These parameters, previous study indicated that effort expectancy predicted mobile banking usage (Tao Zhou et al., 2010).

2.12.4 App Information Quality

"The level at which users acquire information from an app to fulfil their requirements and anticipations is denoted as information quality."(Liu et al., 2020). Information quality can be defined as "The need for obtaining information, the timeliness of information, the pertinence of information, and the appeal of information" (tom Dieck & Jung, 2018b). perceived ease of use, quality of Information, and PU all influence the decision to use a personalised tourism mobile apps(C. C. Chen & Tsai, 2019). The PEOU is positively influenced by quality of information, system quality, and perceived convenience Three characteristics were discovered to give consumers the idea that the process is easy to use and that they could operate it fast (C. Chen & Tsai, 2017). Information quality play direction role in tourist choice (Lai, 2015). The quality of information, the reliability of the source, and the functionality of travel apps all have a substantial impact on people's opinions of their utility and intentions to use them (Camilleri et al., 2023). In order to investigate the factors that predict user behaviour regarding mobile app intention is based on quality of app and user experience tested by using UTAUT (Palos et al., 2020). The quality of information influenced AR app reuse at urban tourist sites, Furthermore some time offline use can be reduce speed for large data (Han et al., 2018a).

2.12.5 Age and Gender

"The digital adaptability measure can serve as an intervention tool for identifying adaptability in individuals whom educators, employers, and others may perceive as potentially less capable of overcoming stereotypes related to race, class, and gender biases in terms of technological proficiency." (Puckett, 2020). Individual factors such as gender and age moderate relationship, according to UTAUT(Barnett et al., 2015). Sufficient support of technology to elderly visitors useful for to build confidence to use technology (Lu et al., 2015). Irrespective of tourists' age, the number of visitors used at

least two smart tourism technologies on their mobile, while visiting the tourist site (Jeong & Shin, 2020). In terms of gender, the research found no substantial difference in men and women's use of smartphones in various situations. Another key issue that demands more attention is the variation in generations' approaches to using mobile applications, because generations handle certain difficulties, such as smartphone use, differently(Hatamifar et al., 2021). The iSuyyah application in Malaysia has user-friendly features and can be used by users of all ages with ease (Daud et al., 2021).

Linnhoff & Smith done research on interaction on app by male and female author found that, every day Females interact with apps on their smartphones substantially more than men. Women respondents used apps for an average of 4.8 hours per day. Men spent 3.2 hours per day on average. Among app categories, “social media apps” had the highest average usage. Females prefer apps for personal productivity, photography, and social networking. Mobile app usage is more prevalent among men, related to sports, as well as food and drink. According to the findings, Males are less likely than females to accept use of app (Linnhoff & Smith, 2016). Self-service technology acceptance is driven by the majority of TAM determinants and the UTAUT. However, the results for UTAUT and other theory determinants are mixed. Age and gender factors were anticipated to have little or no effect on the adoption of self-service technology by Blut et al because prior research has demonstrated that individual differences have a less impact on this acceptance (Blut et al., 2016).

2.12.6 Attitude Towards Use and Intention to Reuse Travel Apps

Attitudes, according to Ajzen, are "The degree to which an individual holds a positive or negative assessment or judgment of the behaviour under consideration. “And “The term attitude refers to a general evaluation, either positive or negative,” of the behaviour displayed by using travel apps (Ajzen, 1991). Attitude towards using the innovation in technology impact on the continual usage of instant messaging applications, personal attitudes of people have an impact on how frequently tech-related organisations use cloud computing (Ratten, 2016). Individual attitudes influence the continued use of cloud computing for tech-related organisations. PU and PEOU are basic constructs in the TAM model that have important impact on attitude to use of the technology, which influences behavioural re use intention (Ko et al., 2019). According to the TAM-based

studies, attitude toward technology is one of the key antecedents that influence adoption intentions (Kaushik et al., 2015).The adoption of mobile travel apps is influenced by factors such as app performance and design such as compatibility, ease of use, time convenience, social connection, users intention aesthetic, and mobility can all positively influence involvement (Fang et al., 2017).

According to Im & Hancer, attitude is directly and positively related to perceived usefulness (Im & Hancer, 2014). Zhuang et al state that, predicted that when tourists consider augmented reality technology to be beneficial and simple to use, they will have a favourable attitude towards augmented reality technology in museums (Zhuang et al., 2021). The features of mobile technology and its lots of Apps has thus revolutionised how tourists planning for tour and share feedback of their tour by using apps. Because people nowadays are very comfortable with technology and devices (Magano & Cunha, 2019). The impact of quality has been seen on location based app (Wang & Lin, 2017). Perceptions of AR apps are affected by three different types of quality determinants, such as, quality of system, quality of information and quality of service. In the end, their influence on visitor satisfaction encourages users to re-use mobile AR apps (Anand k.et al.,2022 Reusing mobile apps is positively correlated with facilitating conditions. Internal control is also positively correlated with the expectation of reuse through effort (Fong et al., 2017).

2.13 Research GAP

It is quite important to find research gaps according to user reviews in the Google Play store and literature reviews on this research. There are less studies on the use of SGA and adoption of SGA in India. The tourism sector is a seasonal one, and there is a seasonal shortage of tour guides who are authorized by the government. However, the Indian government's tourism ministry showed remarkable initiative by releasing the smart guide app for tourists. These apps are currently only accessible in a small number of tourist destinations, and studies on app reuse are need to explore. App quality dimensions and app PEOU and app PU impact on app user intention to reuse.

Several sightseeing places which are in developing stage, for supplies new technology to tourist such as mobile tour guide app (Lai, 2015). Table 2.9.1 illustrate the use of

SGA in India and number of destinations / cities covered by SGA. it is concluded that till low use of SGA. “Audio guide” used few places and proper implementation of “Audio guide” was not done because of different features and content and which is cause of less acceptance (S. J. Lee, 2017). “Smart Tourism” acceptance in museums is relatively less, but some areas shown scope for increased app use (Naramski, 2020). Travel app adoption research with complexity, and familiarity need to explore (Ali et al., 2021). Study of AR app function and usability need to explore (Tarantino et al., 2019). It is recommended that future scholars investigate comparative studies using different national subcultures and to improve the app functions to provide good service to tourist (Hussein & Ahmed, 2022). User positive view points need to incorporate in future research on the app interactions by creating virtual recreations of cultural heritage locations (Briciu & Briciu, 2020). Customers want compatibility with mobile devices as it is one of the criteria for embracing cutting-edge technology. As present users cannot use travel app on any devices because of the variations in their systems and programmes, it is necessary to examine app user intention (Chuang, 2020). Currently, there are differences between various travel apps' menus and the services they aim to provide, and users can identify and use multiple designs as new designs. The research is expected to improve user usability and recommend changes for the reconstruction of the apps (Yeonsuk Kim & Kim, 2020). Model with app information quality with other factor predict consumer attitude more accurately in future these factors need to study (Yaeri Kim et al., 2021). Models are useful to studying about travel app and in future more extensively analyse travel app adoption and to establish whether, theoretically, another model would be better suited in assessing characteristics examined in earlier studies, such as innovativeness, facilitating services. The utilisation of additional APP-related technologies, as well as the future of mobile telephony and the Internet of Things, will become future new trends in the travel sector (Sánchez-torres & Argila-irurita, 2021). App with AR technology are not yet adequately promoted, Future research should look into ethnic differences in acceptance of such apps, as well as other demographic characteristics (Zhuang et al., 2021). Individuals use of transport mobile applications adoption, perceived usefulness and ease of usage need to investigate according to study in south Korea (Dewan et al., 2022). More technologically oriented activities that make better use of ICT at various levels Mobility solutions, smart

applications, smart gadgets, and smart transportation can only assist to promote ICT. Tourist movement at destinations is simple and convenient. The government of India is engaging with business entities through PPP (Public-Private Partnership) and user-friendly applications, as well as technology transfer efforts (Bhatia, 2022). However, SGA technology is new in India country specific study need to do with new app attribute, methods because the changes in app technology is going on.

Research Gaps:

- Low use of SGA indicate that the growth of smart guide app needs to be explore in India.
- Lots of research done on travel apps with different app quality dimensions, but not much on smart guide apps, hence research on smart guide app quality dimensions has to be done in an Indian context.
- There has been fewer research on the user acceptability of smart guide apps and user intents to reuse them so research, on reuses intention need to do.
- The function of smart guide app, as well as its components, such as user characteristics, experience, complexity, and familiarity, need to be investigated.

2.14. Development of Conceptual Model and Hypothesis

With reference to above previous study was conducted with use of such UTAUT theory. During the literature reviews its discovered that few authors used different independent variable in their model or research and they have conducted successful study .Al-Emran & Granic study analysis showed that many research used different or one or more theory to do research (Al-Emran & Granić, 2021).

From the literature review section, few paper discovered that studies on app performance, app functionality, app facilitating conditions has been done. App information quality was investigated in less studies. However, the majority of research was conducted outside of India on other travel apps. Furthermore, the focused of research on the context-dependent new needs of Indian app users, such as multilingualism, time savings, offline and online app usage, app information quality,

and the following app quality dimensions were identified. Following are SGA app qualities identify for develop research model.

1) App Performance: (Interactive, Accessible, Time saving, Consistency).

2) App Functionality:(Navigation, Operability, Customization).

3) App Facilitating condition:(Android & iOS support mobile phones, Online or offline mode, AR & VR, Size).

4) App Information (Audio, Video, Image, and Text quality and quantity Multilanguage).

However based on previous research following hypothesis model where prepared.

H1App qualities are positively associated with PEOU of SGA and positively influence on attitude towards use of SGA.

H2 App qualities are positively associated with PU of SGA and positively influence on attitude towards use of SGA

H3 App qualities are positively influence on attitude towards use of SGA and positively associated with intention to reuse SGA.

H4 PEOU is positively influence on attitude towards use of SGA

H5 PU is positively influences on attitude towards use of SGA.

H6 Positive attitude of SGA is positively influencing the reuse intention.

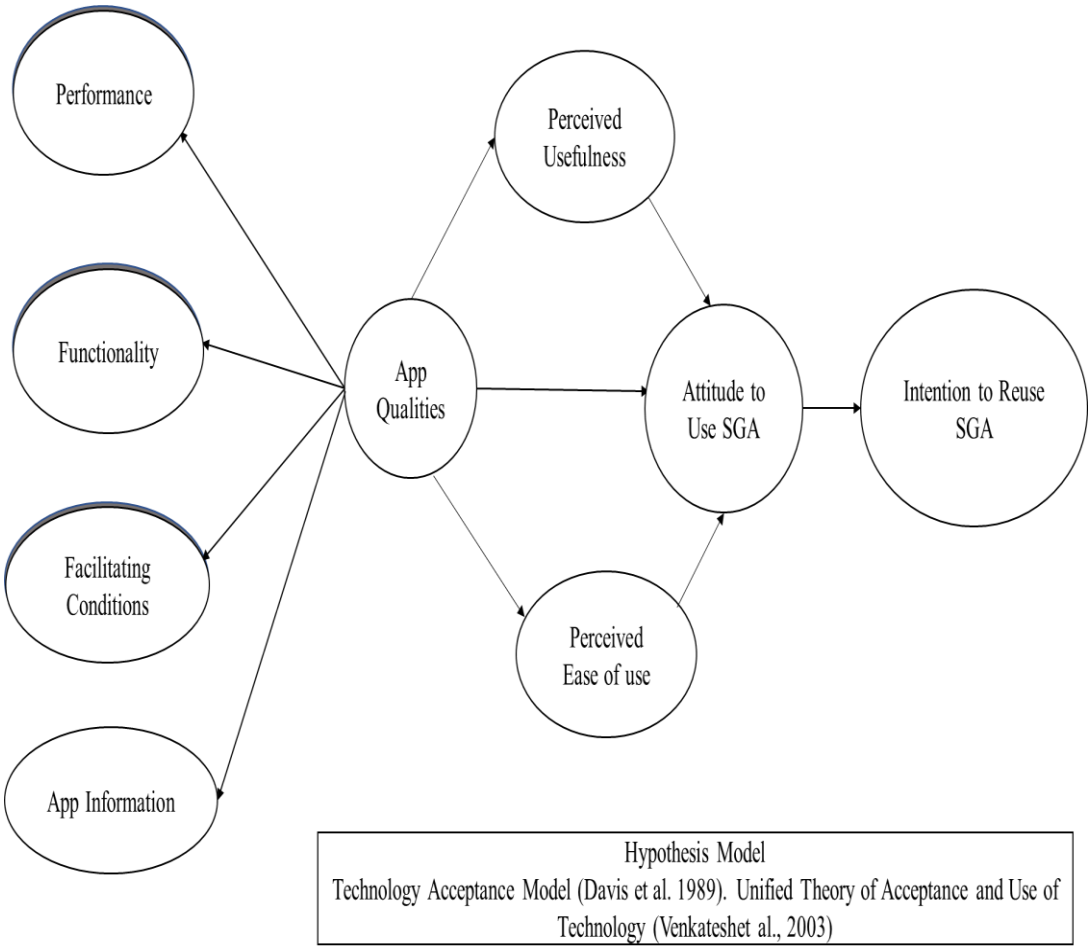


Figure 2.1 Hypothesis Model

2.15 Chapter Summary

This chapter discusses what has been done in the past in terms of SAG app quality, what has not been done, and what needs to be investigated. The chapter will be useful for future academics to learn about app attributes and definitions. The chapter illustrates the development of a conceptual model and hypothesis. The chapter discuss past, present and future of SGA in India, as well as statistics on SGA use and the ratio of human tour guides to visitor arrivals in Maharashtra.

Chapter 3

Research Methodology

3.1 Introduction

Aim of this study is analysis of smart guide app quality dimensions and its impact on tourist reuse intention. According to the literature review of this study app qualities dimensioned identified. This research has objectives and to fulfill the objective targeted research methodology is required. To resolve the problem systematically research methodology, need to use. It might be thought of as the study of scientific research methodology. Within it, explore the various techniques commonly employed by a researcher to assess this research issue, along with the rationale behind their choices. The researcher should possess a solid understanding of both methodology and research methods and procedures (Kothari, 2006). “The scientific method is a systematic set of strategies for constructing scientific knowledge”, such as how to conduct reliable observations, analyses results, and generalize those results (Nayak & Singh, 2020). There are two types researcher quantitative research and qualitative research according to objective methodology can be used (Yannis & Nikolaos, 2018).

3.2 Research Design

According to Kothari, research design can be defined as a comprehensive strategy for gathering empirical data in a research endeavor. This serves as a structured framework for empirical research with the goal of addressing particular research inquiries or assessing specific hypotheses. At its core, it outlines a minimum of three crucial components: 1. data collection methods, 2. instrument development, and 3. sampling procedures. A research design precisely outlines the approach and methodology that will be employed in the research, concentrating on key aspects guiding the research process (Kothari, 2006).

The research has used a quantitative research approach. This method generates quantitative data that may be subjected to rigorous quantitative examination. Quantitative research was carried out through survey method which quantifies the consumer behavior towards reuse of smart guide app apps, while statistical data interpretation is possible.

"Quantitative research is commonly distinguished by the systematic and empirical examination of phenomena through statistical and mathematical techniques, alongside the manipulation of numerical data." According to Yannis and Nikolas in the quantitative research, the technique of estimating numbers is crucial. Relationship between empirical observation and quantitative mathematical expression relations. Data in quantitative research is often selected and processed numerically and following are the reasons to use this method

(a) Extensive quantitative data analysis and processing are essential for confirming hypotheses and evaluating a theory.

(b) The theories under consideration are subject to a degree of uncertainty.

(c) Effective research can be carried out using straightforward questionnaires with concise queries and brief responses.

(d) The gathered data can be quantified and subjected to comparisons. (Yannis & Nikolaos, 2018).

Scientific research investigations can be categorized into three primary groups depending on their goals: "Exploratory," "Descriptive," and "Explanatory." Exploratory research is often conducted in emerging fields of study, with the following aims:

1. To determine the size or scope of a specific phenomenon, issue, or behavior,

2. To come up with some early theories (or "hunches") regarding that occurrence, or

3. To determine whether it is feasible to conduct a more in-depth investigation into that phenomenon.

Exploratory research may not offer a particularly precise comprehension of the focal issue. but it may be valuable for determining the type and scope of the issue and functioning as a useful foundation for further investigation (Nayak & Singh, 2020). According to the research's epistemological perspective, "Qualitative research utilizes techniques like participant observation or case studies to produce a narrative, descriptive portrayal of a particular environment or activity." It is a group of material and

interpretive actions that make the world visible. The world is better off as a result of these actions. They depict the world through self-memos, interviews, field notes, dialogues, images, and recordings. (Nayak & Singh, 2020).

Content analysis is the process of analyzing the content of written materials such as books, magazines, newspapers, and other oral materials that can be spoken or printed. Prior to the 1940s, content analysis was primarily a quantitative examination of documentary material for specific characteristics that could be identified and counted. However, Since the 1950s, the main focus of content analysis has been the overall message or meaning of existing materials. The distinction is comparable to that between informal and in-depth interviews. The latter kind of content analysis is frequently linked with “Bernard Berelson”. The measurement "content analytics" is proportionate. The penetrating power of content analysis can be utilized to assess the strength of a force. (Kothari, 2006). However, the method used to conduct this study is a “quantitative research” strategy. And this study is exploratory research in terms of the literature review. Tourists use a variety of applications while on the tour. One of these is the smart tour guide app, which is utilized by tourists in place of human tour guides. Such smart tour guides are available in India, but the number of user installations in the Google Play Store is quite low, needing further study of the app's usability growth and reuse intention data from India.

3.3 Problem Statement

The growth of technology is closely related to the tourism sector. Technology enhanced smart tourism, and it offers convenience, interaction, and individualised services to travellers. However, visitors to cultural heritage sites using technology-enabled audio guides are still not as high as familiar (S. J. Lee, 2017). The creation of M-tourism apps offers data, links, travelogues and articles, pictures, and specifics of unexplored locations. “Walking tour app,” “GPS tracking”, “Direction indicators,” such app useful to gather information about tourist site. “M-tourism apps” app assist users do hotel reservation and car reservation. Applications of mobile commerce are widely used in the “M-tourism” industry. These include mobile payments and purchases, mobile

marketing and advertising, mobile money transfers, location-based services, mobile games, and mobile ticketing (Vinodan & Meera, 2019). Numerous tourist destinations are still lacking modern high-tech amenities like mobile tour guides that operate on apps. (Lai, 2015). Because of the differently produced material and inconvenience of using the devices, the “Audio guides” utilised in palaces have not effectively fulfil their essential use of “smart tourism”, which results in a less acceptance rate for these gadgets (S. J. Lee, 2017). “Smart tourism” acceptance in museums is relatively less, with some areas showing growth in future (Naramski, 2020). Travel app adoption research with complexity, and familiarity need to explore (Ali et al., 2021). Component of smart tourism, augmented reality has been created to offer route direction and tourist places information. Based on active usage by tourists, its use will optimise visitor satisfaction. Three elements have been identified as motivating factors for tourists to actively use augmented reality. Important factor to mentality of being prepared to use technology is preparedness which refers to a tourist's general. Situation handling and visualization of app are another important component (Chung et al., 2015). Exploration of the technology adoption process and fresh opportunities for new technology adoption is ongoing with new research models (Kaushik et al., 2015). PU has a positive effect to carry on acceptance of app (Liu et al., 2020). Smart device usage objective is more forcefully affected by PU as comparative perceived risk (Pradhan et al., 2018).

The TAM is a crucial paradigm for comprehending the possible determinants of human behaviour in the acceptance and rejection of technology, according to numerous writers who have conducted study on technology acceptance in various nations throughout the world. The model's broad applicability to multiple technologies has only been partially proven by investigations. The UTAUT states that behavioural intention and facilitating factors determine technology use, with behavioural intention being determined by “Performance expectancy,” “Effort expectancy,” and “Social influence.” Individual distinctions like age, gender, and experience are also taken into account.

Over the last few years, there has been a gradual increase in the acceptance and development of SGA. According to press report the first official smart tour guide app, "Audio Odigoes," was released in 2019 by the Indian government. Tourists who want to take a self-guided tour for a cultural heritage site while wandering around can benefit

from tourist guide applications. The adoption or rejection of technology by certain users is still up for debate. It is essential to carry out in-depth research that adds to the understanding of how each person accepts and uses technology. However, a variety of applications are available for tourists to plan their tours, such as hotel booking apps, ticket booking apps, itinerary planning apps, google maps, weather apps, traffic apps, and smart tour guide apps for sightseeing tours. Figure 1.2 depicts the less use of a smart tour guide app in India. Supply of human tour guides seems less while comparing the arrival tourist ratio with authorized human tour guides in Maharashtra. However, smart tour guide apps are a good alternative option for users by Indian government, and other private SGA providers. Research regarding the purpose of using a smart guide app by tourists, why will tourists use it again? It is necessary to investigate why they should accept such apps. The intention to reuse SGA is dependent on app quality dimensions, such as app performance, app functionality, app facilitating condition, and app information quality. How the technology is useful and enhances their tour experience based on PU and PEOU. This study will determine reuse intention of smart guide app users in Indian context by using such parameters and theory of technology acceptances model and theory of unified technology acceptance and use of technology. Technology improves daily and what are the user expectations from the SGA app developers and SGA app providers However, the user perspective on selecting an audio guide in a cultural heritage site has not been thoroughly researched, and only a few papers have focused on technology acceptance.

Objective of this research is evaluating usability growth of SGA and identifying SGA app quality dimensions, the impact of PEOU and PU on attitude to use SGA and intention to reuse SGA.

3.4 Research Question

1)What is the usability growth of tourism smart guide apps in India?

2)Which are the qualities of smart guide apps?

3)What is the impact of tourism smart guide app quality dimensions, PEOU and PU on app users?

4)What is the impact of PEOU and PU on tourists' attitudes and intentions to reuse SGA?

3.5 Research Objectives

1. To examine the usability growth of smart guide apps in India.

2. To identify the quality dimensions of the tourism Smart guide app.

3. To determine the influence of tourism smart guide app quality dimensions on PEOU and PU of tourists.

4. To evaluate the influence of PEOU and PU on tourists' attitudes and intentions to reuse SGA.

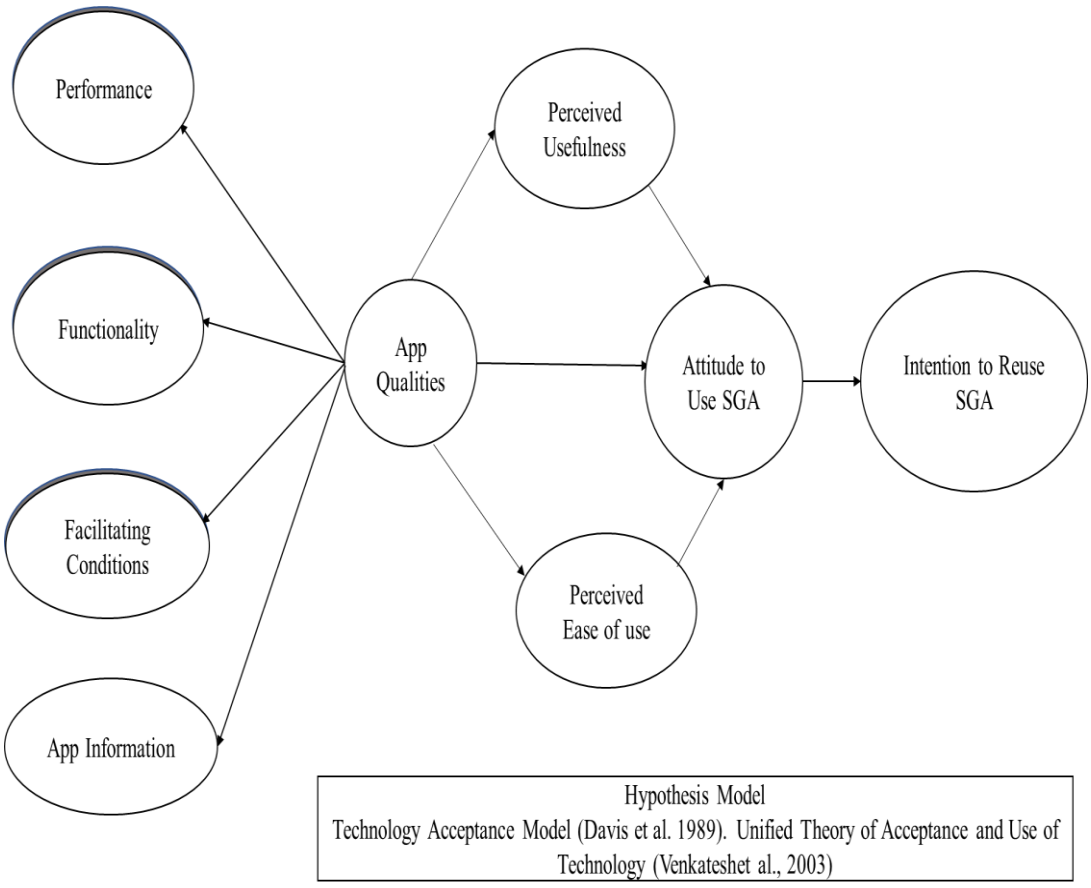


Fig 3.1 Hypothesis Model

3.6 Hypothesis Base on Reference and Model

H1App qualities are positively associated with PEOU of SGA and positively influence on attitude towards use of SGA.(Lu et al., 2015;Lai, 2015)

H2 App qualities are positively associated with PU of SGA and positively influence attitude towards use of SGA(Chuang, 2020; Kaushik et al., 2015)

H3 App qualities have positive influence on attitude towards the use of SGA and are positively associated with intention to reuse SGA.(Yaeri Kim et al., 2021)

H4 PEOU is positively influence on attitude towards use of SGA(Kaushik et al., 2015;Palos et al., 2020)

H5 PU is positively influence on attitude towards use of SGA.(Kaushik et al., 2015; Liu et al., 2020).

H6 Positive attitude towards SGA is positively influencing the reuse intention.(Liu et al., 2020).

3.7 Operational Definition of Variables

Operational definition of variable is an important for research because operational definition bridges the gap between abstract concepts and the concrete methods used to assess those concepts in a research study. It ensures that researchers use consistent procedures, promoting reliability and validity in their investigations. However, such transparency in research ensures that both researchers and others can comprehend and reproduce the study, fostering clear and accurate communication. According to Balmey various definitions will work better in different situations, necessitating a final trade-off between comparability, validity, and reliability (Blamey, 1997). Following are the operational definition for this research variable and all the variable was measure by Likert scale. In the Appendices 1 survey questionnaire given for more information.

Performance: App performance is the degree to which a person believes that during the use of smart tour guide app, performance of app meets their expected qualities in terms of app interactivity, app accessibility, time saving and app consistency.

Functionality: App functionality is the degree to which a person believes that during the use, functionality of smart tour guide app meets users expected qualities in terms of app navigation, operability, customization functions of app.

Facilitating Conditions: App facilitating condition is the degree to which a person believes that to use of smart tour guide, app infrastructure exists to assist system utilisation, in terms of Android & iOS support mobile phones, Online or offline mode, AR & VR, Size of app.

Information Quality: App information quality is the level at which users acquire information from the smart tour guide app. An app to fulfil their requirements as tour guide, in terms of app audio, video, image, and text quality and quantity, in Multilanguage.

Perceived Usefulness: Perceived usefulness is the degree to which a person believes that using the smart tour guide app, enhance tour experience and attitude toward the use in terms of app qualities (Performance, Facilitating Conditions, Functionality, Information Quality).

Perceived Ease of Use: Perceived ease of use is the degree to which a person believes that no efforts required to use of smart tour guide app in terms of app qualities (Performance, Facilitating conditions, Functionality, Information Quality).

Attitude: The degree to which an individual holds a positive or negative assessment or judgment attitude to use smart guide app, based on app qualities and perceived ease of use and usefulness.

Reuse Intention: Reuse intention is that user decided to use smart guide app based on the app quality and perceived ease of use and usefulness.

3.8 Population

The research was conducted in the Maharashtra state in the Mumbai city, because Mumbai has UNESCO world heritage sites like The “Chhatrapati Shivaji Maharaj Terminus” “Elephanta Caves,” and The “Victorian Art Deco Ensemble of Mumbai” apparat form this other natural and manmade attraction are there where tourist visit throughout year and few of them may use smart guide app like Hop on India, Global

Vipassana Pagoda, and other, so all Indian residents tourist who have been used the Smart Guide app or visit to Mumbai made up the population of the current study.

3.9 Sampling Frame

Indian residents and Indian Smart guide app users, who have used smart guide apps before filling questionnaire in past or present.

To confirm whether the respondent used the smart guide app before responding to the questionnaire after filling out the profile information question. Have you used the smart guide app in the past? If the answer is yes, continue; (Proceed Further) jump in next section. If the answer is no, stop. (No need proceeds further). And submit

3.10 Sample Size and Calculation

It was impossible to separate cases of smart guide app users from the general number of tourists visiting the country or Mumbai, the study was conducted with an unknown population size. The sample size at a 95% level of confidence and a 5% margin of error is computed to be 384 for an unidentified population. utilizing the formula below. However, several related studies on travel apps that used sample sizes ranging from 400 to 700 were successful. for example (Chuang, 2020)- 495, (Lu et al., 2015)- 684 (Liu et al., 2020a)- 600, (Palos et al., 2020)-552.

- **Sample size** $= \dfrac{\frac{Z^2 \times p(1-p)}{e^2}}{1+(\frac{Z^2 \times p(1-p)}{e^2 N})}$

"N = population size • e = Margin of error (percentage in decimal form) • z = z-score" (Source survey monkey.com)

3.11 Data Collection Method

Sample size and population since a total population is frequently too huge and too expensive to survey and evaluate, researchers usually create a method approach to collect a sample. This is known as sampling. The size of the actual survey sample is usually determined by three factors: the researcher's desired level of confidence, the

allowed error range in the final result, and how the attribute being assessed is distributed across the survey population. If researcher know these three things, researcher can use the formula to calculate the sample (Nykiel, n.d.)

Convenience sample "Convenience sampling involves individuals who are easily accessible and willing to take part in a study, and it is sometimes referred to as accidental or random sampling." When a group of people cannot be located to survey or interview, this is a fairly simple option for researchers to choose from. From a population intended for observation, the study population is conveniently selected; an example of this would be to seek for patients with a specific disease in support groups. While convenience sampling only includes items that are accessible and readily available, carelessness is never permissible (Nayak & Singh, 2020). However, individuals who already use the Smart Guide app and those who use it at tourist locations during study duration, visitors requested to participate and fill google form, with their consent are the study's sample population. From such individuals, collected responses in online and offline mode.

3.12 Pilot Study:

3.12.1 Development of Instrument for Pilot Study

Items are adopted from literature reviews and previous similar studies, at the time of adoption all items with values of Cronbach's alpha from 0.80 to 0.95 are considered. Above is the generally accepted acceptable reliability range for explanatory research. Before start collection of data, the instrument was emailed to eight tourism and hospitality experts to ensure its face validity and content validity. Expert feedback aided to improving the instrument's readability from the perspective of the items and all the comments from experts resulted in a few minor changes were made in to the questionnaire's sentence, and experts' comments were included. In a similar study, a similar questionnaire validation approach was used by Lai, Ko, Ali, Yari Kim (Lai, 2013; Ko et al., 2019; Ali et al., 2021; Yaeri Kim et al., 2021). However, silently modifications were done in items. So, pilot study was conducted and responses were collected from 87 users in the month of June and July 2022 and 17 responses found invalid during the data cleaning process.

The instrument distributed into five sections, and the demographic data of the participants will be collected by questionnaire.

Table 3.12.1 Item Distribution for Pilot Survey

Source Survey data

Section	Description	Number of Items
Section 1	Screening and Profile	14
Section 2	App Qualities 1)Performance, 2)Facilitating, conditions, 3)Functionality, 4)Information Quality	20
Section 3	PEOU, PU of SGA	10
Section 4	Attitude towards the Use Smart Guide App.	05
Section 5	Intention to Reuse Smart Guide App	05
Total	08	54

Table 3.12.2 Reliability Analysis of Pilot's Instruments

Dimension	Construct	Number of Item's	Cronbach's Alfa	Action Taken	Reasons for change
App Qualities	Performance	5	0.801	All retained	Not applicable
	Facilitating conditions	5	0.802	All retained	
	Functionality	5	0.783	All retained	

	Information Quality	5	0.891	All retained	
Intention to reuse of SGA	Perceived Ease of Use	5	0.887	All retained	
	Perceived usefulness	5	0.876	All retained	
	Attitude	5	0.870	All retained	
	Intention	5	0.848	All retained	

Source Survey data

3.12.2 Validity.

There are two main types of validity: internal and external. When determining whether research findings may be generalized or extrapolated for the entire population, for all comparable circumstances, or in contexts other than those in which the research was conducted, research was conducted. We discuss content when referring to the instrument's internal validity (Ursachi et al., 2015). The introduction of Cronbach's Alpha in 1951 by Cronbach. The correlation between various test items is the foundation for an instrument's internal consistency. This correlation shows whether several items meant to measure the same construct have similar outcomes. computed using correlations between all item-item pairings for Cronbach's Alpha. Most experts agree with the value range between 0.6 and 0.7 indicates a reliable level However, value 0.8 or more known as very good level. Values 0.95 and above may indicate redundancy (Ursachi et al., 2015).

3.13 Final Study

3.13.1 Research Instrument

Post instrument refinement the final instrument prepares and shares with the respondent at the opening some of the basic information added about the study and assurances given to respondent data will be used only for research purpose only.

Table 3.13.1 Item Distribution for Final Survey

Source Survey data

Section	Description	Number of Items
Section 1	Screening and Profile	14
Section 2	App Qualities 1)Performance, 2)Facilitating, conditions, 3)Functionality, 4)Information Quality	20
Section 3	PEOU, PU of SGA	10
Section 4	Attitude towards the Use Smart Guide App	05
Section 5	Intention to Reuse Smart Guide App	05
Total	08	54

Section 1 is consisted with 14 Questions including screening and profile questions. In this section few questions regarding respondent experience about SGA use, since they are using, which SGA use by them where asked. Question no 11 is to confirm respondent has used SGA in the past before the responding to questionnaire. If answer is yes then respondent jumped to section 2 and if answer is no then no need to proceed further submit the response.

Section 2 Regarding app qualities and distributed into 4 sub category 1) Performance, 2) Facilitating, conditions, 3) Functionality, 4) Information Quality each category consist with 5 statements regarding SGA attributes and responses was collected with 5-point Likert scale.

Section 3 consisted of 10 statements. 5 statements on PEOU of SGA and 5 on PU of SGA. Responses are collected with 5point Likert scale.

Section 4 consisted 5 statements regarding attitude towards use SGA. and responses was collected with 5point Likert scale

Section 5 consisted 5 statements regarding intention to reuse SGA. and responses was collected with 5point Likert scale

3.14 Process of Data Collection

According to the sample frame for this study and sampling method, collection of data has been done at various tourist interest places in Mumbai in online mode by feeling google form. Visitor at “Global Vipassana Pagoda,” “Chhatrapati Shivaji Maharaj Terminal”, “Elephanta Cave” are targeted places. At “Global Vipassana Pagaoda” app provider recommended to visitors to use app and sign board are marked to guide them regarding use of SGA. However, visitor such as educational tourist, family group tourist, individual tourist recommended to use such app or if they have already used such smart tour guide app in past then requested to fill questionnaire by using google form, mobile and tab, laptop provided to respondent. For collection of data friends, relatives’ assistance has been taken. Due to the lack of time if respondent deny to fill response at tourist places, for such tourist recommended they can fill at home, hotel as per their convenience time. Apart from this social media such as WhatsApp, Telegram, Facebook, email was used for data collection. Collection of data has been done between August 2022 to October 2022 and total 861 responses was collected.

3.15 Data Analysis

"Structural equation modeling (SEM) comprises a range of statistical techniques used to investigate relationships among one or more independent variables (IVs), which may take the form of continuous or discrete variables, and one or more dependent variables (DVs), which can likewise be continuous or discrete." IVs and DVs can both be considered factors or measured variables. simultaneous equation modelling, causal analysis, Caustic modelling study of covariance structures, path analysis, and confirmatory factor analysis are all terms used to describe structural equation modelling. SEM Allowed to access the solutions of questions involving multiple regression analyses of factors. At its most basic, a researcher proposes a link between a single measured variable.(Stein et al., 2017). Nevertheless, in accordance with the study's needs, SPSS (AMOS) was employed for conducting the analysis. Although methods

such as SEM, CFA, and FA have been commonly utilized in UTAUT research thus far, their application in the TAM has been comparatively limited. PLS and regression analysis, on the other hand, have been frequently employed in studies based on both TAM and UTAUT. (Williams et al., 2015).

Table 3.15.1 Method and Software Used

Objective nos.	Objective	Method Used	Software Used
1	To examine the usability growth of smart guide apps in India.	Systematic literatures reviews, content and sentiment analysis and Descriptive statistics	Microsoft Excel and Word Document
2	To identify the quality dimensions of the tourism Smart guide app.	Systematic literatures reviews, content and sentiment analysis and Descriptive statistics	Microsoft Excel and Word document
3	To determine the influence of tourism smart guide app quality dimensions on PEOU and PU of tourists.	Descriptive statistics, SEM	SPSS, AMOS
4	To evaluate the influence of PEOU and PU on tourists' attitudes and intentions to reuse SGA.	Descriptive statistics, SEM	SPSS, AMOS

Source by author

3.16 Sentiment Analysis

Understanding users' emotional states (whether they are feeling positive, neutral, or negative) is valuable for delivering tailored assistance. Additionally, it would be intriguing to ascertain whether this emotional state aligns with their typical demeanor or if a notable deviation has occurred. Detecting alterations in a user's behavior through their messages, especially when sentiment histories are accessible, can serve as an indicator of mood shifts, potentially necessitating specific actions or recommendations. (Ortigosa, 2013).

Online reviews are important for business such reviews are written by users of product and these are known as Users Generated Content (UGC). Such content impact on the consumer decision making about product. However, UGC impact on the profitability, revenues generation and overall economic performance of the company. Furthermore, qualitative and quantitative analysis of UGC gather from online reviews websites discusses about what recommendations by consumers and what kind of rating given by the users of the product (Chatterjee, 2019). Satisfaction of customers is important for the organization; literature provide less information about customer behavior and satisfaction. To know more about it qualitative and quantitively information generated from online reviews, it includes rating given by user in numeric format and in form of text. However, literature focus only on the sentiment of consumer satisfaction and recommendation. In addition, sentiment mapping of customers reviews explained about emotions and satisfaction of the users in textual reviews (Siering et al., 2018). However, one must also take into account consumer "emotions," which are crucial to customer satisfaction; simple classification as positive or negative has little information content. It is important to realize that the level of customer satisfaction can be significantly impacted by the emotions expressed in consumer reviews (Chatterjee, 2019).App store users have the option to express their opinions about downloaded applications by assigning star ratings and composing text reviews.

Recent research indicates that this feedback serves as a valuable source of information for app developers, encompassing insights into user needs, suggestions for enhancements, user sentiments regarding particular features, and detailed accounts of user experiences with these features. Nonetheless, the sheer volume of reviews for

numerous apps makes manual processing impractical, and the quality of these reviews fluctuates significantly. Star ratings are given to the entire app, leaving developers without a means to analyze feedback at the feature level (Media et al., 2018). The app developers are aware of the customers' interests and have an idea of the target audience for the application in question, but there is little scope for enhancement and credibility unless they receive appropriate feedback. This is what the developers desire. Customer feedback and ratings have always been important metrics for reviewing performance and making appropriate recommendations to improve the app's functionality (Venkatakrishnan et al., 2020). There has been limited attention given to the possibility of discerning customers' intentions to revisit a hotel from their feedback reviews. This area of research could assist service providers in pinpointing the factors that affect customer return behavior and in enticing more customers to use their services again. Additionally, extracting these implicit intentions from online reviews can offer insights into predicting future customer return behavior to a hotel, thereby influencing overall customer satisfaction (Park et al., 2020).

3.16.1 Selection of app for Sentiment Analysis and Content Analysis

Selection of app has been done based on following set criteria for the SGA, which are easily available for download from the Google Play store. However, subject to meets the following criteria.

1) The application must be available only for Indian tourist destinations at list for minimum two cities / destinations.

2) An application must be available in multiple languages.

3) A minimum of 5000 users must download an application.

4) A minimum of 50 users must review an application.

5) App rating in google play store must be 3 or more.

Table 3.16.1.1 SGA App Selection

Name of the app	More than two destination / cities in the app	Multiple languages options	Download by number of users	Total reviews	Over all app rating by users
Audio Odigos	yes	yes	5000+	127	4.5
Digi Tour	yes	yes	5000+	88	4.7
Global Vipassana Pagoda	no	yes	10000+	166	4.6
HopOn India	yes	yes	10000+	137	3.2
Pinakin	yes	yes	50000+	492	3.9
Trip My way	yes	yes	10000+	233	4.3

Source prepares by author

Different authors used app selection criteria in their app studies. However, such as language, minimum or maximum download of app has been used by Eis et al in app study (Eis et al., 2022). With reference to table 3.15.1.1 and according to the study's research criteria, Audio Odigos", "DigiTour", "HopOn India", "Pinakin app", and "Trip My Way app" were chosen for sentiment analysis. "Global Vipassana Pagoda" app does not meet research selection criteria so is not consider for sentiment analysis.

3.16.2 Process of Data Collection for Sentiment Analysis and Content Analysis

Data collection is an important aspect of research. This study proposed sentiment analysis to learn about users' sentiments after using the app, such as whether they were positive, negative, or neutral. After using the app, users wrote reviews on the Google Play store. Although such reviews are easily accessible, copied and pasted all of them into Microsoft Word document software was part of the data collection process.

3.16.3 Data Cleaning

Data cleaning is an important work for systematic and accurate analysis of data, the following process adopted from sentiment analysis research (Ortigosa, 2013). and (Jabbar et al., 2019).

3.16.4 Spelling Checking

The language used in user reviews is usually very casual. Words with repeated letters and the use of short words are common (e.g., ive corrected as I Have, bcoz is corrected as because in the English language) all spelling checking done into the Microsoft Word document software.

3.16.5 Translation of language

Users can use apps in regional or national languages, some users have written reviews in Hindi or Tamil, which have been converted in to English by using Google trans letters.

3.16.6 Tokenization

Tokenization is the method of breaking down a whole sentence into individual tokens such as symbols, keywords, and phrases. Some characters, such as an exclamation mark, are removed during tokenization.

3.16.7 Removing Stop Words

Stop words are words within a sentence that do not serve any essential purpose in text mining. Typically, these words are eliminated to enhance the efficiency of analysis. The specific stop words used can vary in form based on the language and region.

3.17 Software Used for Sentiment Analysis

After data cleaning sentiment analysis performed by using Microsoft Excel and the Azure Machine Learning web service.

3.18 Content Analysis

According to Zhang and Wildemuth content analysis is not only for promoting and creation of new theories and model but also validation of theory can be done by using qualitative data content analysis. It provides detail description about specific

phenomenon by applying proper method of data cleanup, coding process and interpretation. However, qualitative content analysis is important alternative method for working with interpretative (Zhang & Wildemuth, 2005). Hsieh and Shannon in 2005 provided the following definition for qualitative content analysis: "It is a research approach for subjectively interpreting textual data by systematically categorizing and identifying themes or patterns through the process of coding."(Zhang & Wildemuth, 2005). Additionally, Hsieh and Shannon discussed three techniques within the realm of "qualitative content analysis," which vary depending on the degree of "inductive reasoning." involved 1) "Conventional qualitative content analysis involves the direct and inductive creation of coding categories from raw data. This method is particularly valuable for constructing grounded theories."

2) "Directed content analysis commences with a theory or relevant prior research findings. This approach is typically employed to confirm or enrich a conceptual framework or concept."

3) "Summative content analysis initiates with the quantification of words or apparent content and subsequently broadens the analysis to encompass underlying meanings and themes. Although it may initially seem quantitative, its objective is to explore the usage of words or indicators in an inductive manner." (Zhang & Wildemuth, 2005) Moreover this research used inductive research approach.

As per Law, a comprehensive exploration of the impact and influence of social media throughout the entire process of tour planning reveals that "User Generated Content" (UGC) is a more dependable source of information compared to official tourism websites, travel agencies, and mass media advertising. (Law et al., 2014). What is content, speeches, The written text, images, videos, audio, and hypertext found in any form of communication can all be considered content data". Content analysis is used by marketing researchers to examine content. The coding method was develop adopted from previous research (L. W. Lee et al., 2019).

To discover more about the SGA, the research incorporates analysis of SGA users generated content method of research. For all accessible reviews used for sentiment analysis, an inductive content analysis was performed. The method was chosen, in

consideration of requirement and applicability in the view of new fields of study where no required literature available (Molnar & Moraru, 2017). However, the selection criteria of SGA for content analysis are mentioned in table 3.15.1.

3.18.1 Code and Sub Code Development for Content Analysis

Code and sub code developed based on the literature reviews of this research and develop code and sub code such as App performance- audio quality and self-support, facilitating conditions use of app online mode, offline mode, save time, App functionality- audio quality, easy to use App information quality- information relevant, authentic and sufficient. To know about reuse intention and issues faced by SGA users

3.19 Software Used for Content Analysis

Microsoft Word document and excel sheet software search and find option used. And 5-time manual reading done for accuracy in the result.

3.20 Chapter Summary

Chapter 3 discusses study methods, why convenience sampling was chosen, and what type of analysis was performed. What is the difference between sentiment analysis and content analysis? How user-generated content might benefit SGA developers and researchers. This chapter discusses the pilot study as well as the procedure of face and content validation by experts. Which will be beneficial for future study.

Chapter 4

Result and Discussion

4.1 Introduction

The purpose of the analysis is to arrange, categorise, and summarise the data that has been gathered in order to make it easier to understand and analyse it in order to provide answers to the research questions. Interpretation is the process of looking for a conclusion's deeper significance. Without interpretation, analysis is lacking, and without analysis, interpretation cannot happen. As a result, they are dependent on one another. Descriptive statistical analysis, inferential statistical analysis, and other statistical methods for analysing the data acquired for the current study are covered in this chapter.

4.2 Descriptive Statistical Analysis

According to Peak organizing and summing up the data is typically the next step in the data analysis process once data have been gathered or after a suitable data source has been identified. Increased knowledge is made possible through tables, graphs, and numerical summaries, which also serve as an effective means of presenting data. The area of statistics known as descriptive statistics deals with techniques for gathering and summarising data (peck et al.,2015).

Table 4.2.1 SGA Users Academic Qualifications

Academic Qualifications	SGA Users Frequency	Percentage
Up to Higher secondary School	47	7.4
Diploma	144	22.6
Under Graduate	358	56.1
Post Graduate	89	13.9
Total	638	100.0

Source: Survey data

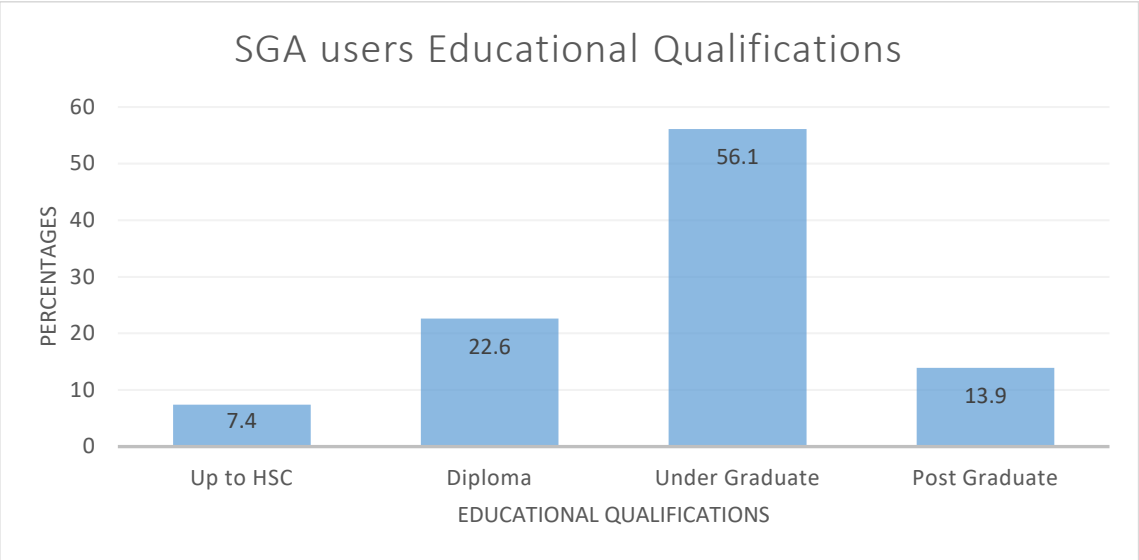


Fig. 4.2.1 Bar diagram represent educational qualification of SGA Users

According to the above table 4.2.1, 7.4% of SGA users respondents have an up to HSC qualification, 22.6% have a diploma, 56.1% are undergraduates, and 13.9 are postgraduates. However, the majority of respondents are students travelling for educational trip, so more than 50% of them hold undergraduate degrees.

Table no. 4.2.2.2 Male and Female Distribution of SGA Users

Gender of SGA Users	Frequency	Percentage
Male	439	68.8
Female	199	31.2
Total count and percentage	638	100.00

Source: Survey data

According to the above table, 68.8 % of SGA users are male and 31.2% participate SGA users are female.

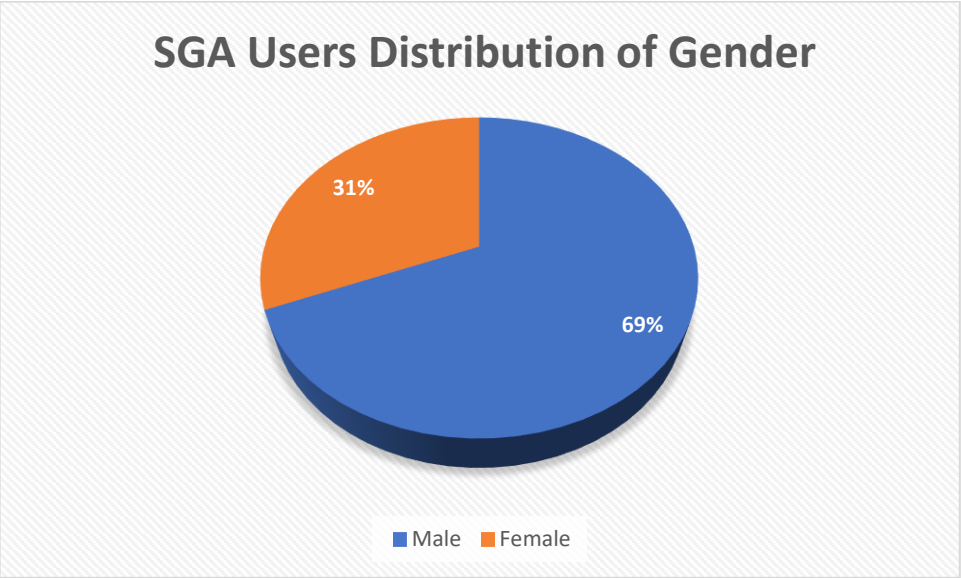


Fig. 4.2.2 Pie Chart of SGA Users Distribution of Gender

Table 4.2.3 Age Groups Frequency

Groups of Age	Frequency	Percentage
15 to 25	421	70.7
26 to 35	77	12.1
36 to 45	91	14.3
Above 45	19	3.0
Total	638	100

Source: Survey data

According to above table 4.2.3, 70.7% of SGA users are between the ages of 15 and 25; 12.1% are between 26 and 35; 14.3% are between the ages of 36 and 45; and only 3% are 45 years of age or older. It was discovered through data analysis that youngsters are SGA users.

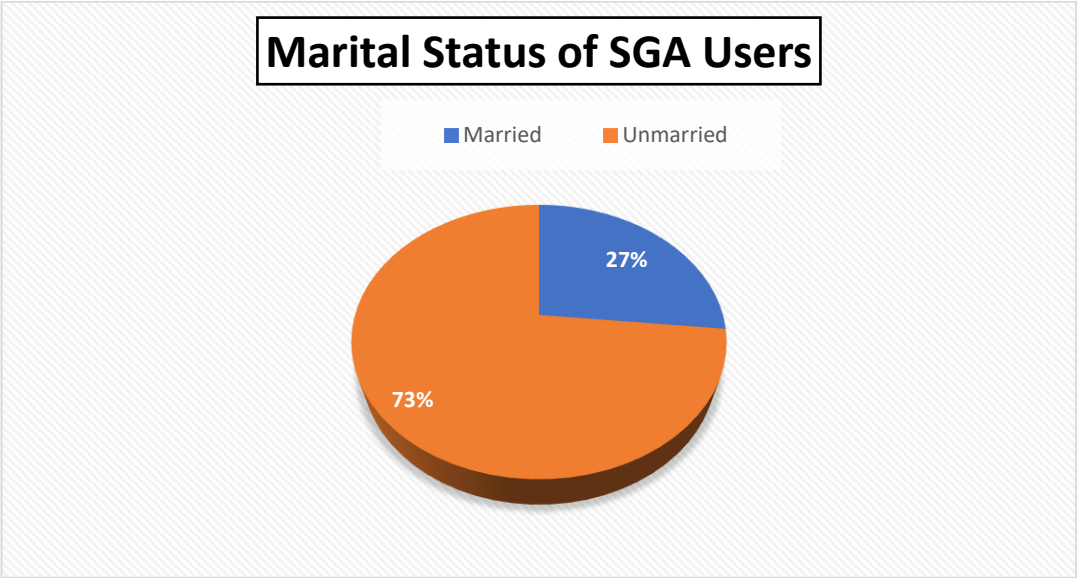


Fig. 4.2.3 Pie chart of Represent Marital Status

According to the pie chart above, 27% of SGA users are married, while 73% are unmarried.

Table 4.2.4 SGA Users Income Groups Distribution

Per Month Income in Thousands	Frequency	Percentage
No income	302	47.3
Below 24999	137	21.5
25000 to 49999	95	14.9
50000 to 74999	59	9.2
75000 and above	45	7.1
Total	638	100

Source: Survey data

In the 4.2.4, it can be seen that 47.3% SGA users do not have a source of income, 21.5% have monthly incomes of less than Rs 24,999, 14.9% have monthly incomes of between Rs 25,001 and Rs 49,000, and 9.2% have monthly incomes of between Rs 50,000 and Rs 74,999, or more than Rs 75,000 are 7.1 SGA users.

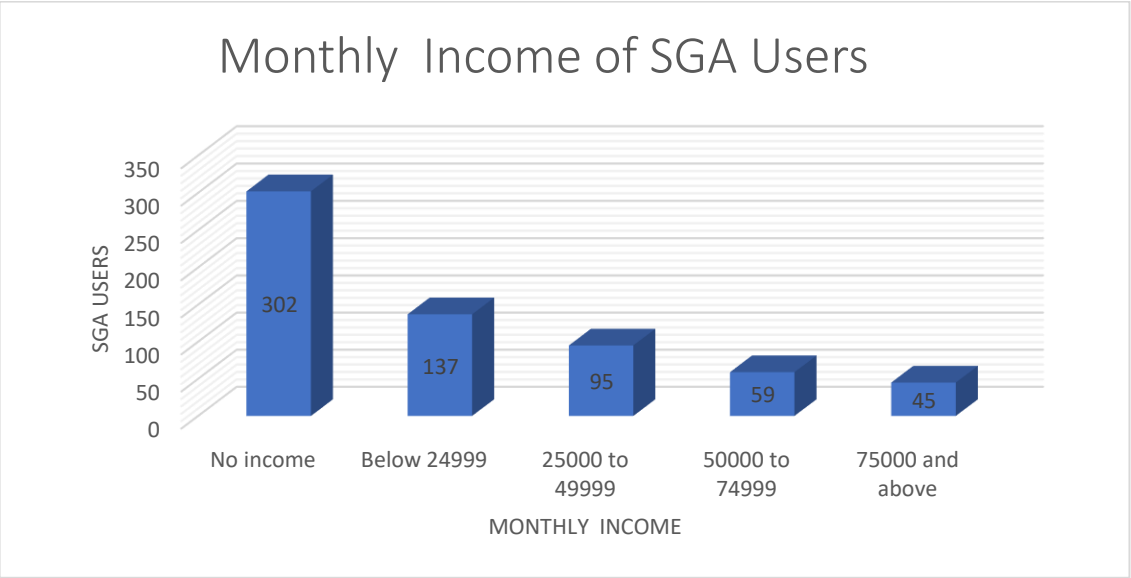


Fig 4.2.4 Monthly Income of SGA Users

Table 4.2.5 Frequency Occupation of SGA Users

Occupation	Frequency	Percentage
Students	284	44.5
Service	196	30.7
Business	140	21.9
Homemaker	18	2.8
Total	638	100

Source: Survey data

According to the table 4.2.5, 44.5% of SGA users are students, while 30.7 percent are in the services. 21.9% of SGA users are business owners, while 2.8% are homemakers.

Table 4.2.6 Use of SGA by Users

Use of SGA	Frequency	Percentage
Never	24	3.8
Once in Year	227	35.6
Twice in year	138	21.6
Always when I visit tourist sites	249	39.0
Total	638	100

Source: Survey data

Respondents provide answers to the question "I used the smart guide travel app." 3.8% of respondents had never used such an app. 35.6% used it once a year, 21.6% used it twice a year, and 39% used it whenever they were on tour.

Table 4.2.7 Experience of SGA Users Regarding Use of SGA

Years	Frequency	Percentage
Below 1	261	40.9
1-2	191	29.9
2-3	131	20.5
3-4	41	6.4
4 and above	14	2.2
Total	638	100.00

Source: Survey data

According to table 4.2.7 summary of the smart guide app user experience. 40.9% of respondents had less than a year of app use experience. 29.9% of users have been using the app from 1-2 years, 20.5% have been using it from 2-3 years, 6.4% have been using it from 3-4 years, and 2.2% have been using it over four years.

Table 4.2.8 Number of Users Used SGA Before Fill Responses in Past

Question	Response received
Have you used the smart guide app in the past? If the answer is yes, continue	638
Have you used the smart guide app in the past? If the answer is no, no need to continue	223
Total response received	861

Source: Survey data

According to table 4.2.8 total 861 SGA users participated in the research but according to the study sampling frame, those who have used SGA before response to questionnaire such filled responses are valid for this research. To confirm whether the respondent used the smart guide app before responding to the questionnaire after filling out the profile information question. Have you used the smart guide app in the past? If the answer is yes, continue; (Proceed Further) if the answer is no, stop. (No need proceeds further). However, 223 respondents agreed that they have not used Smart Guide App (SGA) in the past. and they have not processed further questions and such responses are not considered for analysis. In the above table, response to questions Have you ever used the SGA before answering a questionnaire? 74.1 percent said yes, while 25.9 percent said no. However, sample size for this research is 700 and a response fill by after SGA use such responses are valid response for this research. Total valid responses are 638 which is 91.14 % while comparing with 700 sample size.

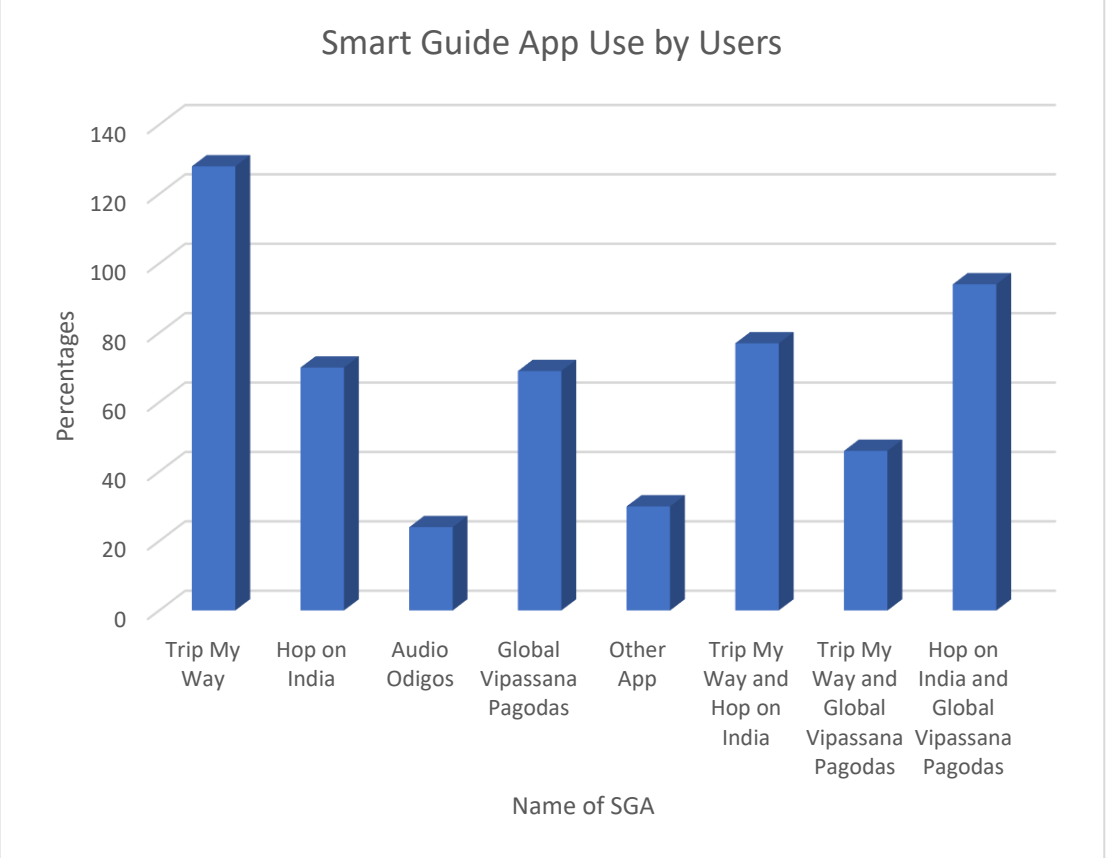


Fig 4.2.5 Bar Diagram Various SGA Used by SGA Users

Fig 4.2.5 Bar diagram, 638 SGA users used different SGA one or more than one. "Trip My Way App" was used by 128 respondents, “Hop on India App” was used by 70 SGA users, “Audio Odigoes” was used by 24, “Global Vipassana Pagoda App” was used by 69, and other apps are used by 30 SGA users. “Trip My Way App”, “Hop on India” both app users are 77, “Hop on India” and “Global Vipassana Pagoda App” used by 46 and “Trip My Way App” and “Global Vipassana Pagoda App” used by 94 SGA users.

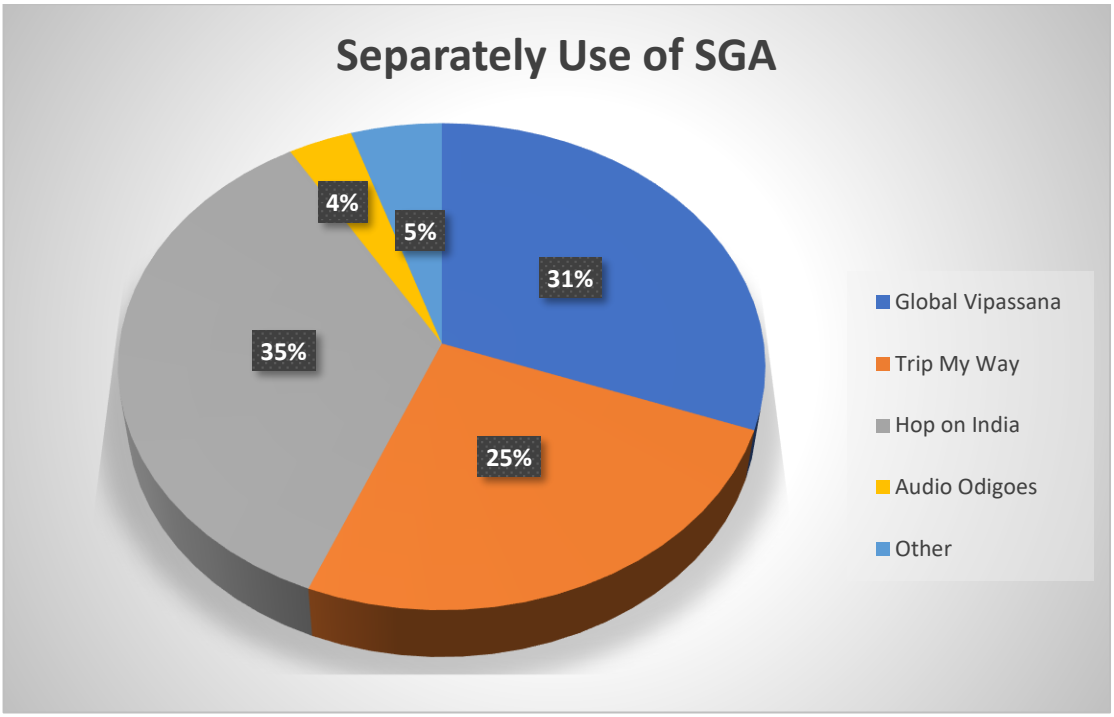


Fig 4.2.6 Pie Chart Use of Various Smart Guide App Separately

Figure 4.2.6 pie chart displays percentage of each SGA use by respondent users of this study. However, in the total 638 users, 241 SGA users used "Hop on India App" which is on top among the all apps with 35%. "Global Vipassana Pagoda App" was used by 31 percent user. The reason for the highest use of both apps is that the study area is Maharashtra, and both apps have destinations in Maharashtra. However, 174 SGA users used the “Trip My Way App”, 4% used the “Audio Odigos” app, and 5% used other app.

Table 4.2.9 Mean and Standard Deviation of all Measurements Items

Construct	All measurements item's	Mean	SD
App quality performance	Listen to audio and watch videos smoothly.	4.409	0.716
	Self-supporting tour guidance.	4.157	0.663
	Time saving	4.351	0.743
	Enhance effectiveness of tour.	4.160	0.670
	Overall performance while in use is superb.	4.417	0.703
App quality facilitating conditions	Able to use SGA on smartphone.	4.318	0.586
	SGA is completely free to use and download.	4.403	0.674
	SGA is available for use at a reasonable cost in paid options.	4.025	0.739
	SGA can use online and offline mode.	4.248	0.727
	Online support system availability	4.124	0.980
App quality functionality	SGA is easily accessible.	4.332	0.648
	Use SGA at any time and from any location.	4.343	0.634
	Sound quality was outstanding.	4.224	0.669
	Use SGA as my tour guide	4.367	0.609
	Operate SGA constantly for all available destinations in SGA.	4.252	0.709
App quality information quality	Multi Language function (National, International)	4.431	0.668
	Enough, Authentic, information about tour	4.459	0.696
	Information quality to encourages to use more of these SGA.	4.398	0.683
	SGA provide information for selected cities only	4.257	0.660
	Overall, the app's information quality was excellent.	4.329	0.655
App quality perceived	Using SGA requires less effort.	4.238	0.702
	Easily use SGA by users.	4.313	0.688

ease of use (PEOU)	Easily operatable	4.265	0.722
	SGA is interactive	3.466	1.368
	SGA is difficult to use.	3.688	1.102
App quality perceived usefulness (PU)	Assists in learning more about a tourist attraction.	4.274	0.659
	Save time to search for an authentic human guide.	4.346	0.678
	Tour guide fees are reduced after use SGA.	4.301	0.696
	Use of SGA speed up tour	4.350	0.676
	SGA provided a fantastic guided tour experience.	4.326	0.711
Attitude to use SGA	It's a good idea to use SGA.	4.255	0.628
	Using SGA made trip more memorable.	4.337	0.675
	The high quality of SGA encourages users to use it.	4.345	0.651
	SGA save tour guide expenses during tour	4.343	0.697
	Trust on SGA for use.	4.379	0.696
Intention to reuse SGA	Use SGA again during tour in the future.	4.285	0.695
	Use SGA to expand historical knowledge.	4.403	0.692
	Always use SGA to study a tourist destination.	4.386	0.640
	Use SGA to enhance experience of users	4.401	0.669
	Recommend SGA to friends and family of users	4.462	0.659

Source: Survey data

According to table 4.2.9, there are eight constructs and 40 items were used to measure them. A mean score of four or more indicates that the majority of the respondents are agree with the statement. However, it is discovered that the lowest mean score for SGA interactivity is 3.466, indicating that some SGA users believe SGA is not interactive. The second lowest mean score for SGA is difficult to use is 3.688, indicating that some SGA users believe SGA is difficult to use. Furthermore, the highest mean score is 4.462

for recommendation of SGA to friends and family of users, indicating that the majority of SGA users agree with this statement and will recommend the SGA. The second highest mean score is 4.459 for the sufficient, authentic, and relevant SGA information, and the majority of those surveyed agreed with this statement, indicating that SGA information is authentic. Similarly, 38 items have more than four mean scores, indicating that the majority of them are agreed upon.

Table 4.2.10 Mean and Standard Deviation of all Measurement's Constructs

Construct	**Mean**	**SD**
App quality performance	21.06	3.78
App quality facilitating conditions	20.74	3.28
App quality functionality	21.26	2.94
App information quality	21.59	3.44
Overall SGA app qualities	**84.64**	**12.59**
Perceived ease of use	19.68	4.31
Perceived usefulness	21.01	4.33
Attitude to use SGA	21.42	3.26
Intention to reuse SGA	21.80	3.05

Source: Survey data

According to table 4.2.9 and 4.2.10 means score of construct item, the most important app quality is app information quality (21.59), the second most important quality is app functionality (21.26), the third app quality performance (21.06), and the lowest mean for app quality facilitating conditions (20.74). It is because items such as apps can be used online or offline, and apps can be used for free or at a lower cost. However overall app quality means is (84.64). Moreover, among the all-construct intent to reuse app noted top most mean score (21.80) and perceived ease of use having poor mean score (19.68), it indicates that using app is not effort less.

Quartiles of SGA Users

The score can be converted into low, moderate, or high quartiles based on the quartile. Low level is defined as a score that is less than the first quartile (q1). If the result is A

moderate level is one that falls between the first and third quartiles (q1). If the score is higher than the third quartile (q3), it is considered high level, as shown in the table below.

Table 4.2.11 Level of SGA App Qualities

Level of SGA app qualities	Frequency	Percent
Low	162	25.4
Moderate	288	45.1
High	188	29.5
Total	638	100.00

Source: Survey data

Respondents' level of SGA app qualities. 29.5 percent of SGA users have high SGA qualities value, 45.1 percent have moderate SGA qualities value, and 25.4 percent have low SGA qualities value. According to the table 4.2.11, maximum of SGA respondent has moderate level for SGA qualities value. SGA users a moderate level of SGA qualities value indicates that app performance facilitating conditions, functionality, app information qualities.

Table 4.2.12 Level of PEOU

Level PEOU	Frequency	Percent
Low	181	28.4
Moderate	285	44.7
High	172	27.0
Total	638	100.00

Source Survey data

The above table illustrates the SGA users' level perceived ease of use. 27.0 percent of SGA users have high level of PEOU value, 44.7 percent have moderate level of PEOU value. 28.4 percent have low level of perceived ease of use value. According to the table, the majority of respondents have a moderate level of perceived ease of use value. SGA users a moderate level of PEOU value indicates that app performance facilitating conditions, functionality, app information qualities.

Table 4.2.13 Level of Perceived Usefulness

Level of perceived usefulness	Frequency	Percent
Low	182	28.5
Moderate	290	45.5
High	166	26.00
Total	638	100.00

Source survey data

Table 4.2.13 illustrated SGA users' level of perceived usefulness. 26.0 percent of SGA users have high level of perceived usefulness value, 45.5 percent have moderate level of perceived usefulness, and 28.5 percent have low level of perceived usefulness value. According to the table, the maximum SGA users have moderate level of perceived usefulness value. SGA users a moderate level of perceived usefulness value indicates that app performance facilitating conditions, functionality, app information qualities.

Table 4.2.14 Level of Attitude to Use SGA

Level of attitude to use SGA	Frequency	Percent
Low	179	28.1
Moderate	278	43.6
High	181	28.4
Total	638	100.00

Source: Survey data

Table 4.2.14 illustrates the SGA users level attitude to use SGA. 28.4 percent of SGA users have high level of attitude to use SGA value, 43.6 percent have moderate level of perceived usefulness, and 28.1 percent have low level of attitude to use SGA value. According to the table, the maximum of SGA users has moderate level of attitude to use SGA value. SGA users a moderate level of attitude to use SGA value indicates that app performance facilitating conditions, functionality, app information qualities.

Table 4.2.15 Level of Intention to Reuse SGA

Level of SGA App Qualities	Frequency	Percent
Low	173	27.1
Moderate	258	40.4
High	207	32.4
Total	638	100.00

Source: Survey data

The above table illustrates the SGA users' level of intention to reuse SGA. 32.4 percent of SGA users have high level of intention to reuse SGA value, 40.4 percent have moderate level of perceived usefulness, and 27.1 percent have low level of intention to reuse SGA value. According to the table, the majority of SGA users have a moderate level of intention to reuse SGA value. SGA users a moderate level of intention to reuse SGA value indicates that app performance facilitating conditions, functionality, app information qualities.

4.3 Inferential Analysis

"Inferential statistics are procedures that allow researchers to extrapolate or generalise findings from samples to the larger population from which they were drawn." Inferential statistics are used to assist researchers in determining how well statistics in a sample reflect population parameters (Nayak & Singh, 2020). This section given result of various test such as ANOVA, t test, CFA, SEM, Chi-square test, Regression, correlation and so on.

Table 4.3.1 t test

Constructs	Gender				t value	P value
	Male		Female			
	Mean	SD	Mean	SD		
Performance	21.29	3.59	20.55	4.11	2.299	0.022*
Facilitating conditions	21.00	3.08	20.18	3.63	2.948	0.003**
Functionality	21.48	2.75	20.76	3.28	2.879	0.004**
App information	21.82	3.22	21.07	3.83	2.570	0.010**

Overall SGA app qualities	**85.59**	**11.74**	**82.56**	**14.09**	**2.834**	**0.005****
Perceived ease of use	19.87	4.18	19.28	4.55	1.615	0.107
Perceived usefulness	21.25	4.12	20.48	4.74	2.086	0.037*
Attitude to use SGA	21.67	2.99	20.88	3.72	2.822	0.005**
Intention to reuse SGA	22.06	2.86	21.24	3.37	3.180	0.002**

Source: Survey data

**** Indicate significant at 1% level**

*** Indicate significant at 5% level**

With regard to the research hypothesis, and result of t test, to know gender significance difference with regards to all variables and overall SGA quality. Value of P is smaller than 0.01, indicating that there is significance difference at 1% level between male and female SGA users with regards constructs Facilitating conditions, Functionality, App information, Overall SGA app qualities, Attitude to use SGA, Intention to reuse SGA. Hence there is significant difference with regards Facilitating conditions, Functionality, App information, Overall SGA app qualities, Attitude to use SGA, Intention to reuse SGA. Based on mean score Male SGA users have better in Facilitating conditions, Functionality, App information, Overall SGA app qualities, Attitude to use SGA, Intention to reuse SGA.

Given that the P value is smaller than 0.05, there is a significant difference between males and females at the 5% level. SGA users with regards constructs SGA performance, Perceived usefulness based on mean score Male SGA users have better in SGA performance, Perceived usefulness.

Regarding PEOU, there is no statistically significant difference between male and female SGA users at the 5% level. P value is greater than 0.05, thus. There is no discernible difference in PEOU between male and female SGA users. Perceived ease of use is correlated with SGA PEOU, placing them at the same level.

ANOVA Analysis

ANOVA is known as Analysis of variance as is a very useful technique in many other types of research. When there are multiple sample cases, this technique is used. As previously stated The ANOVA technique is crucial in any cases where we want to compare more than two populations, such as when comparing the agricultural yield from various seed kinds, the gas mileage of four cars, etc. (Kothari, 2006).

With reference to research variable examination age group of respondent opinion difference on various variables of study therefore one way ANOVA is used to investigate differences between age group.

Table 4.3.2 ANOVA Analysis of Age Groups of SGA Users

Constructs	**Groups of Age**				**F value**	**P value**
	Up to 25	26-35	36-45	Above 45		
Performance	21.01[b] (3.90)	21.09 [b] (3.35)	21.88 [b] (2.65)	18.11[a] (5.39)	5.448	<0.001**
Facilitating conditions	20.72 [b] (3.37)	20.56 [b] (2.91)	21.5 [b] 1 (2.26)	18.32[a] (5.21)	5.295	<0.001**
Functionality	21.28 [b] (3.01)	21.10 [b] (2.67)	21.70 [b] (2.18)	19.16[a] (4.48)	4.069	0.007**
App information	21.72 [b] (3.50)	20.97 [b] (3.27)	22.07 [b] (2.60)	18.74 [a] (4.66)	6.110	<0.000**
Overall SGA app qualities	**84.73** [b] **(12.86)**	**83.73** [b] **(11.59)**	**87.15** [b] **(9.06)**	**74.32** [a] **(18.73)**	**5.737**	**<0.001****

Perceived ease of use	19.84 [b] (4.46)	19.77 [b] (3.59)	19.47 [b] (3.52)	16.74 [a] (5.75)	3.276	0.021*
Perceived usefulness	21.12 [b] (4.33)	21.04 [b] (3.52)	21.59 [b] (3.32)	15.68 [a] (7.60)	10.667	<0.000**
Attitude to use SGA	21.49 [b] (3.34)	21.13 [b] (2.83)	21.93 [b] (2.45)	18.53 [a] (4.59)	6.182	<0.000**
Intention to reuse SGA	21.89 [b] (3.13)	21.47 [b] (2.96)	22.10 [b] (2.42)	19.63 [a] (3.37)	3.987	0.008**

Source: Survey data
Note values mention in the ( ) refer to SD

**** Indicate 1% level of significant**

*** Indicate 5% level of significant**

Alphabet among the age groups shows significant at 5% level according to DMRT

A one-way ANOVA test was carried out to determine age group differences on the variable of study. According to the above table 4.3.2 Smaller P value than 0.01, indicating that there is significance difference at level of 1% with regards to the Performance, facilitating conditions, Functionality, App information, Overall SGA app qualities, Perceived usefulness, Attitude to use SGA, Intention to reuse SGA. Hence there is significant difference between SGA users Age groups with regards to Performance, facilitating conditions, Functionality, App information, Overall SGA app qualities, Perceived usefulness, Attitude to use SGA, Intention to reuse SGA.

According to Duncan Multiple Range Test (DMRT) SGA users age group up to 25, age group 26 to 35, age group 36 to 45 significance difference with age group above 45 at 5% significant level in Performance, facilitating conditions, Functionality, App information, Overall SGA app qualities, PU, Attitude to use SGA, Intention to reuse

SGA. However, there is no discernible difference in SGA user ages up to 25, 26 to 35, and 36 to 45.

Smaller P value less than 0.05, indicating that there is significance difference at 5% level with regards Perceived ease of use. Hence there is significance difference between SGA users Age groups with regards to Perceived ease of use. Based on DMRT SGA users age group up to 25, age group 26 to 35, age group 36 to 45 significance difference with age group above 45 at 5% significant level in PEOU. However, there is no statistically significant distinction between SGA user age groups up to 25, 26 to 35, and 36 to 45. However, PEOU plays an important role in app retention. According to the UTAUT, individual characteristics like age and gender may modify the associations between situational variables and technology adoption and use (Barnett et al., 2015). Age groups above 45 found significant differences with other age groups it was indicated SGA ease of use was influenced by age.

4.4 Chi square test

Chi-square is an effective data analysis method that exposes a great deal about the nature of research data. This is a robust statistical method that enables researchers to assess hypotheses involving nominally measured variables. Like all inferential statistics, the most credible outcomes are achieved when data is collected from randomly chosen individuals, and the sample sizes are sufficiently large to ensure adequate statistical power. In cases where assumptions such as equal variances and homoscedasticity are violated, rendering parametric statistics like the t-test and ANOVA unreliable, the Chi-square test becomes a valuable tool to utilize. (Mchugh, 2013). However, for the Chi-Square test applied for study research hypothesis.

H1App qualities are positively associated with PEOU of SGA and positively influence on attitude towards use of SGA.

Table 4.4.1 Chi Square Test for Association Between App Qualities and PEOU

Level SGA app qualities	**Level of PEOU**			**Total**	**Chi-square**	**P value**
	Low	Moderate	High			

Low	76 (46.9) [42.0]	71 (43.0) [24.9]	15 (9.3) [8.7]	162 (100.0) [25.4]	79.202	<0.000**
Moderate	79 (27.4) [43.6]	138 (47.9) [48.4]	71 (24.7) [41.3]	288 (100.0) [45.1]		
High	26 (13.8) [14.4]	76 (40.4) [26.7]	86 (45.7) [50.0]	188 (100.0) [29.5]		
Total	181 (28.4) [100.0]	285 (44.7) [100.0]	172 (27.0) [100.0]	638 (100.0) [100.0]		

Source: Survey data

Note Values in () represent row percentage

Values in [ ] represent column percentage

**** Indicates 1% significant level**

The P value is less than 0.01, hence hypothesis 1 is accepted at the 1% level of significance. Hence, it is determined that there is an association between app qualities and PEOU. According to table 4.4.1 row percentage, if the app qualities level is low then 46.9 percent, SGA users have low level of PEOU, 43.0 SGA users have moderate level of PEOU and only 9.3 percent SGA users have high level of PEOU.

Hence, if users have high levels of SGA quality, they also have higher levels of PEOU. It is concluded from table 4.4.1 that SGA app qualities value positively influences PEOU. However, research findings match with this mentioned research. Attitude towards using self-service hotel technology is positively influenced by perceived ease of use for adoption of new technology (Kaushik et al., 2015). App information quality has a great impact on the intention to use app based mobile tour guide (Lai, 2013). By recommending an integrative method for anticipating behavioural intentions towards travel apps, technical attributes are shown impact on tourists' adoption and intends to use mobile apps (Lu et al., 2015). Reference to table 4.4.3 illustrate more about the hypothesis.

H2 App qualities are positively associated with PU of SGA and positively influence attitude towards use of SGA

Table 4.4.2 Chi Square Test for Association Between app qualities and PU

Level of SGA app qualities	**Level of perceived usefulness**			**Total**	**Chi-Square**	**P value**
	Low	Moderate	High			
Low	85 (52.5) [46.7]	60 (37.0) [20.7]	17 (10.5) [10.2]	162 (100.0) [25.4]	114.769	<0.000**
Moderate	74 (25.7) [40.7]	156 (54.2) [53.8]	58 (20.1) [34.9]	288 (100.0) [45.1]		
High	23 (12.2) [12.6]	74 (39.4) [25.5]	91 (48.4) [54.8]	188 (100.0) [29.5]		
Total	182 (28.5) [100.0]	290 (45.5) [100.0]	166 (26.0) [100.0]	638 (100.0) [100.0]		

Source: Survey data

Note Values in ( ) represent the row percentage

Values in [ ] represent the column percentage

**** Indicates 1% significant level**

The P value is less than 0.01, hence hypothesis 2 is accepted at the 1% level of significance. Hence, it is determined that there is an association between SGA app qualities and Perceived usefulness. According to table 4.4.2 row percentage, if the app qualities level is low then 52.5 percent, SGA users have low level of perceived

usefulness, 37.0 percent users have moderate level of perceived usefulness and only 10.5 percent SGA users have high level of perceived usefulness.

Hence, if users have high levels of SGA quality apps, they also have high levels of perceived usefulness of SGA. We can conclude from the table 4.4.2 that SGA app qualities value positively influences perceived usefulness of SGA. When tourists make use of mobile app guide applications. The findings revealed that travellers view the use of mobile guide services by using the device's functions, transforming the services into an incredible experience, and then feeling uniqueness and a warm about offered services. App qualities have positive impact on users intention (Chuang, 2020). Furthermore, discussion about hypothesis 2 along with table 4.4.3.

H3 App qualities have positive influence on attitude towards the use of SGA and are positively associated with intention to reuse

Table 4.4.3 Chi Square Test for Association Between app Qualities and Attitude to Use SGA

Level of SGA app qualities	**Level of attitude to use SGA**			**Total**	**Chi-Square**	**P value**
	Low	Moderate	High			
Low	82 (50.6) [45.8]	65 (40.1) [23.4]	15 (9.3) [8.3]	162 (100) [25.4]	95.420	<0.000**
Moderate	78 (27.1) [43.6]	132 (45.8) [47.5]	78 (27.1) [43.1]	288 (100.0) [45.1]		
High	19 (10.1) [10.6]	81 (43.1) [29.1]	88 (46.8) [48.6]	188 (100.0) [29.5]		
Total	179 (28.1) [100.0]	278 (43.6) [100.0]	181 (28.4) [100.0]	638 (100.0) [100.0]		

Source: Survey data

Note Values in ( ) represent row percentage

Values in [ ] represent column percentage

**** Indicates 1% significant level**

The P value is smaller than 0.01, hence hypothesis 3 is accepted at the 1% level of significance. Hence, it is determined that there is an association between app qualities and attitude to use SGA. According to table 4.4.3 row percentage, if the app qualities level is low then 50.6 percent, SGA users have low level of attitude use SGA, 40.1 percent users have moderate level of attitude to use SGA and only 9.3 percent SGA users have high level of attitude to use SGA.

Hence, if users have high levels of SGA app qualities, they also have high levels of attitude to use SGA. We can conclude from table 4.4.3 that SGA app quality value positively influences attitude to use SGA. A positive impact facilitating condition on users, how they support it (Palos et al., 2020). Positive impact of app quality on users' attitudes. Adoption intention is positively related to attitude and involvement (Fang et al., 2017). User engagement with smartphone travel apps is significantly influenced by "system", and "service quality," "information". Furthermore, user engagement has a positive and significant impact on smartphone app satisfaction, love, and behavioural intention (Ali et al., 2021). Mentioned study supported to Hypothesis 3 for app qualities are strongly associated with attitude to use SGA and positively influenced on reuse intention of SGA. Furthermore, about Hypothesis 3 discussed with table 4.4.4

Table 4.4.4 Chi Square Test for Association Between App Qualities and Intention to Reuse SGA

Level of SGA app qualities	**Level of intention to reuse SGA**			**Total**	**Chi-Square**	**P value**
	Low	Moderate	High			
Low	96 (59.3) [55.5]	56 (34.6) [21.7]	10 (6.2) [4.8]	162 (100.0) [25.4]		

Moderate	59 (20.5) [34.1]	125 (43.4) [48.4]	104 (36.1) [50.2]	288 (100.0) [45.1]		
High	18 (9.6) [10.4]	77 (41.0) [29.8]	93 (49.5) [44.9]	188 (100.0) [29.5]	142.195	<0.000**
Total	173 (27.1) [100.0]	258 (40.4) [100.0]	207 (32.4) [100.0]	638 (100.0) [100.0]		

Source: Survey data

Note Values in ( ) represent row percentage

Values in [ ] represent column percentage

**** Indicates 1% significant level**

The P value is smaller than 0.01, hence hypothesis 3 is accepted at the 1% level of significance. Hence, it is determined that there is a connection between app qualities and intention to reuse SGA. According to table 4.4.4 row percentage, if the app qualities level is low then 59.3 percent, SGA users have low level of intention to reuse SGA, 34.6 percent users have moderate level of intention to reuse SGA and 6.2 percent SGA users feel high level of intention to reuse SGA.

Hence, if users have high levels of SGA app qualities, they also have high levels of Intention to reuse SGA. We can conclude from the table that SGA app quality value positively associated with intention to reuse SGA.

H4 PEOU is positively influence on attitude towards use of SGA

Table 4.4.5 Chi Square Test for Association between PEOU and Attitude to Use SGA

Level of PEOU	**Level of Attitude to use SGA**			**Total**	**Chi-Square**	**P value**
	Low	Moderate	High			

Low	86 (47.5) [48.0]	63 (34.8) [22.7]	32 17.7 [17.7]	181 100.0 [28.4]		
Moderate	74 (26.0) [41.3]	147 (51.6) [52.9]	64 (22.5) [35.4]	285 (100.0) [44.7]		
High	19 (11.0) [10.6]	68 (39.5) [24.5]	85 (49.4) [47.0]	172 (100.0) [27.0]	88.300	<0.000**
Total	179 (28.1) [100.0]	278 (43.6) [100.0]	181 (28.4) [100.0]	638 (100.0) [100.0]		

Source: Survey data

Note Values in ( ) represent row percentage

Values in [ ] represent column percentage

**** Indicates 1% significant level**

The P value is smaller than 0.01, hence hypothesis 4 is accepted at the 1% level of significance. Hence, it is determined that there is an association between level of PEOU and attitude to use SGA. According to table 4.4.5 row percentage, if the PEOU level is low then 47.5 percent, SGA users have low level of attitude to use SGA, 34.8 users have moderate level of attitude to use SGA and only 17.7 percent SGA users have high level of attitude to use SGA.

Hence, if users have high levels of SGA PEOU, they also have high levels of attitude to use SGA. We can conclude from the table that SGA PEOU value positively influences attitude to use SGA. The core concepts of the technology acceptance model, PU and PEOU, have a big influence on how people feel about using technology, which affects how they behave in terms of their intention to use technology (Ko et al., 2019). However, this study supported hypothesis 4 and 5.

H5 PU is positively influence on attitude towards use of SGA

Table 4.4.6 Chi Square Test for Association Between PU and Attitude to Use SGA

Level of PU	Level of Attitude to Use SGA			Total	Chi square	P value
	Low	Moderate	High			
Low	84 (46.2) [46.9]	74 (40.7) [26.6]	24 (13.2) [13.3]	182 (100.0) [28.5]	92.646	<0.000**
Moderate	79 (27.2) [44.1]	140 (48.3) [50.4]	71 (24.5) [39.2]	290 (100.0) [45.5]		
High	16 (9.6) [8.9]	64 (38.6) [23.0]	86 (51.8) [47.5]	166 (100.0) 26.0]		
Total	179 (28.1) [100.0]	278 (43.6) [100.0]	181 (28.4) [100.0]	638 (100.0) [100.0]		

Source: Survey data

Note Values in ( ) represent row percentage

Values in [ ] represent column percentage

**** Indicates 1% significant level**

The P value is smaller than 0.01, hence hypothesis 5 is accepted at the 1% level of significance. Hence, it is determined that there is an association between SGA PU and attitude to use SGA. According to table 4.4.6 row percentage, if the PU level is low then 46.2 percent, SGA users have low level value of attitude to use SGA, 40.7 percent users have moderate level of attitude to use SGA and only 13.2 percent SGA users have high level of attitude to use SGA.

Hence, if users have high levels of SGA PU, they also have high levels of attitude to use SGA. We can conclude from the table that SGA perceived usefulness value positively influences attitude to use SGA PU and PEOU are fundamental constructs in the technology acceptance model that have a significant impact on attitude toward technology use (Ko et al., 2019). Based on a study conducted by Chuang C, it was found

that travellers' perception of the usefulness of mobile app guide services positively impacts both their usage context and their intention to make a purchase. (Chuang, 2020). However previous research supported for SGA study.

H6 Positive attitude towards SGA is positively influencing the reuse intention.

Table 4.4.7 Chi Square Test for Association Between Attitude to Use and Intention to Reuse SGA

Level of Attitude to Use SGA	**Level of Intention to Reuse SGA**			**Total**	**Chi square**	**P value**
	Low	Moderate	High			
Low	90 (50.3) [52.0]	58 (32.4) [22.5]	31 (17.3) [15.0]	179 (100.0) [28.1]	78.606	<0.000**
Moderate	47 (16.9) [27.2]	135 (48.6) [52.3]	96 (34.5) [46.4]	278 (100.0) [43.6]		
High	36 (19.9) [20.8]	65 (35.9) [25.2]	80 (44.2) [38.6]	181 (100.0) [28.4]		
Total	173 (27.1) [100.0]	258 (40.4) [100.0]	207 (32.4) [100.0]	638 (100.0) [100.0]		

Source: Survey data

Note Values in ( ) represent row percentage

Values in [ ] represent column percentage

**** Indicates 1% significant level**

The P value is smaller than 0.01, hence hypothesis 6 is accepted at the 1% level of significance. Hence, it is determined that there is an association between SGA attitude to use SGA and intention to reuse SGA. According to table 4.4.7 row percentage, if the attitude to use SGA level is low then 50.3 percent, SGA users have low level of intention

to reuse SGA, 32.4 percent users feel moderate level of intention to reuses SGA and only 17.3 percent SGA users feel high level of intention to reuse SGA.

Hence, if users have high levels of SGA attitude to use SGA, they also have high levels of reuse intention to use SGA. We can conclude from the table that attitude to use SGA value positively influences intention to reuse SGA. The app quality has positive intention towards use app and positively influence reuse intention based on experience (Liu et al., 2020a). Choi et al., on the other hand, look into what influences people's decisions to keep using travel-related mobile apps. New technologies have already been "accepted" by tourists, thus the emphasis of research must switch from "adoption" to "continuous use." Mobile apps are commonly downloaded, stored, and then utilised just once on portable devices (Choi et al., 2018).

4.5 Reliability and Validity of Items

This research conducted Pilot study and during that reliability and validity of items done and detail mention in Chapter number 3. The introduction of Cronbach's Alpha in 1951 by Cronbach. The correlation between various test items is the foundation for an instrument's internal consistency. This correlation assesses the degree of similarity in outcomes among multiple items designed to gauge the same underlying concept. It is calculated by examining the correlations between all possible pairs of items for Cronbach's Alpha. It is widely accepted that a value falling between 0.6 and 0.7 represents an acceptable level, while a value between 0.8 and higher signifies a very good level of consistency. However, values exceeding 0.95 may suggest redundancy (Ursachi et al., 2015). Furthermore table 4.5.2 indicate values of Composite reliability, Convergent validity, Discriminant validity which all are met with acceptable criteria CR > 0.7(Composite reliability is met), AVE > 0.5 (Convergent validity is met), MSV < AVE (Discriminant validity is met.) (Hair et al.,2009).

Table 4.5.1 Reliability of Items

Construct	Items	Cronbach Alpha
Performance	5	0.723
Facilitating conditions	5	0.704
Functionality	5	0.695

Information Quality	5	0.793
PEOU	5	0.764
PU	5	0.780
Attitude to use SGA	5	0.822
Intention to reuse SGA	5	0.824

Source: Survey data

Table 4.5.2 Composite reliability, Convergent Validity and Discriminant validity

Note: CR > 0.7(Composite reliability is met), AVE > 0.5 (Convergent validity is met),

	CR	AVE	MSV	1	2	3	4	5	6	7	8
Performance	0.731	0.535	0.454	**0.731**							
Facilitating conditions	0.722	0.515	0.486	0.583	**0.718**						
Functionality	0.705	0.501	0.490	0.652	0.703	**0.708**					
Information Quality	0.814	0.585	0.490	0.632	0.668	0.695	**0.765**				
PEOU	0.786	0.570	0.470	0.622	0.678	0.628	0.659	**0.755**			
PU	0.789	0.575	0.505	0.677	0.655	0.693	0.633	0.680	**0.758**		
Attitude to use SGA	0.822	0.590	0.510	0.701	0.695	0.626	0.685	0.677	0.665	**0.768**	
Intention to reuse SGA	0.826	0.610	0.518	0.722	0.665	0.658	0.680	0.690	0.698	0.687	**0.781**

MSV < AVE (Discriminant validity is met.).

1Performance, 2 Facilitating conditions, 3 Functionality, 4 Information Quality, 5 PEOU (Perceived ease of use), 6 PU (Perceived usefulness), 7 Attitude to use SGA, Intention to reuse SGA

4.6 Pearson Correlation Coefficient

Correlation coefficients are used to depict the strength and direction of a connection between variables. Pearson correlation, for instance, quantifies the linear association between two variables that follow a normal distribution. These coefficients are scaled from -1 to +1, with 0 suggesting no linear or monotonic connection, and 1 signifying a stronger and positive relationship (Schober & Schwarte, 2018).

Table 4.6.1 Pearson Correlation Coefficient Between factors of App Qualities

SGA Qualities	**Performance**	**Facilitating Conditions**	**Functionality**	**App Information**
Performance	1.000	0.831**	0.847**	0.871**
Facilitating Conditions	-	1.000	0.825**	0.798**
Functionality	-	-	1.000	0.845**
App Information	-	-	-	1.000

Source: Survey data

Note **Significant level of correlation at 0.01 (2- tailed)

The correlation coefficient between app qualities performance and facilitating conditions is 0.831, indicating an 83.1 percent positive correlation that is significant at the 1% level. The correlation coefficient between app qualities performance and functioning is 0.847, which indicates a substantial (significant at the 1% level) 84.7 percent positive association between the two. The correlation coefficient between app quality performance and app information is 0.871, indicating a substantial (significant at the 1% level) 87.7% positive link between performance and app information quality. Similar to how these factors are related to one another

Table 4.6.2 Pearson Correlation Between PEOU, PU Attitude to Use SGA, Intention to Reuse SGA

Variables	PEOU	PU	Attitude to use SGA	Intention to reuse SGA
PEOU	1.000	0.730**	0.778**	0.702**
PU	-	1.000	0.844**	0.779**
Attitude to use SGA	-	-	1.000	0.795**
Intention to reuse SGA	-	-	-	1.000

Source: Survey data

Note **Significant level of correlation at 0.01 (2- tailed)

The correlation coefficient between PEOU and PU is 0.730, demonstrating a strong positive connection of 73 percent between these two factors. This relationship is highly significant at the 1% level. Likewise, the correlation coefficient between PEOU and attitude toward using SGA is 0.778, indicating a substantial positive correlation of 77.8 percent between PEOU and Attitude to Use SGA, and this relationship is also statistically significant at the 1% level. Furthermore, the correlation coefficient between PEOU and the intention to reuse SGA is 0.702, suggesting a statistically significant positive association of 70.2% between these two variables. Similar patterns of positive correlation are observed among other variables as well.

Table 4.6.3 Pearson Correlation Coefficient Between Factor of SGA Qualities PEOU, PU, Attitude to use SGA, Intention to Reuse SGA

SGA Qualities	PEOU	PU	Attitude to use SGA	Intention to reuse SGA
Performance	0.751**	0.808**	0.840**	0.831**
Facilitating conditions	0.779**	0.780**	0.815**	0.734**
Functionality	0.744**	0.794**	0.829**	0.798**
App information	0.729**	0.785**	0.840**	0.861**

Overall SGA qualities	0.707**	0.771**	0.754**	0.748**

Source: Survey data

Note **Significant level of correlation at 0.01 (2- tailed)

Based on the information provided in the table 4.6.3, it is evident that the SGA quality factors exhibit significant correlations with PEOU, PU, attitude towards using SGA, and the intention to reuse SGA. The correlation coefficient between the overall SGA qualities and PEOU is 0.707, indicating a strong 70 percent positive association between overall SGA qualities and PEOU, which is statistically significant at the 1% level. Similarly, the correlation coefficient between overall SGA qualities and PU is 0.771, signifying a robust 71.1 percent positive link between the perception of overall SGA qualities and perceived usefulness, which is also statistically significant at the 1% level. The correlation coefficient of 0.754 between overall SGA qualities and attitude towards using SGA reveals a strong positive relationship of 75.4 percent between these two variables. This relationship is highly significant at the 1% level.

The correlation coefficient between of Overall SGA qualities and Intention to reuse SGA is 0.748, indicate a 74.8 percent positive relationship between overall SGA qualities and intention to reuse SGA that is significant at the 1% level.

4.7 Multiple Regression Analysis

Regression is a statistical procedure employed to establish a connection between two or more variables. In simple regression, the focus is on two variables, where one independent variable influences the behaviour of another (dependent variable). When there are more than two independent variables involved, this analysis is referred to as multiple correlations, and the equation that describes the relationship is termed the multiple regression equation. The primary objective of regression analysis is to construct a reliable mathematical expression that allows us to compute the values of a dependent variable (DV) based on the values of one or more independent variables (IVs). As such, it aims to explore how a variable, denoted as Y, interacts with a multitude of other variables. X_1, X_2, X_3, ……X_n. the most commonly used linear equation in $Y=b_1 X1 + b_2 X_2 +……+ b_n X_n + b_0$

Y is the dependent variable that must be discovered in this case. The known variables with which predictions are to be made are X_1, X_2,..., and Xn, and the coefficients of the variables are b_1, b_2,....bn.

The dependent variable in this study is perceived ease of use, and the independent variables are performance, facilitating conditions, functionality, information quality, and analysis, which are discussed below:

Multiple Regression Analysis of App Qualities on PEOU

Dependent variable : Perceived ease of use (Y)

Independent variables : 1. Performance (X_1)

2. Facilitating conditions (X_2)

3. Functionality (X_3)

4. Information Quality (X_4)

Multiple R value : 0.809

R Square value : 0.654

F value : 299.061

P value : <0.000**

Table 4.7.1 Variables in the Multiple Regression Analysis

Variables	**Unstandardized co-efficient**	**SE of B**	**Standardized co-efficient**	**t value**	**P value**
Constant	-3.765	0.758	-	-4.970	<0.000**
Performance (X_1)	0.202	0.063	0.177	3.185	0.002**

Facilitating conditions (X_2)	0.540	0.061	0.411	8.858	<0.000**
Functionality (X_3)	0.235	0.075	0.160	3.127	0.002**
Information Quality (X_4)	0.140	0.066	0.111	2.120	0.034*

Source: Survey data

**** Indicate 1% significant level**

The multiple correlation coefficient of 0.809 measures the degree of association between the PEOU actual and projected values of app qualities. When the predicted values are obtained as a linear combination of Performance (X_1), Facilitating conditions (X_2), Functionality (X_3), Information Quality(X_4), the coefficient value of 0.809 suggests that the association between perceived ease of use and the Four IV is quite strong and positive.

The coefficient of determination, often referred to as R-square, assesses the quality of fit of the estimated Sample Regression Plane (SRP) by measuring the percentage of variation in the dependent variables that can be accounted for by the fitted sample regression equation.

The R square value of 0.654 simply means that the predicted SRP that includes Performance, facilitating conditions, Functionality, Information Quality as independent variables explains around 65.4% of the variation PEOU, and the R square value is significant at the 1% level.

The multiple regression equation is

$$Y = -3.765+ 0.202X_1 + 0.540 X_2 + 0.235X_3 + 0.140X_4$$

The coefficient of X_1 is 0.202, which shows the partial effect of SGA performance on Perceived ease of use while holding the other variables constant. The projected positive sign indicates that such an effect is positive, with Perceived ease of use increasing by

0.202 for every unit rise in SGA performance, and this coefficient value is significant at the 1% level.

The coefficient of X_2 is 0.540 indicates the partial effect of facilitating conditions on Perceived ease of use, holding the other variables as constant. The estimated positive sign indicates that such an effect is positive, with perceived ease of use increasing by 0.540 for every unit rise in facilitating conditions, and this coefficient value is significant at the 1% level.

The coefficient of X_3 is 0.235 indicates the partial effect of Functionality on Perceived ease of use, holding the other variables as constant. The estimated positive sign indicates that such an effect is positive, with perceived ease of use increasing by 0.235 for every unit rise in Functionality, and this coefficient value is significant at the 1% level.

The coefficient of X_4 is 0.140 indicates the partial effect of Information Quality on Perceived ease of use, holding the other variables as constant. The estimated positive sign indicates that such an effect is positive, with perceived ease of use increasing by 0.140 for every unit rise in Information Quality, and this coefficient value is significant at the 1% level.

Based on standardized coefficient Facilitating conditions (0.411), is the most important factors extract perceived ease of use followed by performance (0.177) Functionality (0.160), Information Quality (0.111). Several recent studies have also discovered that facilitating conditions are related to users' PEOU. Convenient conditions increased perceived ease of use Facilitating conditions are more likely to perceive augmented reality as more user-friendly (Ko et al., 2019). According to Sanchez and Argila, for a more comprehensive analysis of travel app adoption and to explore whether another theoretical model might be better suited for examining variables like facilitating conditions and innovativeness, future studies should consider employing this type of model when researching tourism applications (Sánchez-torres & Argila-irurita, 2021). The extent to which an individual perceives that using a specific system would require minimal effort(Lescevica et al., 2013). However, users feel how easy to use SGA based on facilitating condition in SGA, in terms of online or offline use mode, what kind of mobile version support required, user can use SGA free of cost or need to purchase.

Multiple Regression Analysis of App Qualities on Perceived Usefulness

The DV in this study is PU, and the independent variables are performance, facilitating conditions, functionality, information quality, and analysis, which are discussed below:

Dependent variable : Perceived usefulness (Y)

Independent variables : 1. Performance (X_1)

2. Facilitating conditions (X_2)

3. Functionality (X_3)

4. Information Quality (X_4)

Multiple R Value : 0.846

R Square : 0.715

F Value : 397.742

P value : <0.000**

Table 4.7.2 Variables in the Multiple Regression Analysis

Variables	**Unstandardized Co- efficient**	**SE of B**	**Standardized Co- efficient**	**t value**	**P value**
Constant	-3.654	0.691	-	-5.284	0.000
Performance (X_1)	0.327	0.058	0.285	5.657	0.000
Facilitating conditions (X_2)	0.291	0.056	0.220	5.232	0.000
Functionality (X_3)	0.339	0.069	0.230	4.939	0.000

Information Quality (X_4)	0.211	0.060	0.167	3.504	0.000

Source: Survey data

Note. ** Denotes significant at 1% level

The multiple correlation coefficient of 0.846 measures the degree of association between the Perceived usefulness actual and projected values. When the predicted values are obtained as a linear combination of Performance (X_1), Facilitating conditions (X_2), Functionality (X_3), Information Quality(X_4), the coefficient value of 0.846 suggests that the association between perceived usefulness and the Four independent variables is quite strong and positive.

The R-square coefficient of determination assesses the goodness-of-fit of the estimated Sample Regression Plane (SRP) by measuring how much of the variance in the dependent variables is accounted for by the fitted sample regression equation.

The R square value of 0.715 simply means that the predicted SRP that includes Performance, facilitating conditions, Functionality, Information Quality as independent variables explains around 71.5% of the variation in Perceived usefulness, and the R square value is significant at the 1% level.

The multiple regression equation is

$$Y = -3.654 + 0.327X_1 + 0.291X_2 + 0.339X_3 + 0.211X_4$$

The coefficient for X_1 is 0.327, indicating the isolated impact of SGA performance on Perceived usefulness, keeping all other factors constant. The positive sign suggests that this impact is positive, meaning that for each unit increase in SGA performance, Perceived usefulness is projected to increase by 0.327. This coefficient is highly significant at the 1% level.

The coefficient for X_2 is 0.291, representing the specific impact of facilitating conditions on Perceived usefulness while keeping all other variables unchanged. The positive sign suggests a positive influence, meaning that for each unit increase in facilitating conditions, Perceived usefulness is expected to increase by 0.291. This coefficient is highly significant at the 1% level.

The coefficient for X_3 is 0.339, demonstrating the specific impact of Functionality on Perceived usefulness while keeping all other variables constant. The positive sign suggests a positive effect, implying that for each unit increase in Functionality, Perceived usefulness is anticipated to increase by 0.339. This coefficient is highly significant at the 1% level.

The coefficient associated with X_4 is 0.211, signifying the specific impact of Information Quality on Perceived usefulness while keeping all other variables constant. The positive sign indicates a positive influence, suggesting that for each unit increase in Information Quality, Perceived usefulness is projected to increase by 0.211. This coefficient holds high statistical significance at the 1% level.

Based on standardized coefficient performance (0.285) is the most important factors extract perceived usefulness followed by Functionality (0.230), Facilitating conditions (0.220), Information Quality (0.167). App performance refers to the extent to which utilizing the app will enhance users' travel-related tasks and experiences.(Kourouthanassis et al., 2015). And " The extent to which an individual perceives that using a specific system would improve their job performance. (Lescevica et al., 2013). However, the user believes in SGA performance will enhance user experience and attitude to use SGA. The app's strong performance, in conjunction with the app's reuse intention or the app's technological usefulness, motivates users to download and use the app (Palos et al., 2020).

Multiple Regression Analysis of App Qualities on Attitude to Reuse SGA

Attitude to use SGA is DV in this research, and independent variables are Performance, facilitating conditions, Functionality, Information Quality and analysis, which are discussed below

Dependent variable : Attitude to use SGA (Y)

Independent variables : 1. Performance (X_1)

2. Facilitating conditions (X_2)

3. Functionality (X_3)

4. Information Quality (X_4)

Multiple R Value : 0.887

R square : 0.788

F value : 586.967

P Value : <0.000**

Table 4.7.3 Variables in the Multiple Regression Analysis

Variables	**Unstandardized Co- efficient**	**SE of B**	**Standardized Co- efficient**	**t value**	**P value**
Constant	1.903	0.449	-	4.243	0.000
Performance (X_1)	0.196	0.037	0.228	5.234	0.000
Facilitating conditions (X_2)	0.226	0.036	0.227	6.254	0.000
Functionality (X_3)	0.231	0.044	0.208	5.185	0.000
Information Quality (X_4)	0.269	0.039	0.284	6.894	0.000

Source: Survey data

****Indicate significant at 1% level**

The multiple correlation coefficient of 0.887 measures the degree of association between the attitude to use SGA actual and projected values. When the predicted values are obtained as a linear combination of Performance (X_1), Facilitating conditions (X_2), Functionality (X_3), Information Quality(X_4), the coefficient value of 0.887 suggests that

the association between attitude to use SGA and the Four independent variables is quite strong and positive.

he R-square coefficient of determination assesses how well the estimated Sample Regression Plane (SRP) fits the data by measuring the portion of the variability in the dependent variables that can be accounted for by the fitted sample regression equation.

The R square value of 0.788 simply means that the predicted SRP that includes Performance, facilitating conditions, Functionality, Information Quality as independent variables explains around 78.8% of the variation in attitude to use SGA, and the R square value is significant at the 1% level.

The multiple regression equation is

$$Y = 1.903 + 0.196X_1 + 0.226X_2 + 0.231X_3 + 0.269X_4$$

The coefficient for X_1 is 0.196, illustrating the specific impact of SGA performance on attitude towards using SGA while keeping all other variables constant. The positive sign indicates a positive influence, suggesting that for every unit increase in SGA performance, attitude towards using SGA is projected to increase by 0.196. This coefficient is highly significant at the 1% level.

The coefficient for X_2 is 0.226, indicating the isolated effect of facilitating conditions on attitude towards using SGA, with all other variables held constant. The positive sign suggests a positive impact, meaning that for every unit rise in facilitating conditions, attitude towards using SGA is expected to increase by 0.226. This coefficient is also highly significant at the 1% level.

The coefficient for X_3 is 0.231, representing the specific influence of Functionality on attitude towards using SGA, while other variables remain unchanged. The positive sign indicates a positive effect, implying that for each unit increase in Functionality, attitude towards using SGA is projected to increase by 0.231. This coefficient is highly significant at the 1% level.

The coefficient for X_4 is 0.269, demonstrating the isolated impact of Information Quality on attitude towards using SGA, with all other variables held constant. The positive sign suggests a positive effect, indicating that for every unit increase in

Information Quality, attitude towards using SGA is anticipated to increase by 0.269. This coefficient is also highly significant at the 1% level.

According to standardized coefficient Information Quality (0.284)) is the most important factors extract attitude to use SGA followed by performance (0.228), Facilitating conditions (0.227), Functionality (0.208). Information quality pertains to the extent to which users acquire information from an app that aligns with their needs and meets their expectations (Liu et al., 2020). Quality of information play an main role in travellers' selection (Lai, 2015). Based on the information quality user decide attitude to use technology and reuse it.

Multiple Regression Analysis of Overall App Qualities, PEOU, PU, Attitude to use SGA on Intention to Reuse SGA

The dependent variable in this study is the intention to reuse SGA, and the independent variables are the following are the app qualities, perceived ease of use, perceived usefulness, attitude to use SGA, and analysis described as below:

Dependent variable : Intention to reuse SGA (Y)

Independent Variable : 1. Over all app qualities (X1)
2. Perceived ease of use (X2)
3. Perceived usefulness (X3)
4. Attitude to use SGA (X4)

Multiple R value : 0.838

R square : 0.702

F value : 372.489

P value : <0.000**

Table 4.7.4 Variables in Multiple Regression Analysis

Variables	Unstandardized Co- efficient	SE of B	Standardized Co- efficient	t value	P value
Constant	2.485	0.791	-	3.141	0.002
Over all app qualities (X_1)	0.090	0.013	0.245	6.672	0.000
Perceived ease of use (X_2)	0.066	0.026	0.094	2.573	0.010
Perceived usefulness (X_3)	0.166	0.031	0.236	5.362	0.000
Attitude to use SGA (X_4)	0.317	0.043	0.338	7.368	0.000

Source: Survey data

**** Indicate significant at 1% level**

The multiple correlation coefficient of 0.838 measures the degree of association between the Intention to reuse SGA actual and projected values. When the predicted values are obtained as a linear combination of Overall app qualities (X_1), PEOU (X_2), Perceived usefulness (X_3), Attitude to use SGA (X_4), the coefficient value of 0.838 suggests that the association between Intention to reuse SGA and the independent variables is a robust and favourable approach. The R-square coefficient of determination assesses how well the estimated Sample Regression Plane (SRP) fits the data by measuring the proportion of the variance in the dependent variables that can be accounted for by the fitted sample regression equation.

The R square value of 0.702 simply means that the predicted SRP that includes Over all app qualities, Perceived ease of use, PU, Attitude to use SGA as independent variables explains around 70.2% of the variation in Intention to reuse SGA, and the R square value is significant at the 1% level.

The multiple regression equation is

$$Y = 2.485 + 0.090X_1 + 0.066X_2 + 0.166X_3 + 0.317X_4$$

The coefficient of X_1 is 0.090, which shows the partial effect of SGA Over all app qualities on Intention to reuse SGA while Keeping the other variables consistent. The projected positive sign indicates that such an effect is positive, with Intention to reuse SGA increasing by 0.090 for every unit rise in Overall app qualities, and this coefficient value is significant at the 1% level.

The coefficient of X_2 is 0.066 indicates the partial effect of PEOU on Intention to reuse SGA, Keeping the other variables consistent. The estimated positive sign indicates that such an effect is positive, with Intention to reuse SGA increasing by 0.066 for every unit rise in PEOU, and this coefficient value is significant at the 1% level.

The coefficient of X_3 is 0.166 indicates the partial effect of Perceived usefulness on Intention to reuse SGA, Keeping the other variables consistent. The estimated positive sign indicates that such an effect is positive, with Intention to reuse SGA increasing by 0.166 for every unit rise in PU, and this coefficient value is significant at the 1% level.

The coefficient of X_4 is 0.317 indicates the partial effect of Attitude to use SGA on Intention to reuse SGA, Keeping the other variables consistent. The estimated positive sign indicates that such an effect is positive, with Intention to reuse SGA increasing by 0.317 for every unit rise in Attitude to use SGA, and this coefficient value is significant at the 1% level.

According to standardized coefficient Attitude to use SGA (0.338). is the most important factors extract Intention to reuse SGA followed by Overall app qualities (0.245), Perceived usefulness (0.236), Perceived ease of use (0.094). PU and ease of use influenced AR attitude and intention to use AR and visit a destination (Ko et al., 2019). Perceived usefulness positively influences attitude, which in turn impacts the intention to use (tom Dieck & Jung, 2018b).

4.8 Confirmatory Factor Analysis

The “Confirmatory Factor Analysis” (CFA) is a multivariate statistic used to estimate an instrument's structure by how accurately the measurable variables reflect the various

constructs, to confirm “convergent and discriminant validity”, CFA must be performed to determine whether the research model and measurement items provide a good fit to the data. CFA is applied to each of the factors of SGA quality dimensions of study model and model is distributed in two groups for better result of confirmatory factor analysis, therefore CFA applied separately to independent variable group App qualities (performance, facilitating conditions, Functionality, Information Quality and dependent variable group [PEOU, PU, Attitude, Intention to reuse SGA] to measure whether That is, each construct's items load well on their respective constructs.

Model Fit

The chi-square test statistic (referred to as CMIN in AMOS) is utilized to assess whether the population covariance matrix aligns with the covariance matrix implied by the model. If the test result is not significant, it suggests a well-fitted model. However, if the result is significant ($P < 0.05$), it indicates a poor fit, implying that the model and the data do not align adequately. It's important to note that the chi-square test is sensitive to sample size, often yielding significant results when the sample size is moderate to large.

For a more comprehensive evaluation of model fit, various goodness-of-fit statistics are considered, including the CMIN/DF ratio, Root Mean Square Error of Approximation (RMSEA), Goodness-of-Fit Index (GFI), Comparative Fit Index (CFI), and Normed Fit Index (NFI). Ideally, the 2/df ratio should be as low as possible (2/df less than 3), and RMSEA should be 0.05 or below for a good model fit. Additionally, values for GFI, CFI, and NFI should exceed 0.95. However, a reasonable model fit can still be considered when the 2/df ratio falls between 3 and 5, RMSEA ranges from 0.05 to 0.08, and GFI, CFI, and NFI are between 0.90 and 0.95.

4.8.1 Factor analysis for independent variables

Group one variables

Total Variable in Model: - 44

Observe variables: - 20

Unobserved variables: - 24

Exogenous variables: - 24

Endogenous variables: - 20

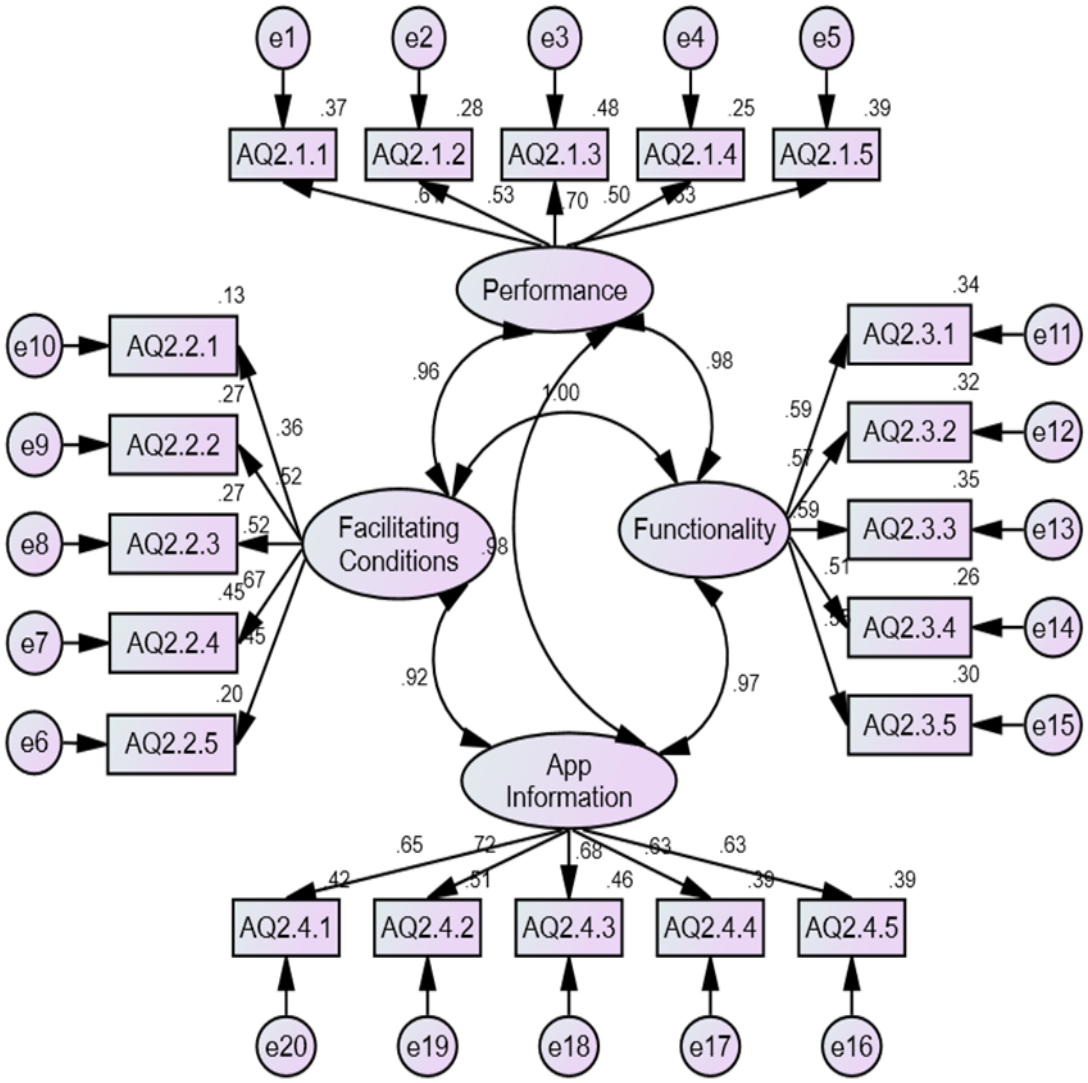


Fig.4.8.1.1 Independent Variable Model Fit Analysis

With reference to table 4.8.1.1 values of measure test indicate that independents variable model good fit with reference to suggested values in table 4.8.1.1 However no further modification is required in the model.

Table 4.8.1.1 Model Fit Summery Independent Variables

Measure	value	Suggested value
Chi Square	560.450	-
CMIN /DF	3.417	Should be as high as 5 (Maat et al., 2015)
GFI	0.974	Values greater than 0.90 (Hooper et al., 2008).
AGFI	0.911	Values greater than 0.90 (Hooper et al., 2008).
CFI	0.974	Values greater than 0.90 (Hooper et al., 2008).
RMR	0.044	Values less than 0.08 (Browne & Cudeck, 1993)
RMSEA	0.057	Values less than 0.08 (Clark & Bowles, 2018).

Source: Survey data

4.8.2 Factor analysis for dependent variables group

"Confirmatory Factor Analysis" (CFA) is applied to each of the factors of SGA quality dimensions of study model and model is distributed in two groups for better result of confirmatory factor analysis, therefore CFA applied to independent variable group App qualities (performance, Facilitating conditions, Functionality, Information Quality) and dependent variable group (PEOU, PU, Attitude, Intention to reuse SGA) to measure whether That is, each construct's items load well on their respective constructs.

The variable used in factor analysis

Group one variables

Total Variable in Model: - 44

Observe variables: - 20

Unobserved variables: - 24

Exogenous variables: - 24

Endogenous variable: - 20

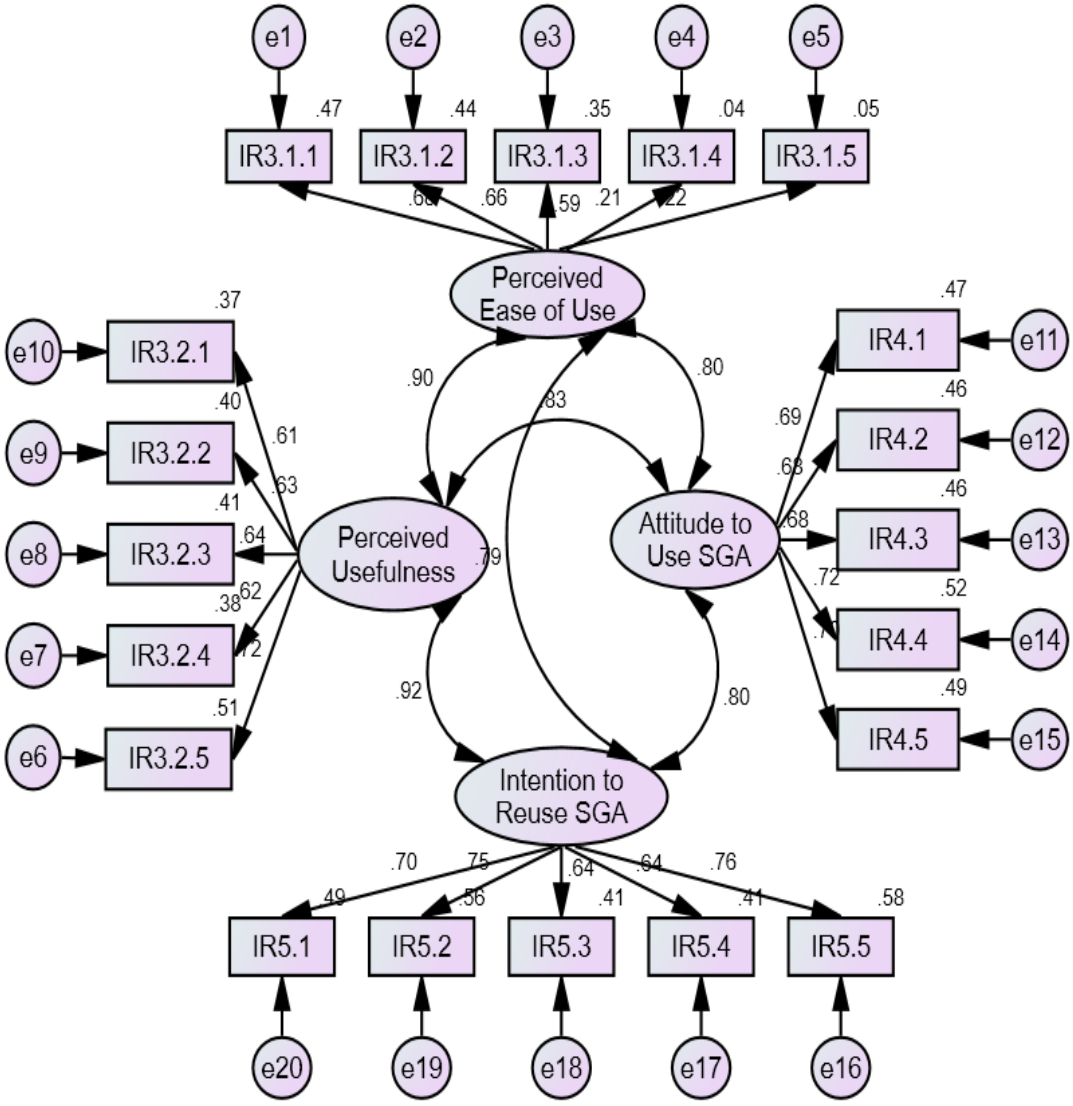


Fig.4.8.2.1 Dependent Variable Model Fit Analysis

With reference to table 4.8.2.1 values of measure test indicate that dependents variable model good fit with reference to suggested values in table 4.8.2.1 However no further modification is required in the model.

Table 4.8.2.1 Model Fit Summery Dependant variables

Measure	value	Suggested value
Chi Square	664.924	
CMIN /DF	4.054	Should be as high as 5(Maat et al., 2015)

GFI	0.932	Values greater than 0.90(Hooper et al., 2008).
AGFI	0.914	Values greater than 0.90(Hooper et al., 2008).
CFI	0.939	Values greater than 0.90(Hooper et al., 2008).
RMR	0.046	Values less than 0.08(Browne & Cudeck, 1993)
RMSEA	0.069	Values less than 0.08 (Clark & Bowles, 2018).

Source: Survey data

4.9 The Structural Equation Model (SEM)

The "Structural Equation Model" (SEM) is a form of statistical models used to explain the relationship between variables. SEM investigates the structure of distinct relationships expressed in a sequence of equations, similar to a series of multiple regression equations. They describe all of the relationships in the analysis between the DV and IV. Because latent factors are represented by multiple variables, these variables are unobserved. When a set of dependent/independent variable relationships is proposed, the "SEM" is the appropriate model to study the relationship. A series of dependence relationships can be investigated using structural equation modelling.

4.9.1 The Variable Used in Structural Equation Model

A) Observed

I. Performance
II. Facilitating Conditions
III. Functionality
IV. App Information
V. PEOU
VI. PU
VII. Attitude to Use SGA
VIII. Intention to Reuse SGA

B) Unobserved

App Qualities

I. e1 Performance

II. e1 Facilitating Conditions
III. e1 Functionality
IV. e1 App Information
V. e1 Perceived Ease of Use
VI. e1 Attitude to Use SGA
VII. e1 PU
VIII. e1 Intention to reuse SGA

Note: e1 error term

C) Variable in Group one

Total Variable in Model: - 17

Observe variables: - 08

Unobserved variables: - 09

Exogenous variables: - 09

Endogenous variable: - 08

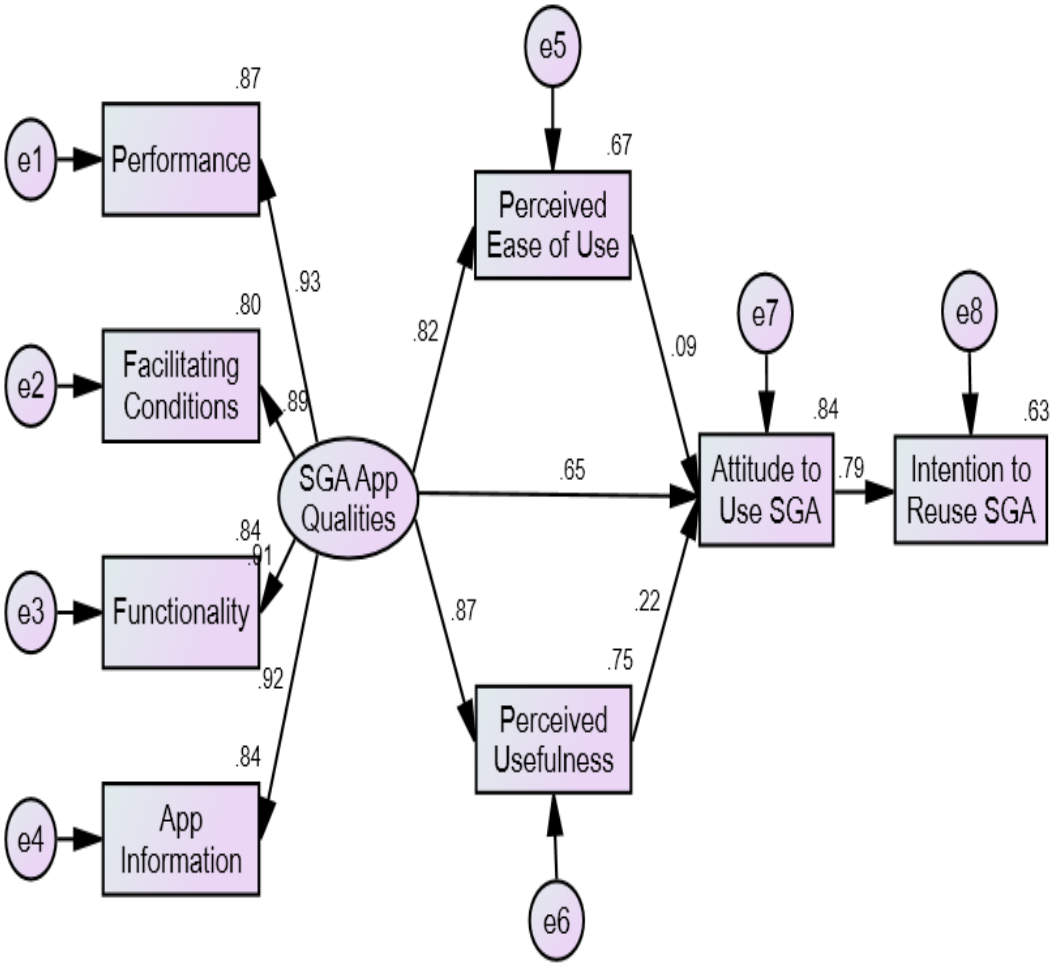


Fig 4.8.1 Research Model

Table 4.9.1.1 Variable in SEM

Variables			U. Coefficient (B)	S.E of B	S. Coefficient (Beta)	t value	P value
Perceived Ease of use	<---	App Qualities	3.531	0.140	0.821	25.158	<0.001**
Perceived Usefulness	<---	App Qualities	3.757	0.137	0.867	27.467	<0.001**
Attitude to use SGA	<---	PEOU	0.066	0.023	0.087	2.825	0.005**
Attitude to use SGA	<---	App Qualities	2.109	0.164	0.649	12.885	<0.001**

Attitude to use SGA	<---	Perceived usefulness	0.164	0.027	0.218	6.012	<0.001**
App Information	<---	App Qualities	3.150	0.104	0.917	30.189	<0.001**
Functionality	<---	App Qualities	2.687	0.089	0.915	30.070	<0.001**
Facilitating Condition	<---	App Qualities	2.934	0.101	0.895	28.953	<0.001**
Performance	<---	App Qualities	3.514	0.113	0.931	31.048	<0.001**
Intention to reuse SGA	<---	Attitude to use SGA	0.745	0.023	0.795	33.062	<0.001**

Source: Survey data

****Indicate significant at 1% level**

The SGA app quality value coefficient is 0.82, and it represents the app quality's partial impact on PEOU while maintaining other variables constant. With every unit improvement in app quality value, PEOU would grow by 0.82 in accordance with the expected positive sign, and this coefficient value would be considered as significant at the 1% level. The SGA quality coefficient value of is 0.87 represents the partial influence of app qualities on PU while maintaining other variables constant. According to the projected positive sign, for every unit increase in app quality value, PU would increase by 0.87, and this coefficient value would be considered significant at the 1% level.

The SGA PEOU coefficient is 0.09 represents the partial influence of PEOU on attitude to use SGA while maintaining other variables constant. According to the anticipated positive sign, attitudes about using SGA would improve by 0.09 for every unit increase in perceived ease of use value, with this coefficient value deemed significant at the 1% level. The SGA app quality coefficient of 0.65 represents the partial influence of app qualities on attitude to use SGA while maintaining other variables constant. According to the anticipated positive sign, attitudes for using SGA would grow by 0.65 for every unit increase in app quality value, with this coefficient value regarded significant at the 1% level. The SGA perceived usefulness coefficient is 0.22 represents the partial influence of PU on attitude to use SGA while maintaining other variables constant.

According to the anticipated positive sign, attitudes towards SGA would grow by 0.22 for every unit increase in perceived usefulness value, with this coefficient value considered significant at the 1% level.

The coefficient of SGA app quality value is 0.92 represent the partial effect of app qualities on app information holding another variable as constant. According to the estimated positive sign, app information would rise by 0.92 for every unit increase in app quality value, and this coefficient value would be considered significant at the 1% level. The coefficient of SGA app quality value is 0.91 represent the partial effect of app qualities on functionality holding another variable as constant. According to the estimated positive sign, functionality would rise by 0.91 for every unit increase in app quality value, and this coefficient value would be considered significant at the 1% level.

The SGA app quality value coefficient of 0.89 represents the partial influence of app qualities on facilitating condition while maintaining another variable constant. According to the projected positive sign, for every unit increase in app quality value, the facilitating condition would grow by 0.89, and this coefficient value would be considered significant at the 1% level. The SGA app quality value coefficient is 0.93 represents the partial influence of app qualities on performance while maintaining another variable constant. According to the projected positive sign, for every unit increase in app quality value, performance would improve by 0.93, and this coefficient value would be considered significant at the 1% level. The value of the attitude to use SGA coefficient is 0.79, which represents the partial influence of attitude to use SGA on Intention to reuse SGA while holding other variables constant. According to the predicted positive sign, intention to reuse SGA increases by 0.79 for every unit increase in attitude to utilise SGA value, and this coefficient value is considered significant at the 1% level.

Model Fit Summary

Table 4.9.1.2 CMIN

Model	NPAR	CMIN	DF	P	CMIN / DF
Default model	20	60.439	18	0.000	3.358
Saturated model	36	0.000	0	-	-
Independence model	8	389.275	28	0.000	13.903

Source: Survey data

Table 4.9.1.3 RMR, GIF

Model	RMR	GFI	AGFI	PGFI
Default model	0.052	0.961	0.947	0.849
Saturated model	0.000	1.000	-	-
Independence model	0.904	0.783	0.651	0.542

Source: Survey data

Table 4.9.1.4 Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI Rho2	CFI
Default model	0.931	0.914	0.953	0.918	0.923
Saturated model	1.000	-	1.000	-	1.000
Independence model	0.000	0.000	0.000	0.000	0.000

Source: Survey data

Table 4.9.1.5 RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	0.065	0.043	0186	0.087
Independence model	0.592	0.580	0605	0.000

Source: Survey data

Table 4.9.1.6 Model Fit Summery Structurer Equations Modelling

Measure	value	Suggested value
Chi Square	60.439	-
CMIN /DF	3.358	Should be as high as 5(Maat et al., 2015)
GFI	0.961	Values greater than 0.90(Hooper et al., 2008).
AGFI	0.947	Values greater than 0.90(Hooper et al., 2008).
CFI	0.923	Values greater than 0.90(Hooper et al., 2008).
RMR	0.052	Values less than 0.08(Browne & Cudeck, 1993)
RMSEA	0.065	Values less than 0.08 (Clark & Bowles, 2018).

Source: Survey data

The measured CMIN/ DF value less than 5 and indicates perfect fit, according to the above table. In this instance, the “GFI” and “Adjusted Goodness of Fit Index” values are both more than 0.9, indicating a good fit. The calculated “Comparative Match Index” value is 0.923, indicating a perfect fit. Additionally, “Root Mean Square Residuals” and “Root Mean Square Error of Approximation” values were determined to be 0.052 and 0.065, respectively, all of which are less than 0.08, indicating a perfect fit.

4.10 Sentiments Analysis

"Sentiment analysis primarily centres around online reviews, a natural focus for researchers in the hospitality and tourism industry who are keen on understanding consumer perspectives. Online reviews are considered more reliable and cost-effective compared to traditional survey data" (Mehraliyev et al., 2022). Sentiment analysis, also known as opinion mining, is the process of extracting people's opinions and using them to understand people's attitudes and reactions expressed on the internet about various issues in the world. Nowadays, with the increased use of the internet, there is a wealth of information available on the web about various products, movies, books, technologies, and so on. On the web, people express their thoughts, opinions, and so on about various products, services, books, and so on. These perspectives can assist the industry or a company in improving their services. If there are negative reviews, the

aspects can be improved; if there are positive reviews, the aspect can be kept in mind when developing a newer version of the service (Shah & Kaushik, 2019).

4.10.1 Sentiment Analysis Result

The results of sentiment analysis are presented below with reference to the research methodology of this study. However, customer is ending user who is use SGA. After using the SGA app, user provide feedback to app providers. According to their experience and the performance of the app during the use they express their positive, negative feeling about SGA, the goal of sentiment analysis is to determine the intention to reuse SGA based on app performance and quality.

Table 4.10.1.1 SGA Detail Statistics

Name of the SGA	**Audio Odigos**	**Digi Tour**	**HopOn India**	**Pinakin**	**Trip My way**
Download by number of users	5000+	5000+	10000+	50000+	10000+
Year since review available	2019	2019	2017	2016	2016
Total reviews available on Google play store as on December 2022	127	88	137	492	233
Number of reviews in written format	40	34	36	227	101
Number of reviews found useful for app users	33	93	225	218	161
Total review available after data cleaning for analysis	73	127	261	445	262
Total review removed after data cleaning	4	5	7	47	9

Over all app rating by users	4.5	4.7	3.2	3.9	4.3

Source: data and google play store

According to the above table 4.10.1.1, the most downloaded app is "Pinakin app," while the lowest downloaded apps are "Audio Odigos" and "Digi tour app." However, it is observed that, launch date is different, reviews for "Pinakin" and "Trip My Way" apps are from 2016 onwards, but reviews for "Audio Odigos" and "Digi tour app" are from 2019. And the highest rating for the "Audio Odigos" app is 4.5 out of five, although the lowest for "HopOn India" is 3.2. Table 4.10.1.2 indicate number of reviews per year for each of the app.

Table 4.10.1.2 Statistic of Annual SGA Users Reviews

Name of the SGA	**Audio Odigos**	**Digi Tour**	**HopOn India**	**Pinakin**	**Trip My Way**
2016	00	00	00	100	72
2017	00	00	11	175	81
2018	00	00	22	85	57
2019	37	02	43	55	35
2020	32	86	185	07	2
2021	04	37	00	20	15
2022	00	02	00	03	00
Total	73	127	261	445	262

Source: Research data

With reference to table 4.10.1.2 “Trip My Way app” has highest reviews 81 in the 2017 and 00 lowest in 2022. “Audio Odigos” has highest reviews 37 in 2019, and lowest 00 in 2022 similarly “Digi Tour app” has 86 in 2020 and 02 in the 2022 “Pinakin app” 175 in 2017 and 03 in 2022, “Hop on India” 185 in 2020 and 00 in 2022. It observes that, after launching of the app most of the users post reviews and year by year it is reduce.

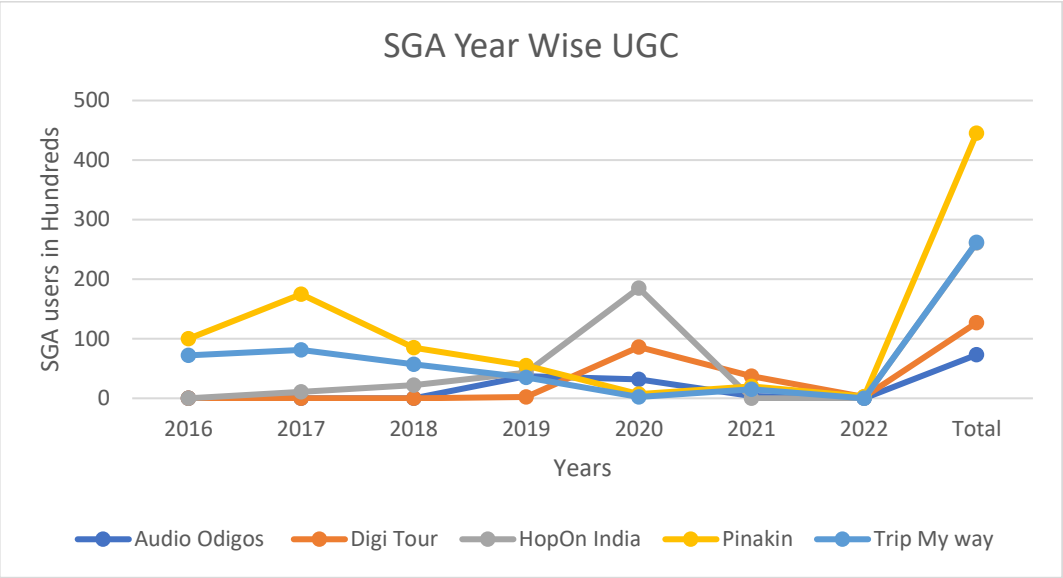


Fig 4.10.1.1Year Wise SGA Users Generated Content (UGC)

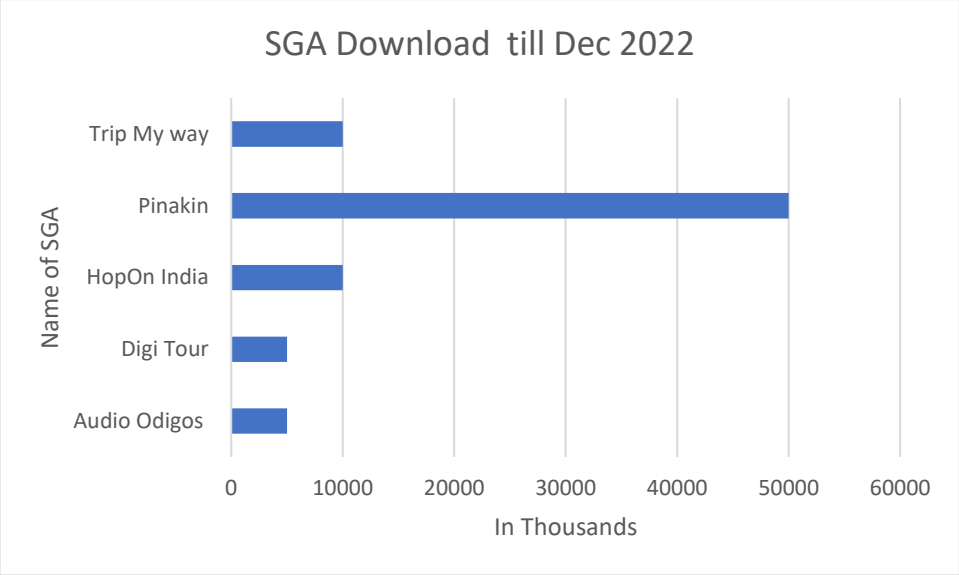


Fig. 4.10.1.2 Bar Diagram App Download Statistics

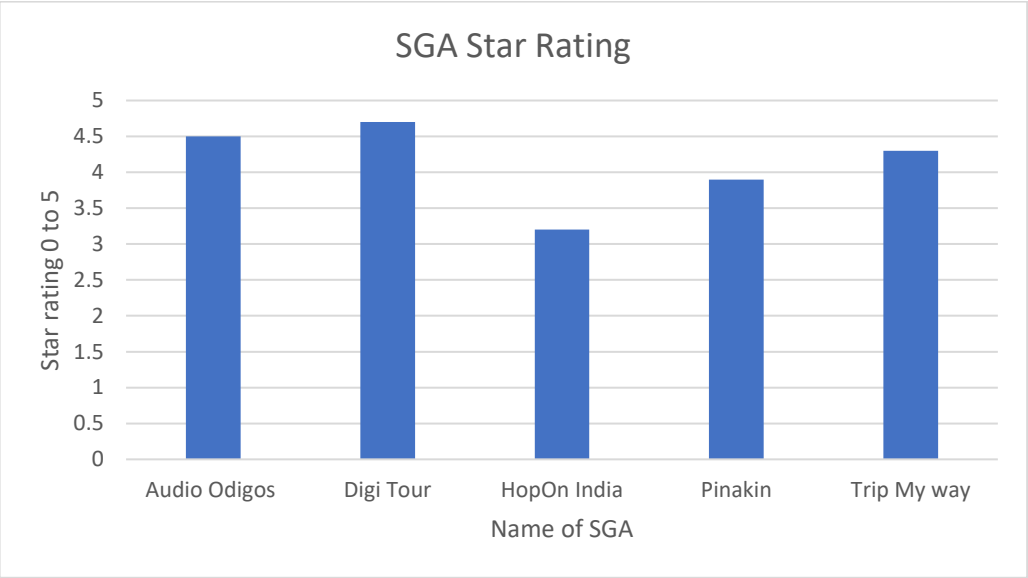


Fig 4.10.1.3 Bar Diagram of SGA Star Rating by Users Source Google Play Store

Result Score of Sentiment Analysis

Many approaches of sentiment analysis rely on classifying a sentence with polarity classes (negative, positive, or neutral). A recent addition to the polarity classification task, however, is the provision of a score connected to the discovered class. This score measures the intensity of a sentence's sentiment. Some authors created procedures with a score range of -1 to 1, while others define the range as 0 to 1. In any case, the greater the score, the stronger the favourable mood in the text. The sentence becomes increasingly negative as the score decreases.(Kiritchenko, 2014). A sentiment score is calculated using several parameters, including the number and type of emotions expressed, the strength of those feelings, and the context in which they are utilised. Sentiment scores can be used to calculate customer satisfaction or to determine whether a text is positive, negative, or neutral in character. However, sentiment analysis performs by Azure Machine Learning (AML) software used with Microsoft Excel following are the result of sentiment analysis. The result shows how generally favourable or negative the text under analysis is. Anything scored below 0.05 is considered negative, whereas anything scored above 0.5 is considered positive. Include everything in between and mark it as neutral.

Table 4.10.1.3 Total Users Generated Content (UGC) used for result analysis are 1168.

Name of the SGA	Sentiment	Number of Reviews	Average score
Audio Odigos	Positive	53	0.798324382
	Negative	08	0.277154329
	Neutral	12	0.555454393
Digi Tour	Positive	106	0.830086312
	Negative	20	0.067704236
	Neutral	01	0.486593697
HopOn India	Positive	196	0.825937643
	Negative	29	0.149488277
	Neutral	36	0.486593693
Pinakin	Positive	347	0.782211936
	Negative	58	0.216153236
	Neutral	40	0.533238987
Trip My way	Positive	170	0.818014149
	Negative	71	0.173618027
	Neutral	21	0.534952379

Source: data from UGC content.

From the table 4.10.1.3 “Pinakin app” has 347 positive sentiments but, average sentiment average score is 0.782211936 and “Audio Odigos” app has only 53 positive sentiment and positive sentiments average score is 0.798324382 which is higher than “Pinakin app.” Furthermore, in positive sentiments the score 0.830086312 “Digi tour app” rank number one and for negative sentiments the score 0.067704236 “Digi tour” is on one number with 20 UGC. However, it indicates that SGA users had good experience at the same time they faced some issues during the use of the app. For neutral sentiment “Audio Odigos” app has 12 UGC and according to the scorer it’s on rank one 0.555454393. Trip my way app has 71 UGC negative sentiments out of 170 and negative sentiments score is 0.173618027. However, there are negative sentiment but not in negative the score. all apps negative scores are in positive number; it indicates UGC are not extremely negative.

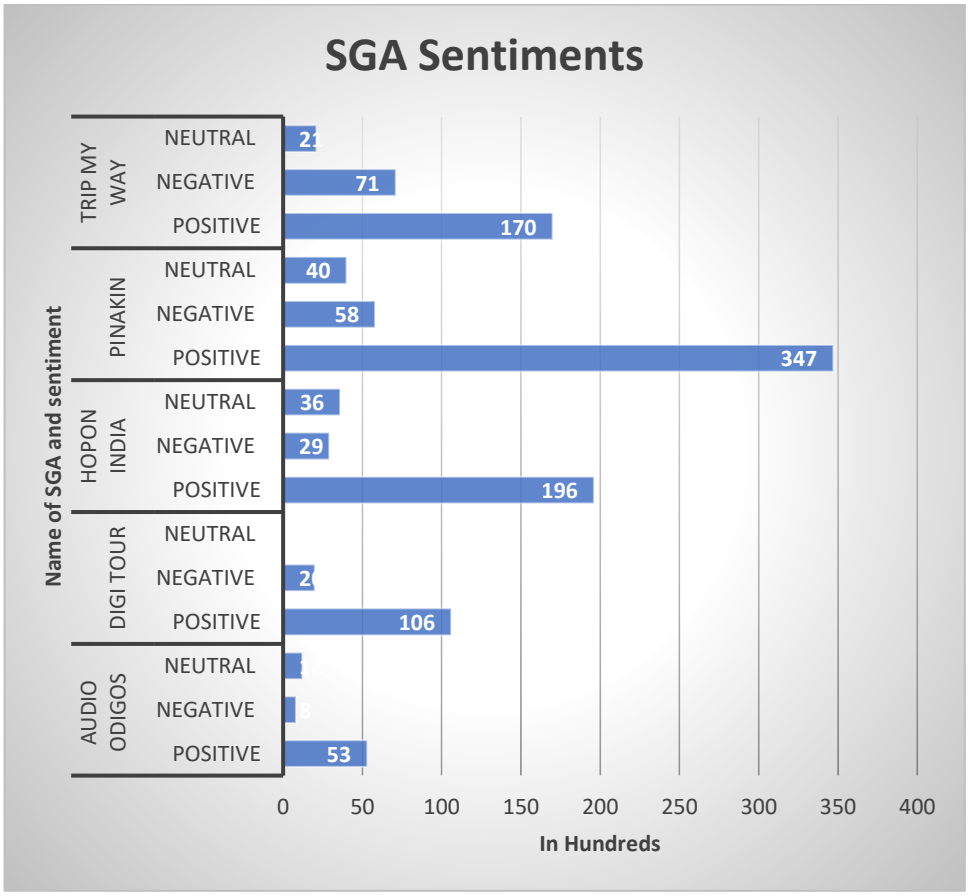


Fig4.10.1.4 Bar Diagram of Classification of UGC Contents

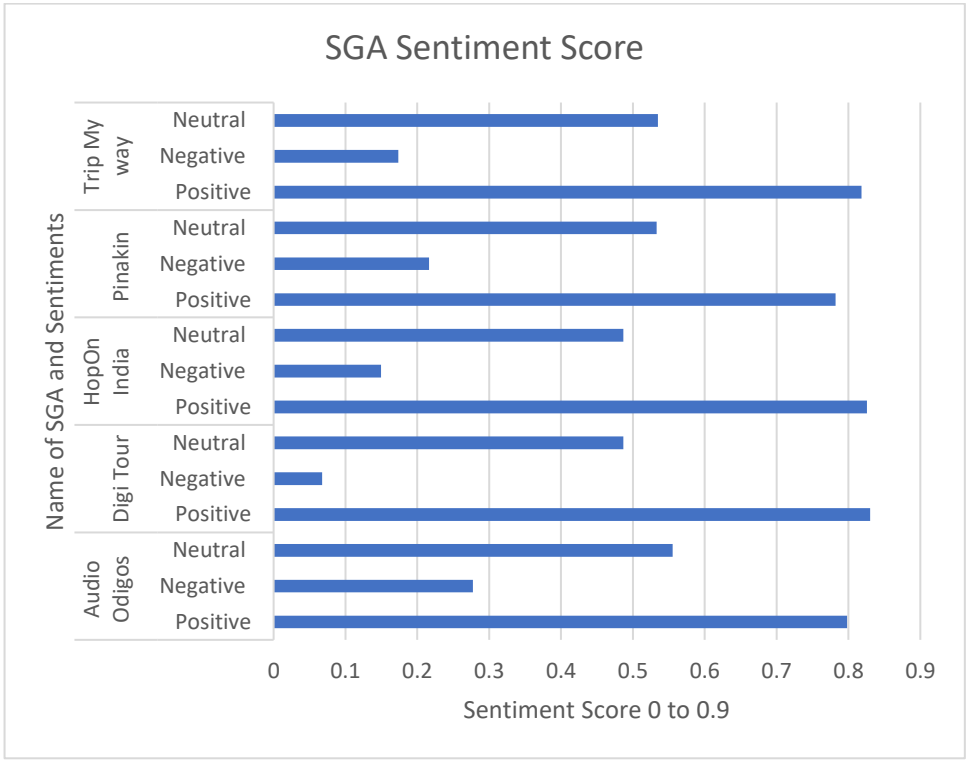


Fig 4.10.1.5 Bar Diagram Comparative Score of Sentiment Analysis.

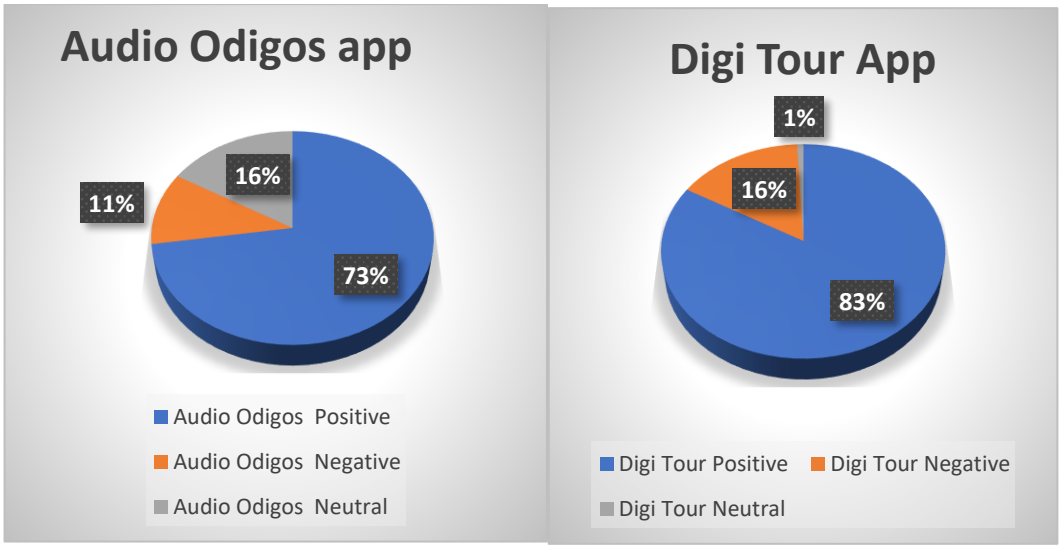


Fig 4.10.1.6 Pie chart of UGC Content in Sentiment Percentage (Audio Odigos, Digi Tour)

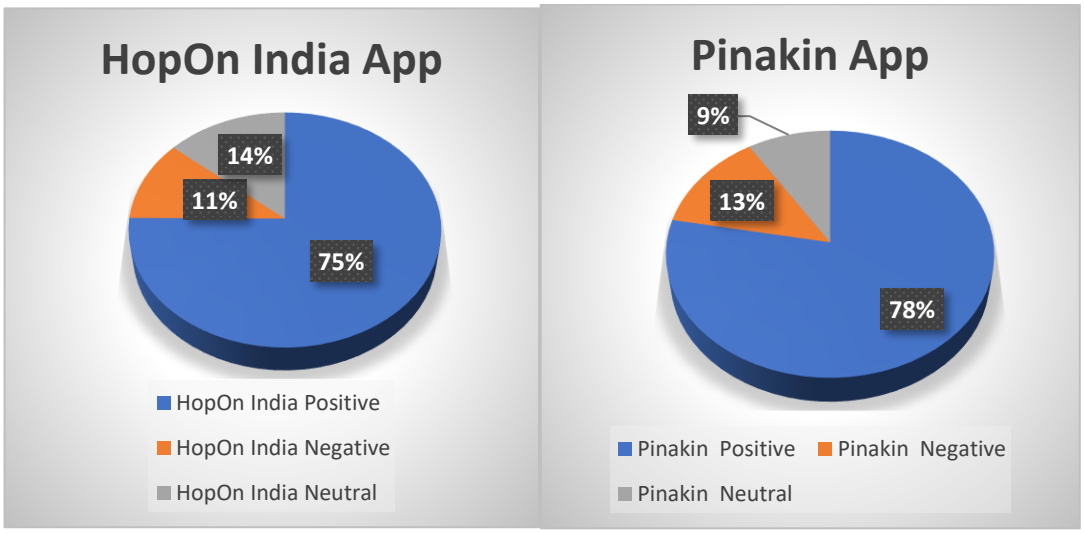


Fig 4.10.1.7 Pie chart of UGC Content in Sentiment Percentage (Hop On India, Pinakin)

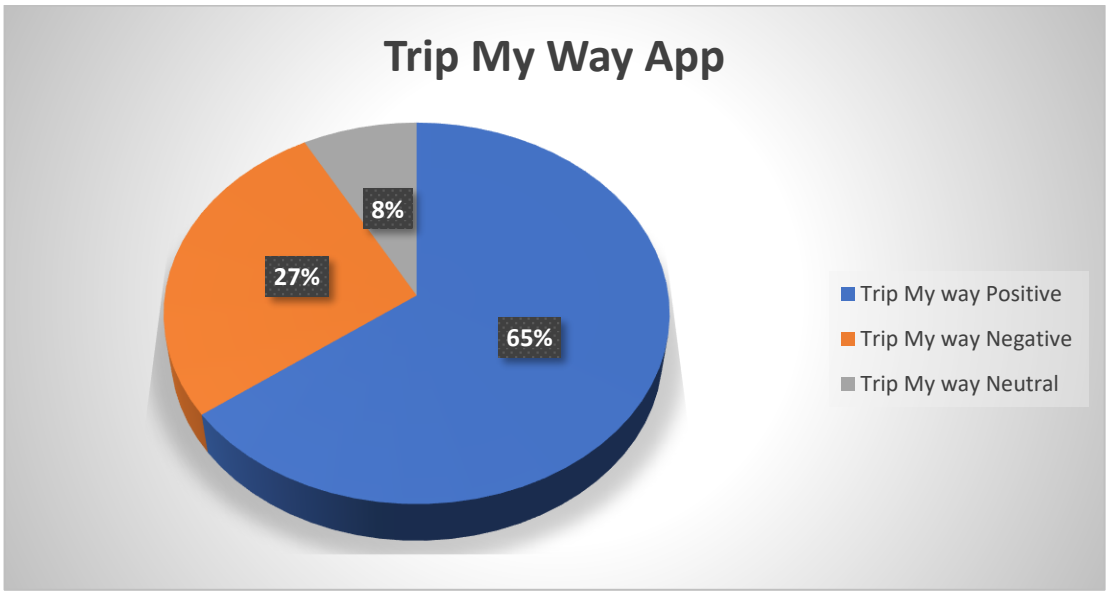


Fig 4.10.1.8 Pie chart of UGC Content in Sentiment Percentage (Trip My Way)

4.11 Content Analysis

"Zhang and Wildemuth highlight that qualitative content analysis serves the dual purpose of generating novel theories and models, as well as substantiating established theories while offering intricate depictions of particular contexts or phenomena. This is accomplished through meticulous data preparation, coding, and interpretation. When operating within an interpretive paradigm, qualitative content analysis emerges as a viable alternative to the more conventional quantitative content analysis." (Zhang & Wildemuth, 2005). According to Law, Full examination of social media's role and effects on the planning of the entire tour, and show that “User Generated Content” (UGC) is more reliable than official tourism “Web sites,” “Travel agencies,” and mass media advertising (Law et al., 2014).

However, collected app reviews data is generated by SGA users. With reference to research methodology systematically code where develop and an inductive research approach used for analysis off 1168 SGA users generated content and from 1168 reviews 438 in written format and remaining 730 like and reacted by the SGA users. And the following is the result of content analysis.

Table 4.11.1 Result of Content Analysis of App User Reviews

Code	SGA Code Description	Frequency
App quality (Performance, Facilitating Conditions, Functionality, App Information)	**Sound** "The sound quality is superb, the sound was pleasant," "Excellent," "Good," "Voice is clear," good voice	21
	App content "Great content," "The content is fantastic," "Excellent, Good," "Very good," "The content was very engaging and informative and extremely well produced," "Content is in depth, Superb," "helpful," "Outstanding content ".	80
	App image "A great view of 360 degree," "Good"	26
	Navigation "Smooth navigation," "Good"	10
	Interactivity "App enough." "Interactive educative," "quite interactive," "Make it more interactive"	15
	Languages "Only English language is there no Hindi language," "need more language's," "include the regional language"	54
Over all SGA	"Nice audio guide," "Best, Informative," "excellent," "good," "Very good ," "Good," "Nice," "Excellent app", "Great audio-visual quality," "Great app," "Very helpful," "love it", "super, useful," "Amazing App," "great app," "very useful," "very good app", "It's a great experience," "App is more than awesome," "A must have app," "Interesting app," "Beautiful app," "Absolutely Amazing," "Nice app,"	568

	"Everyone use this app," "I like it," "Concept is good," "Very creative application," "valuable application," "Like it," " wonderful app"	
PEOU and PU	"It's good and easy to use app," "very user friendly," "Very useful for education and learning," "easy to understandingly recommended for travellers," "app it is useful to guide," "Useful and pleasant app overall." "User friendly app," "Useful "	38
Reuse and recommendations SGA	Recommendation "Loving it and wish it covers every historical place of India as well where people visit and use this tool effectively", "Very useful for travellers, very useful to all," "Everyone use this app," "app too useful for guides," "useful for tourist," "very useful," "useful, really useful," "Very useful app thanks for provided," "Highly recommended," "App is very useful for those who do not want to hire a guide," "easy to understandingly recommended for travellers," "I Would definitely recommend the app," "Strongly recommend this app," "I will be recommending this app to an Italian family going on a temple tour," "would highly recommend to take this app as a guide"	112
Users' issues	"Don't installed," "not happy," "Disappointed," "Totally dead app," "not worthy," "waste app," "Not comprehensive," "can't find much places," "add more languages," "audio not work," "poor app," "bad app," "unusable app", "cant register app," "add more location," "Bugs," "can't change language," "unable to download," "keep	186

	crashing," "need to improve," "waste of time," "verification not done," "Not recommended," "useless for purpose," "Hoping an update," "add tourist site," "add more cities," "Glitches need to be fixed".	

Source: data from UGC content.

4.11.1 App Quality

With reference to literature reviews of this research app quality and sub code were prepared, while preparing sub codes UGC contents are considered for prepared sub code and table 4.11.1 is the outcome of the analysis. App quality is major code and at the time of analysis. What is the performance quality of app, what kind of facilitating conditions, what are the functionality of app, what is the information quality of app. However, app users share their experience in their sentence, language, words they have discuss positive, negative points base on app quality after use app 21 app user's discus about sound quality and they have mentioned the sound quality is superb, excellent, clear, good, pleasant and these word about SGA sound quality are motivate to use SGA to readers of UGC. According to Chakraborty study regarding UGC, the receiver's prior knowledge and experiences influence. In general, consumers in India compare the similarity of online recommendations to their prior knowledge. The greater the similarity, the greater the credibility of online reviews. In India, consumers look for more than just any review. They look for reviews that include justifications for those reviews (Chakraborty, 2019). Furthermore, SGA users written regarding app content quality 80 app users use words like "Great content', "The content is fantastic," "Excellent", "Good," "Very good", "The content was very engaging and informative and extremely well produced", "Content is in depth," "Superb," "Helpful", "Outstanding content" these words indicate how much they are satisfied with the app content. Similarly, app users written about app image, navigation and interactive function of app and 54 app users mentioned about app language and they want SGA with more regional languages.

Out of 1168 UGC 568 SGA user mentioned about overall app quality and they have described their fillings about SGA, words mentioned in table 4.11.1. So, overall SGA quality is fantastic according to UGC.

4.11.3 App Perceived Ease of Use and Usefulness

Second code prepare to know about app perceived ease of use and app usefulness, which are play an important role in technology acceptance. According to the technology acceptance model theory as per mention in table 4.11.1 words like “It's good and easy to use app,” “Very user friendly,” “Very useful for education and learning,” “easy to understandingly,” “Recommended for travellers,” “app it is useful to guide,” “Useful and pleasant app overall.” “User friendly app,” “Useful” are considered for this code and such words use by 38 SGA users.

4.12.3 Reuse and Recommendations SGA

Recommendation by the users that is the unique sales point for the SGA. SGA users recommend SGA by using words like “Loving it and wish it covers every historical place of India as well where people visit and use this tool effectively”, “Very useful for travellers,” “Very useful to all,” “Everyone use this app,” “App too useful for guides,” “Useful for tourist,” “Very useful,” “Really useful,” “Very useful app thanks for provided” “Highly recommended,” “App is very useful for those who do not want to hire a guide,” “Easy to understandingly recommended for travellers,” “I Would definitely recommend the app,” “Strongly recommend this app,” “I will be recommending this app to an Italian family going on a temple tour,” “would highly recommend to take this app as a guide” some of the SGA users recommended SGA to international tourist and some of them mention they will use such SGA in next trip.

4.12.4 SGA Users’ Issues

Out of 1168 UGC only 186 UGC content discuss problem faced by them, while using SGA some of them do not like app, but some of them write solution to app providers such as add more language, add more cities, location in the app. Some of them face technical issues while using SGA such as “function not working properly”, “Unable to download,” “Keep crashing,” “Bugs,” “Glitches need to fix,” so on as mentioned in table 4.11.1 However, such UGC are important for improvement in SGA technology.

Findings from the collected data analysis and UGC analysis are done with similar variable, and as result reuse intentions is positively influenced by app qualities.

4.13 Summary of Chapter

This chapter provides all static information about the respondent as well as a description of the various analyses and tests used. Confirmatory factor analysis, SEM analysis, correlation, and results of all tests are provided in this chapter. The impact of the app quality factor on the study variable in relation to the research purpose. The chapter discusses the results of sentiment analysis and content analysis, as well as key results.

Chapter 5

Conclusion and Suggestions

5.1 Conclusion

In India, smart tour guide app is a new technology, and smart tourism technology improves the tourist experience. This study investigated how perceived ease of use and perceived usefulness influence the attitude to use SGA and tourist intention to reuse SGA. This study's literature review, evaluated various travel app quality dimensions, and it was discovered that there is less research on app information quality and app functionality. Four SGA quality dimensions identified throughout the literature and according to the theory of technology acceptance.1) App performance 2) App functionality 3) App facilitating condition 4) App information quality. To know the usability growth and reuse intention of SGA users in India. Study has been done on Indian SGA, it is found that with reference google play store app information, count of Indian SGA download is subpar as compared with SGA in the world. Few apps throughout the globe found excellent downloads count as comparative Indian apps. It is found that low use of such SGA due to lack of proper implementation and similar found in lee research (S. J. Lee, 2017). However, the study is being conducted in India, the analysis of Indian SGA app quality dimensions is being conducted using app information from the Google play store. In comparison to past research, it has been discovered that a few SGA qualities, such as SGA function, use in online mode or use in offline mode, SGA multi-language, time and money saving of SGA users, and content quality, are required to be study. Additionally, the author analysed these SGA features, using four app quality dimensions and a hypothesis, conceptual model developed in accordance with TAM theory and the UTAUT. Research instruments were developed from the previous travel apps research, for validation of content instrument suggestions from 8 experts in tourism and hospitality added to improvement and pilot study conducted.

The results of a one-way ANOVA of SGA users age groups show that the age groups affect the intention to reuse SGA. Age group above 45 find SGA difficult to use and

required more effort to use. Assistance from SGA is lacking in tour time saving and enhancing experience. However, SGA users age group below 45 find good quality of app in terms of perceived ease of use and perceived usefulness. High influence of gender has been observed on study variables via SGA qualities except perceived ease of use. Furthermore PEOU, placing them at the same level. However study regarding app quality and users experience, gender moderation is seen only with app quality and behaviour intention (Palos et al., 2020).

Relationship between two variables tested based on hypothesis and it was found that SGA app qualities value positively influences on perceived ease of use and attitude to use SGA. Study results constant with Hotel self-service technology adoption (Kaushik et al., 2015). SGA app qualities positively influences by perceived usefulness, towards attitudes to use SGA and intention to use SGA. (Chuang, 2020) argue, that the perceived usefulness and ease of use of technology, influenced the intention to use an AR application and visit a site via AR attitude. However, this research used different variable and application and technology acceptance theory, but consistency in result seen. Strong relation between independent variables of SGA qualities (Performance, facilitating conditions, Functionality, App information) indicate change in independent variable will be effect on another independent variable. Information quality found stronger positive influence on attitude to use SGA among the all variables. Positive impact of overall app qualities seen on intention to reuse SGA. However, qualities of app create positive attitude towards the use and then intention to reuse SGA.

The association between perceived ease of use and the four independent variables is quite strong and positive. Association between perceived usefulness and the four independent variables was found strong and positive. The association between attitude to use SGA and the Four independent variables is quite strong and positive. The association between Intention to reuse SGA and the Four independent variables Over all (App qualities, PEOU, PU, Attitude to use SGA) is quite strong and positive. Changes in the independent variables connect with shifts in the dependent variable, according to the statistical significance. Similarly, a high R-squared value indicates that the regression model explains a large fraction of the variability in the dependant variable.

Facilitating conditions, is the most crucial component determining the influence on perceived ease of use among the 4 SGA qualities. However, research finding matched with Ko et al. Several recent studies on AR technology have also discovered that facilitating conditions are related to users' perceived ease of use. convenient conditions increased perceived ease of use (Ko et al., 2019). Performance, is the most important SGA quality determining positive influence on perceived usefulness among the 4 SGA qualities. Information quality of SGA is the most important factor influence attitude to use SGA among the 4 SGA qualities. Furthermore Lai find information quality play an important role in travellers' decision-making (Lai, 2015). In this research author found information quality play an important role in attitude towards use SGA. Attitude to use SGA is the most important factor influence intention to reuse SGA followed by Overall app qualities, Perceived usefulness, Perceived ease of use.

All the studied hypothesis are accepted at 1% significance in structure equation modelling. It has been found that app quality dimensions have positive impact on perceived ease of use and perceived usefulness, as well as a favourable impact on attitudes towards SGA use. The important finding of this research is positive effect of app qualities on attitude to use SGA, its mean that, good SGA qualities will motivate users to reuse SGA. App information quality is important factor to influence the attitude towards the use SGA, because authentic, sufficient information, about destination motivate to users. The partial influence of perceived ease of use on attitudes towards use SGA is found. Strong positive influence of perceived usefulness on attitude to use SGA is found. However, SGA should be easy to use and interactive. The partial effect of attitude to use SGA on Intention to reuse has been found. However, PU and PEOU has positive impact on attitude towards the use SGA. According to the TAM-based studies, attitude toward technology is one of the key antecedents that influence adoption intentions (Kaushik et al., 2015). Individuals' intentions to continue using mobile and author find apps are directly and meaningfully influenced by their satisfaction and performance expectancy (Tam et al., 2020).

Finding of sentiment analysis shows that “Digi tour” SGA has highest positive sentiments score in amongst five SGA in studies and lowest for negative sentiments. It indicates users find good experience as well as bad experience for the SGA. “Pinakin”

SGA has lowest positive sentiment score among five SGA. Furthermore, “Audio Odigos” SGA found better in terms sentiment score. Online reviews are thought to be more trustworthy and less expensive than traditional survey data (Mehraliyev et al., 2022). However, users’ satisfaction has been observed from the high count of positive sentiment comparative negative sentiment or neutral sentiment.

Bring out the conclusion of positive, negative, neutral sentiment what SGA user are feeling about SGA it is investigated by content analysis. 1168 UGC content are utilized for content analysis and overall SGA quality found excellent, super, very good, nice beautiful, amazing etc by 568 UGC. 38 users generated contents written about perceived ease of use and perceived usefulness which found good. 110 UGC content used few natural exclamation words which indicate user satisfaction, reuse intention and SGA recommendations to domestic and international tourist. However, 186 users mentioned problems face by them during the use of SGA such as glitches registration, crashing etc, few of them given suggestions to SGA provider. Customer reviews are common and powerful influences on travel decisions (Book et al., 2018). In general, consumers in India compare the similarity of online recommendations to their prior knowledge**,** look for more than just any review that include justifications for those reviews (Chakraborty, 2019). Customer’s UGC content play an important role in decisions making before installing app. Content analysis and sentiment analysis are important for improvement in SGA quality and enhance customer satisfaction. If there are negative reviews then aspect and can be improved. And if their positive reviews that aspect can be kept in mind when new version will be developed of SGA. However, app developer needs to work on sound quality, app functionality, app multi-language function, adding more contend and solve technical issues face by users.

5.1 Key Outcome of Study Variables

App qualities are positively associated with perceived ease of use and perceived usefulness and changes in the independent variables connect with shifts in the dependent variable.

App facilitating conditions, is the most crucial component determining the influence on perceived ease of use among the 4 SGA qualities. Because user has Android & iOS

support mobile phones in that case app must be supported to download. Use of SGA in online or offline mode is important for the tourist to use SGA smoothly during the tour. No impact of the lack of network or internet, if tourist has already downloaded video's during the stay at hotel. Offline use of SGA will enhance tour experience of users, AR & VR made it interactive, and app size is important in terms of storage of mobile phone. effortless use, self-support of SGA motivate user to reuse SGA.

App performance, is the most important SGA quality determining positive influence on perceived usefulness among the 4 SGA qualities. App interactivity increases by AR/ VR visualization, app accessibility is important for end users. Using SGA save time in searching and booking of Human tour guide. App consistency while using enhance performance of SGA and provide memorable SGA experience to users.

Information quality of SGA is the most important factor influence attitude to use SGA among the 4 SGA qualities. App audio, video, image, text quality and quantity, with. authentic and relevant information in local, regional, national, international languages enhance information quality of SGA.

Attitude to use SGA is the most important factor influence intention to reuse SGA followed by Overall app qualities, perceived usefulness, perceived ease of use. Because individual holds a positive or negative assessment or judgment attitude to use smart guide app based on app qualities and perceived ease of use and usefulness.

Based on the study variable to know more about users' expectation and app quality sentiment analysis and content analysis done. Key outcome of content analysis is customer's generated content play an important role in decisions making before installing app because user read the contents before installation of app. Content analysis and sentiment analysis are important for SGA developers and providers to do improvement in SGA quality and enhance customer satisfaction.

5.2 Research Implications

This research investigated various app quality dimesons, the literature review will be useful for further research in field tourism and technology. Research model will be useful to examine further research on other apps.

Perceived ease of use and perceive usefulness are important factor which influence on attitude to use SGA and intention to reuse SGA. This finding will assist developing SGA or transformation in new version of SGA.

SGA not only enhance tourist experience during the tour, but also save time and money. When tourist visit any Heritage site, they require tour guide and they spend time on searching of human guide during the season. Apart from finding they need to pay fees for human tour guide. However, quality of SGA like interactive, operability, multilanguage function, easy registration process of SGA, SGA information quality and other technical issues mentioned in content analysis. Improvement in these qualities of SGA, users' attitude to use SGA and intention to reuse SGA will be increased. However, SGA technology provides authentic information about tourist destination. "Audio odigos" is free app which was introduced by ministry of tourism government of India but only for 12 sites, so need to add more sites.

Result of sentiment and content analysis are useful for SGA providers. Statistics of SGA users since launching of SGA will be useful for planning, promotion or launching new SGA. The finding contributes for policy making on SGA implementation for other tourist destination in India.

5.3 Suggestions

The suggestions have practical relevance according to the present study's findings. It is also the researcher's responsibility to propose a solution to the concerns raised in the form of research questions and objectives. Among the suggestions are what should be done and how should it be done to address the problems. Important suggestions have been put forward for app users, app developers, app providers.

5.3.1 Suggestions for App Users.

- SGA users should read app information. So, they can navigate or effectively use SGA.
- SGA user should provide feedback to SGA providers to improve app. Such feedback assistance resolves the issues faced by SGA users during the use.
- SGA is useful to enhance Historical knowledge of tourist destination SGA user can use SGA from any location or while travelling between two destinations.

- SGA can be use by tourism students for study purposes to enhance their knowledge for plan tour itinerary's.

5.3.2 Suggestions for App Developers

- SGA developers should work on perceived ease of use because any age groups users should find easy to use, while operating SGA required lees effort to use.
- SGA developers should work on perceived usefulness of SGA because, SGA should assist user during tour, throughout navigation function, save time of tour duration, enhance tour experience save money spending for Human tour guide fees.
- SGA performance, SGA audio, video, time saving, self-supporting systems need to improve because its influence attitudes towards the use SGA and intention to reuse via perceived ease of use and perceive usefulness.
- SGA developers need to work more on SGA facilitating conditions in terms of offline and online use, online support system, SGA payment option, use on any kind of smartphone etc,
- SGA developer can work more on SGA functionality, interactivity, operability, sound quality.
- SGA developers should do regular analysis of users generated contents. Such content analysis is useful to improve SGA quality.
- SGA developers should work on app qualities like app performance, information quality, facilitating conditions and app functionality in terms of perceived ease of use and perceived usefulness.
- App function during offline use need to improve.

5.3.3 SGA Provider

- High quality of SGA motivates users to use SGA, so providers need to focus on SGA quality improvement.
- SGA users' attitude to use SAG is influenced by trust so need to work to achieve trust of users.
- SGA provider need to work on app information quality like language, content, destination authentic information.

- SGA download statistics in India is less than average as comparative SGA in globe so market research and marketing is required for promotion of SGA.
- There are few SGA in globe available for around 2500 destination and in 54 languages. So, such one stop solution needs to provide to tourist.
- App providers should do usability testing before launching SGA.

5.4 Limitations

- This research was conducted using convenience sampling method, because find out SGA users is difficult and app SGA users' statistics is less. Age below 35 are targeted so SGA reuse intention above age 45 and 60 has not investigated through research.
- This research has investigated about SGA app quality dimension but SGA like "Audio Odigos" is free SGA for users and "Pinakin" SGA is available on Rs 49, and 99 annual subscriptions in January 2023. SGA like "Global Vipassana Pagoda" has only one destination so similarity in destination and app features not consider during the research.
- This research is in Indian context and India SGA were examined only so, SGA on global level is not part of research.

5.5 Scope for Future Research

- Model of this research based on TAM, UTAUT and previous research, so this research will assist readers of thesis for future research.
- Comparative study between two SGA can be done however innovation in technology is going on and new feature, destination, language will be added in the app so continue research required on SGA.
- Use of SGA is very less in India as comparative worldwide so research on app development and marketing of SGA need to do.
- Comparative study between Indian SGA and global SGA needs to do to know about more app quality, feature and international tourist intention to use SGA.
- Comparative study of human guide and SGA can be done in upcoming future.

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Confirmatory Factor Analysis

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Digi Tour App

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https://www.mtdc.co/en/

Ministry of Tourism

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Model Fit AMOS

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Pocket guide app

https://pocketguideapp.com/en/city/travelers

Smart city Missions India

https://smartcities.gov.in/

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Abbreviations

AGFI	Adjusted Goodness of Fit Index
ANOVA	Analysis of Variance
ASI	Archaeological Survey of India
AR	Augmented Reality
CMIN /DF Divided	Minimum Discrepancy Function by Degrees of Freedom
CMA	Content Management System
CFA	Confirmatory Factor Analysis
DV	Dependent Variables
DMRT	Duncan Multiple Range Test
GFI	Goodness of Fit Index
GPRS	General Packet Radio Service
GPS	Global Positioning System
IT	Information Technology
IRCTC	Indian Railway Catering and Tourism Corporation
IV	Independent Variables
ICT	Information and Communication Technology
MAR	Mobile Argument Reality
OTP	One Time Password
PEOU	Perceived Ease of Use
PU	Perceived Usefulness
PDA	Personal Digital Assistant
RMR	Root Mean Square Residual
RMSEA	Root Mean Square Error of Approximation
SGA	Smart Guide App
SEM	Structural Equation Modelling
TAM	Technology Acceptance Model

TRA	The Theory of Reasoned Action (TRA
UTAUT	Unified Theory of Acceptance and Use of Technology
UATAUT2	Unified Theory of Acceptance and Use of Technology (
UCD	User Centred Design
UGC	Users Generated Contents

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Appendices 1

Survey Questionnaire

<table>
<tr><td colspan="2">Profile /Demographic information
Please tick the most appropriate answer</td><td></td></tr>
<tr><td colspan="2">Name:</td><td>Email Id</td></tr>
<tr><td colspan="2">1. Gender
Male
Female</td><td>2 Country of Residence</td></tr>
<tr><td>3 Name of Residential State.</td><td>4. Marital status
1. Married
2. Single</td><td>5. Education
1. Up to HSC
2. Diploma
3. Bachelor’s degree
4. Postgraduate degree
5. PhD</td></tr>
<tr><td>6.Income Monthly
1. 0–14999Rs.
2. 15,000–24,999 Rs.
3. 25,000–34,999 Rs.
4. 35,000–49,999 Rs.
5. 50,000–59,999 Rs.
6. 60,000-1,00000 Rs.
7. 1,00,001 and more Rs</td><td>7. Occupation
1. Student
2. Service
3. Business
4. Homemaker
5. Retired</td><td>8. Age:
15-25 year
26-35 year
36-45 year
45-year and above</td></tr>
<tr><td>9 I Used the Smart guide travel app
1. Never
2. Once in Year
3. Twice in Year
4. Always when I visit tourist site in India.</td><td>10 Number of years since you are using the Smart Tour Guide App (in Years)
1. 0-1
2. 1-2
3. 2-3
4. 3-4
5. 4-5</td><td>11 I have downloaded Smart Guide App and used it before answering questionnaire.
1. If Yes (Please Proceed)
2. No. (No need to proceed further)</td></tr>
<tr><td>12 Name of Smart travel guide App used by you.</td><td></td><td></td></tr>
</table>

1 Strongly disagree 2 Disagree 3 Neutral 4 Agree 5 Strongly agree

(Please Tick Section 1 to 5)

Section 1. Smart Guide App (SGA) Qualities	**Questions**	**1**	**2**	**3**	**4**	**5**
Performance (Barnett et al., 2015 ;, Lu et al., 2015;,Lai, 2013;,Palos et al., 2020)	1. SGA allows me to listen to audio and watch videos smoothly. 2. SGA provides self-supporting tour guidance. 3. SGA saved my time, while I was using it. 4. Using SGA enhance effectiveness of tour. 5. SGA's overall performance while in use is superb.					
Facilitating conditions (Barnett et al., 2015);Ko et al., 2019; Lai, 2013)	6. I can use SGA on my smartphone. 7. SGA is completely free to use and download. 8. SGA Is available for use at a reasonable cost in paid options. 9. I can use SGA in online and offline mode. 10. SGA used by me online support system is available for users.					
Functionality (Jeong & Shin, 2020)Stoyanov et al., 2015)	11. SGA is easily accessible. 12. I can use SGA at any time and from any location. 13. The SAG sound quality was outstanding. 14. I can use SGA as my tour guide 15. I can operate my SGA constantly for all available destinations in SGA.					
Information Quality (Kim et al., 2021; Ali et al., 2021;Palos et al., 2020;	16. SGA provided me information about tourist sites in local, national, and international languages. 17. SGA provides me with enough authentic and relevant information.					

Sánchez-torres & Argila-irurita, 2021)	18. The high quality of the information encourages me to use more of these SGA. 19. SGA provide me information for selected cities only 20. Overall, the app's information quality was excellent.					
Section 2 App quality Perceived Ease of Use (PEOU)	**Questions**					
Perceived Ease of Use (PEOU) (Kaushik et al., 2015;Lu et al., 2015; Ko et al., 2019)	1. I find that using SGA requires less effort. 2. I noticed that I can easily use SGA. 3. I found that I can easily operate SGA. 4. I find SGA is interactive 5. SGA is difficult for me to use.					
Section 3 Perceived Usefulness (PU) (Kaushik et al., 2015;Chuang, 2020;Lu et al., 2015; Ko et al., 2019)	1. SGA assists me in learning more about a tourist attraction. 2. Using SGA, saves my time to search for an authentic human guide. 3. My tour guide fees are reduced when I use SGA. 4. Use of SGA speed up my tour 5. SGA provided me with a fantastic guided tour experience.					
Section 4 Attitude to Use Smart Guide App	Question’s					
Attitude to Use SGA (Kaushik et al., 2015;Ko et al., 2019; Yarimoglu & Gunay, 2020)	1. It's a good idea to use SGA. 2. Using SGA made my trip more memorable. 3. The high quality of SGA encourages me to use it. 4. SGA save my tour guide expenses during tour 5. I will always trust on SGA for use.					

Section 5 Intention to Reuse Smart Guide App	Questions					
Intention to Reuse SGA (Kaushik et al., 2015;Ko et al., 2019;Ko et al., 2019;Sánchez-torres & Argila-irurita, 2021)	1. I intend to use SGA again during my tour in the future. 2. I plan to use SGA to expand my historical knowledge. 3. I will always use SGA to study a tourist destination. 4. I will use SGA to enhance my tour experience 5. I will recommend SGA to my friends and family.					

List of Publication

Title of Research Paper	Indexing of Journal	Name of Journal / Book	Year Of Publication	ISBN NO / DOI
Experience Toward Smart Tour Guide Apps in Travelling: An Analysis of Users' Reviews on Audio Odigos and Trip My Way	IGI Global Book	Planning and Managing the Experience Economy in Tourism	2022	ISBN13 : 9781799887751
Sentiment Analysis of Augmented Reality Smart Tour Guide Apps in India	Scopus	International Journal of Intelligent Systems and Applications in Engineering	2023	https://ijisae.org/index.php /IJISAE/article/view/3518
The Usability Growth of Smart Tourist Guide Application and Quality Dimensions	Scopus	International Journal of Tourism Policy	2023	DOI: 10.1504/IJTP. 2023.10057613
Sentiment Analysis of User Reviews for "Digi Tour" and "Audio Odigos" Smart Tour Guide Applications	Scopus	Ingénierie des Systèmes d'Information	2023	DOI https://doi.org /10.18280/isi.280603
Research Model for Reuse Intention of Smart Tour Guide App (STGA)	Copyright	Government of India	2023	https:// copyright.gov.in /frmStatusGenUser.aspx

List of Conference Attended and Paper Presentation in Last 3 years

Sr no	Name of the Conference	Organize by	Duration	Title of Presented Paper
1	International Conference on Hospitality and Tourism	Jagran Lake City University, Bhopal.	28,29 June 2021.	Comparative Analysis of Smart Guide Apps in India
2	3rd International Conference on Enterprise and Entrepreneurialism in Tourism and Hospitality	Department of Tourism and Hospitality, Jamia Millia Islamia University Delhi and Supported by Ministry of Tourism Government of India.	28 to 23 January, 2022	Systematic Analysis of Smart Guide APP Qualities
3	4th International Conference on "Sustainable Development Goal and Management Practices- SDGMP 2023"	School of Hotel Management and Tourism, Lovely Professional, University, Phagwara, Punjab	3rd and 4th February 2023	Sentiment Analysis of Smart Guide App in India

List of Workshops and Training attended in Last 3 Years for Enhance skills

Sr. No	Academics Training	Institution	Duration	Skill developed
1	Workshop on Best Practices on Research Paper Writing	Quad Editing Service	29 to 21 May 2020	Paper writing
2	Online Short-Term Course National Workshop on Statistical Analysis Using SPSS	HRDC Lovely Professional University, Punjab	22 June to 26 June 2020	Introduction to SPSS
3	Research Development Program on Statistical Method on Data Analysis, SPSS and Free Scopus Publication Process ROMAP-2021	Eudoxia Research center Guwathi, Assam,	7 April to 28 April 2021.	Research Paper writing, Plagiarism and Introduction with SPSS
4	Research Taring	MSME-Technological Development Centre (PPDC) Ministry of Micro, Small & Medium Enterprises, Agra.	from 03.05.2021 to 15.05.2021 (weekdays only)	Basics Research methodology and Research tool
5	International online workshop on Basis Statistical Analysis its Interpretation Using SPSS	Global Institute of Statistical solution, Goa	4 June to 6 June 2021.	How to use SPSS
6	Qualitative Data Analysis Using MAXQDA	Koach Scholar Delhi.	9 July to 8 Aug 2022.	Software use
7	Structural Equations Model using AMOS	Koach Scholar Delhi.	21 Jan to 23 J an.2022	Software use and Methodology
8	Research Methodology	Udemy online portal	1 st march to 3rd March 2022	Research method
9	International Online Workshop on Basis Statistical Analysis its Interpretation Using SPSS	Global Institute of Statistical solution, Goa	2, 3rd and 5th July 2022	How to use SPSS