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Sentiment Analysis of Augmented Reality Smart Tour Guide Apps in India

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Abstract: The invention in technology is underway, register human tour guides are short in supply at cultural heritage destinations during the season. Augment Reality (AR) apps such as smart tour guide apps which are useful for the tourist to enhance tour experience by using AR technology apps. Does the such app fulfil the users need? The purpose of this paper is to do comparative analysis of the "Trip My Way App" and the "Pinakin App" smart guide apps in India and use of smart technology in tourism. This is an exploratory qualitative study conducted by applying comparative research approach. This study compares 18 identified features described by app providers, such as information quality, ease of use, perceived usefulness and so on in app information. The findings of the study will assist app developers to do improvement in the apps. User generated content are useful to resolve technical and other issues face by users. Provider can use machine learning software to do sentiment analysis.

Keywords: *Tourism Technology, Smart Tour Guide App, Augment Reality, App qualities*

1. Introduction:

As a component of smart tourism, AR is being used to offer information about locations and tourism related activities. Based on active utilisation by tourists, its use will enhance visitor satisfaction [1]. Because AR may be used to assist tourists better understand their immediate surroundings, its application in the tourism sector is viable. The main benefit is that visitors can see shaky information on a point of interest that is displayed blatantly in context [2]. The mobile tour guide app is useful for smart tourism destination planning and management [3]. During travel planning, tourist use smart tourism technology such as a smartphone, social media, and travel websites are increasing day after day. The adoption of a smart technology framework improves tourist satisfaction [4]. The role of the destination management company is important for smart tourism research growth, smart tourism experience is dependent on trust in technology [5]. There is no clear definition of smart tourism, and smart tourism is an extension of smart cities, with few studies in this area [6]. Smart tourism destination is define by Lamsfus et al as “A tourist place is said to be smart if it makes extensive use of the smart city's services based of technology in order to personalise and make visitors aware about available services for tourist during the tour. and which are the tourist packages available to them at the tourist place” [7].

During tour planning, tourists required services before departure of the tour, during the tour, and after a tour, and smart technology, provide personalized experiences to tourists [8]. However, in today's digital age, India is embracing smart tourism. According to the Government of India's smart city mission, 100 smart cities were chosen for projects. Referring to information in the Google play store travel applications such as “Mumbai City Guide”, “Trip My Way”, “Hop on India”, “Global Vipssana Pagoda App”, “Mumbai Indicator”, “IRCTC” and “UTS App” of Indian railways, various travel related apps by Google paly store and apps by, local destination management authorities’. Similarly, app by various Hotel’s, travel agents, and tour operators provides a various apps for tourist. Moreover, such apps provide great memorable experience of the tour to those who visit India and use such apps. However future research may focus on the cost and benefits of using applications in remote locations, as well as how they help visitors travel [9].

As published by the press information bureau, the ministry of tourism, government of India, has taken a great initiative by launching a smart guide app “Audio Odigos” for 12 destinations in India. This app will be available in more cities in India very soon. The tourism industry is a seasonal industry, and there is a shortage of Government of India or State Government recognized Human tour guides during the season. In this situation, a smart guide is useful for tourists. However, according to the Google play store, a few thousand tourists are using such a wonderful app. The goal of this study is answering research question what are the various features and quality of free and paid smart guide apps in India and which are similar and different features app has?

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To compare and analyse the smart guide app, 18 features identified from the literatures review, so tourist can choose such apps during their tour. There are both paid and free tourist apps available in India. This is comparative research and finding of research, similar features and comparative different features of "Pinakin App" and "Trip My Way App" that will assist users in choosing app and useful to app providers to do improvement in app. This research is organised as follows: Section 1 Introduction, Section 2 discussed a review of literature on smart tourism and smart guide apps in the world and in India, as well as app features and qualities. Section 3 discusses research methodology and data collection methods, and Section 4 discusses result analysis Section 5 concludes, and Section 6 recommends and directions for future research.

2. Review of Literature

2.1Human Guide and Smart Guide App

The guide is the oldest human activity, and the guide has a different role such as representative role, service provider, facilitator and educator [10]. Communication style, speech, and gestural effect and hand moment all play a significant role in human guide. Speech and way of communication is important for virtual guide to provide memorable experience to tourist [11]. When comparing a human guide to a virtual visual representation of the guide, the focus is on the content, but the connection with the guide is lost [12]. The mobile personalised tourist guide app offers a variety of services to the user in terms of trip planning and sightseeing planning. Tourists can use the location, route, and site information of app at any time anywhere [13]. However, human guides have different roles and responsibilities, where as smart guide apps can be used by tourists at any time, both inside and outside of the destination.

Smartphone travel apps are defined as " Apps designed expressly for travellers, as well as those used in a usual travel environment (e.g. Airbnb, TripAdvisor, and Skyscanner)" [14]. Location-based audio guide developed for Jeju and Seoul in Korea to provide smart tourism services by using app to tourist. Developed tour guide system is useful during an outdoor walking tour that provides location, safe and comfortable route, this mobile tour guide application provides real-time information about tourist attractions in various languages [15]. The audio guide used for storytelling, Gaze guide narrative, is beneficial for tourist activity and provides a panoramic view of a tourist site with a virtual environment. The application obtains the best user experience to users [16].

Continues use of travel app depends on app accuracy, responsiveness, and app reliability apart from the purpose of trip technology efficacy are important [17]. The use of an AR application is determined by the type of facilitating condition the application has, and visual appeal plays a significant influence in the app's goal to be used [1]. App information quality and self-efficacy are important factors in app use; however, in the case of smart guide apps, tourists require authentic information about tourist destinations, which will improve the tourist experience [18]. Users are motivated to continue using apps because they trust and value them [17]. Tour applications are required by tourists in order to plan a tour itinerary, and smart applications allow tourists to customise their tours [19]. Furthermore, when visiting heritage sites, a tour guide is required, and smart guide apps save time spent in searching and booking human tour guides, as well as money spent on tour guide fees. Users' experiences with apps like “Trip My Way” and “Audio Odigos” were superior as comparative human guide; additionally, smart guide apps improve tourist experiences during tours [20].

2.2 Use of Major AR Apps Throughout the World and in India

Concerning the Google play store and the following Fig 1, "Visit Singapore Travel Guide," this application was introduced by the Singapore Tourism Board, and over 5,00000 users have installed it. Another popular application for 3000 cities is “IZI.TRAVEL”, which includes audio travel guides. Furthermore, this application has been downloaded by over 10,00,000 users. The Ministry of Tourism, Government of India, introduced the “Audio Odigos” app, but according to Google Play store data and Fig. 2, only 5000+ users have installed it. Another paid application in India is the “Pinakin App”, which has been downloaded by over 50,000 tourists, and has recently begun to use the smart guide app in India. However, comparative app usage in other countries and India, shows a lower response by tourists, according to Google play store data on app instals by a number of users through November 2022.

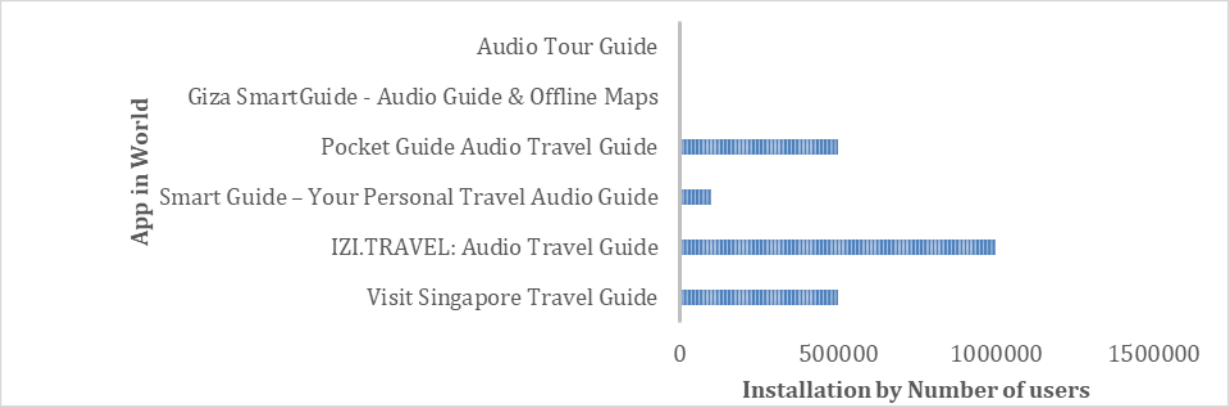

Fig.1 World Tour Guide app uses in World

Source: App information Google play store as on November 2022.

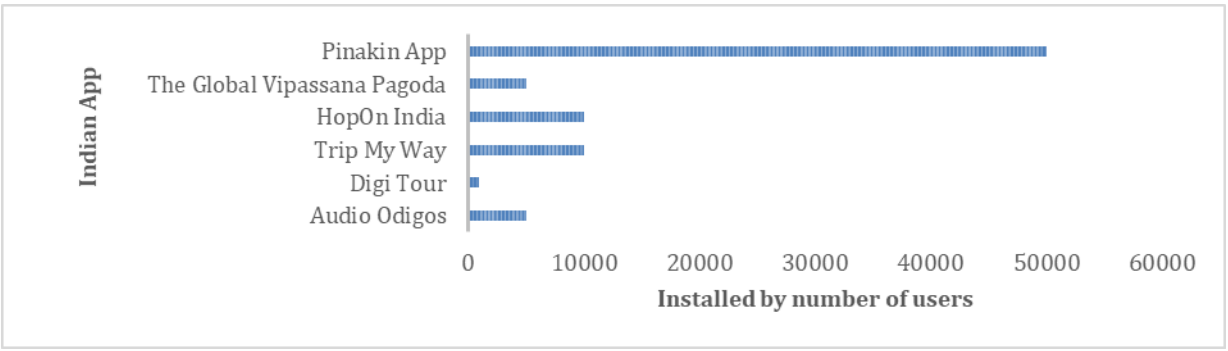

Fig 2. Indian tour guide apps uses in India

Source: App information Google play store as on November 2022.

2.3 Smart Guide App Qualities

The mobile application has seven primary dimensions, 22 secondary dimensions, and 14 service-related designs that are required for the customer to provide all services in a single application [21]. Different studies indicate varying app quality, and they have used various theories to study this app quality, such as app ease of use, information quality, app operability, reliability condition, app interactivity, and app usability. These are major constructs studied to determine tourist intention to use such app based on application quality [22]. However, app developers have provided app features and quality in Google play store app information, and based on user experience, users have given the application a rating ranging from 1 to 5 stars. This rating of app helps tourists choose the correct application to use. Furthermore, the app provider described the app's quality and features, such as multiple cities, the languages in which the app is available, online and online mode of availability, and the use of AR and VR. Furthermore, the app provider described the app's quality and features, such as multiple cities, the languages in which the app is available, use of app in online and offline mode, and the use of AR and VR. Smartphone application 22 usability principles of App studied under user information, user cognitive, user support, user interaction, and user usages these all app principles useful for app developers to identify application usability problems [23]. App service quality, quality of information, and quality of system all have a significant useful impact on user satisfaction with smartphone travel apps, according to the author, and future studies may replicate on the theoretical framework model [24]. According to Google play store, app information plays an important role in app use intent based on features and quality of app used. Apps like “Audio Odigos” are free for tourists, while apps like “Pinakin” are only 49 and 99 Indian rupees with a yearly membership. These payment factors play a significant role in motivating people to use apps.

2.4 Use of technology in tourism

Augmented Reality (AR), Virtual Reality (VR), Augmented Virtuality (AV), and Mixed Reality (MxR) have emerged as prominent immersive reality technologies for the sharing of cultural knowledge in Virtual Heritage (VH). These technologies have been used at museums. To enhance visitors happiness by providing a custom made digital tour guide [25]. Moreover, Hotel enterprises, restaurants, travel companies, museums, and historical places use immersive reality-based technologies

for communicate with customers, booking, tourist services and service providing, marketing of product [26]. AR technology have grown significantly. There has been constant growth in the development of AR applications for heritage sites, resulting in the creation of interesting apps that have a stronger influence on a variety of issues [27]. Tourist guide is an app that employs Augmented Reality technology to let travellers enjoy tourist attractions with a visual treat [28]. Many applications have been developed and are continuously being developed on the basis of augmented reality. Many pilot applications and research initiatives are now being developed. Some of the created apps and studies are being used in the tourism business [29]. Furthermore, use of such technologies in tourism enhances tourist experience at tourist places. App maker's will be able to create more useful tools that will improve the usage of tourism-related services provided by app supplier while also improving visitor happiness with the technological environment. Furthermore, app developers and makers should be aware about acceptance of travel apps differs from usage persistence [30]. Technology like 'ChatGPT' and similar techniques are anticipated to have a significant effect on a variety of tourism procedures. Such technology will help to improve front-of-house customer service while also increasing productivity and efficiency in back-of-house operations. However, there are concerns linked with this technology's employment, such are overdependence on its output, the possibility of replacing human labour with automation, cybersecurity, and a break in personal connection [31].

3. Research Methodology

This is exploratory qualitative research. To answer the research question, what are the various features and quality of free and paid smart guide apps in India and which are similar and different features app has? The comparative research approach used to compare application parameters was established for app selection. According to the criteria, for selection of apps for study from the Google play store, one app is free to use for tourists and has over 10,000+ users installed until November 2022. According to the criteria for selecting apps for study from the Google play store, one app is absolutely free for tourists and has over 10,000+ users installed until November 2022. The second app for study was chosen based on the fact that it has been installed by 10,000+ users and is available at a low cost as a comparative human guide. Other parameters were set based on the features described by app providers and the literature reviews mentioned above. Research methodology a comparative research approach is adopted from [32].

3.1 Data Collection and Selection of Apps

Criteria for app selection from fig. 2 have been established. To conduct a comparative study, the authors installed and used all apps personally to identify app features. Based on app information, one app that is free of charge for users and one app that is the less expensive for tourists as a comparative human guide. Another criterion for selection of apps is, app should be installed by at least 10,000 users. Secondary data has been obtained from the Google play store, where authentic information was provided by the Google play store in the app information. The app information was read four to five times. In addition, information is copied and pasted into a Microsoft Office Word document for data analysis.

3.2 Data Analysis

Parameters were set to compare apps based on a literature review and app information in the Google play store, as following.

1) The App is either free to use or must be purchased. 2) There are tourist destinations in apps for a variety of state tourist sites. 3) The App includes a number of tourist attractions. 4) Number of users installed App. 5) App navigation function is available. 6) What kind of language is used in the app, such as local, national, and international? 7) The app is only available in online mode. 8) Offline mode is enabled for the App. 9) The App includes audio video tours. 10) What is the overall rating of the App-by-App users?11) A large number of user reviews are available to read.12) when the application was updated. 13) How much storage space is required for an app, to be installed on a mobile device? 14) What kind of app version is available? 15) What kind of Android phone is required to use app? 16) What kind of app permission is required to install an app on a mobile device? 17) Is there any loyalty or monetary offer available? 18) Is there any additional tour-related information available?

According to the above parameters, a comparative study of the app was conducted, as shown in Table1.

3.3 Trip My way App

"Ithaka Tales Pvt. Ltd". has created this smart guide app in collaboration with the NTACH, Rajasthan and Delhi Chapters, and the 'DRONAH' foundation. Tourists and users can use this app for free of cost. The application is available for 12 states and 16 cities in India, with 200 attractions. Tourists can use this app both online and offline mode, and a navigation system is available to help them find their way around the attractions. All tours are recorded by local experts, and an interactive map is available to choose a route during the sightseeing tour. Tourists can bookmark their favourite sites and have them at their fingertips; however, this app is currently only

available in English language. Another technical guideline is available in the google play store.

3.4 Pinakin App

This smart guide app is an offer by "Aseuro Technologies Private Limited". To use this app tourist installed the smart guide app from play store on their mobile devices. Users can choose between two membership options: Prime 1 in Indian rupees 49 (Discounted Rate) online unlimited access for one year. Prime 2 in Indian Rupees 99 (Discounted Rate) in November 2022. Unlimited online and offline access to all content in all languages. 20 sightseeing tours are available in Tamil Nadu and Karnataka states. Tourists and users can use this application both offline and online mode.

4. Result and Discussion

Data analysis was performed using reference parameters set for data analysis to compare app one free app in India "Trip My Way" and "Pinakin" which was a paid app identified based on the criteria set, and the following 18 parameters were identified in Table no 1 during data analysis. In table no. 1, compare free and paid apps based on parameters and identify the major and minor differences between them.

Table1. Comparative analysis

Sr. no.	App features technology / Parameter for analysis	Trip My way free of cost App North India	Pinakin App (Paid App South India
1	Paid or Free app	Free	Paid
2	App for Number of states	12	2
3	Number of Sightseeing	200	20
4	Number of People Installs	10,000+	50,000 +
5	Navigation	Yes	Yes
6	Multilanguage	No only English Language English	Yes with 5 Languages, Local, National. International.
7	Offline mode	Yes	Yes
8	Online mode	Yes	Yes
9	Audio/ video Tour	Yes	Yes
10	Star rating by users	4.3	3.9
11	Number of users write reviews	231	484
12	App update as on	13 May 2018	7 April 2021
13	App size in MB	11 MB	9.0 MB
14	App current version	2.8.7	5.3.5
15	Requires Android	4.4 and up	5.0 and up
16	App permission (Identity, Location, contact, Photos / Media / Files, storage, Wi-Fi connection information Other)	Required Identity, Contact Location, Photos / Media / Files, storage, Other	Required Identity, Contact Location, Photos / Media / Files, storage, Wi-Fi connection information, Other
17	Earning Points opportunity	No	Yes
18	Other tour related information	Yes	Yes

Reference: Google play store and Trip My way and Pinakin App information in November 2022.

4.1 Common Features of Trip My Way and Pinakin App

Concerning Table1. There were no differences in five parameters between the two apps. Both apps can be used offline and online, both apps provide other destination information, and both apps have navigation features to help users to navigate. Both apps provide audio video tours for tourists. As a result, users of both apps will find features of the apps that are quite similar to those described by both app providers in the Google play store and on the app providers' websites.

4.2 The Minor Difference Between Trip My Way and Pinakin App

After installing the app on the mobile device, each app required permission; however, a minor difference was discovered during the analysis of the Pinakin app: additional Wi-Fi permission is required for the Pinakin app. Regaining permission Identity of users, contact information of users, location of users, Photos / Media / Files, storage permission from user's mobile, and other app permissions are all seen as quite similar. Concerning the Google play store, both the app and the app provider's website described their features. Minor differences were discovered during the above-mentioned comparative analysis of app permission.

4.3 Major Difference Between Trip My Way and Pinakin App

Out of the 18 parameters, 12 have significant differences that describe app features and which user will use when installing the app. As mentioned in table 2 comparative analysis has been completed, as well as remark and finding statement are written.

Table 2. Difference Between Trip My Way and Pinakin App

Sr. no.	Parameter to compare	Trip my way free of cost app North India	Pinakin App (Paid App South India	Finding statement based on analysis.
1	Paid or free app	Free	Paid	1 “The Trip My Way app is a free app for users. 2 Users must pay to use the “Pinakin app”.
2	App for number of states	12	2	1 “The Trip My Way” app is now available in more states. 2 The “Pinakin app” is only available in a few states.
3	Number of sightseeing places	200	20 (Approximately)	1 More sightseeing is available through the “Trip My Way app”. 2 “Pinakin app” is available for less sightseeing tours (as stated on the app providers' websites).
4	Number of people installs	10,000+	50,000 +	1 Pinakin app installs by more users. 2 Fewer users install the Trip My Way app.
5	Multilanguage	No only English Language English	Yes with 5 Languages, Local, National. International.	1 The “Pinakin App” supports multiple languages. 2 The “Trip My Way app” does not have a multilingual function.
6	Star rating by users	4.3	3.9	1 When compared to the Pinakin app, the “Trip My Way app” has a higher rating. 2 The” Pinakin app” has fewer ratings than the Trip My Way app.

7	Number of users who write reviews	231	484	1 More positive and negative user reviews for the Pinakin app are available. 2 “Trip My Way app” has fewer positive and negative user reviews.
8	App update status	13 May 2018	7 April 2021	1 The “Pinakin app” was updated in November 2022 2 “Trip My Way app” update in May 2018.
9	App size	11 MB	9.0 MB	1 When compared to the “Trip My Way app”, the “Pinakin app” required less mobile storage. 2 “Trip My way app” required more storage as compare with “Pinakin App”.
10	App current version	2.8.7	5.3.5	1 When compared to the “Trip My Way app”, the “Pinakin app” has a higher version. 2 “Trip My way app” has lower as compare with “Pinakin app”.
11	Requires android	4.4 and up	5.0 and up	1 Android 5.0 or higher is required for the “Pinakin app”. 2 Android 4.4 and up is required for the “Pinakin app”.
12	Earning points opportunity	No	Yes	1 The “Pinakin app” allows users to earn points after referring another tourist. 2 There is no way to earn points using the “Trip My Way app.”

Reference: Table 1.

4.4 *Technologic difference between the app*

Bothe the app used different version. However, most used app “Pinkain” was updated in April 2021 and Trip my way was updated in May 2018. Furthermore, app version and app size app update related study need to do in future to know about impact of app technology on users use or installation of tour guide apps.

5. Conclusion

The comparative analysis has been done to compare “Trip My Way App” and “Pinakin App” and it was found that, both smart guide apps, having common and few different features based on 18 identified features. The first finding listed in table 1., five features that are very similar in both apps: navigation, online and offline app use, and audio/video tour availability. The main difference is that the “Trip My Way App” is free for users and to use the “Pinakin app”, users must pay a small fee by purchasing a yearly membership. 12 features, as shown in Table 2. app users can choose whether to use a paid or free app, app has number of destinations in states, Number of sightseeing tours available, Multilanguvage function, star rating by users, number of users write reviews, app update status, app size, app current version, requires android and earning points potential are important finding of study.

The second finding of this study is the number of people who install the “Pinakin App” and the “Trip My Way App”. "Pinakin" is a paid app that has 50,000+ users who have installed it until November 2022, while "Trip My Way App" has only 10,000+ users. When compared to “Trip My Way App”, the “Pinakin App” has significantly lower app in user ratings. “Trip My Way App” found better in terms of tourist destination in number of states, number of tours available and number of sightseeing tours

available as compare with “Pinakin App”. Pinakin application in comparison to “Trip My Way App”, found it to be superior in terms of earning points. Android is required, as is the app's current version, storage/size, the number of people who have installed it, multilingual support, and several user reviews are available for “pinakin app” to choose the app.

Finally, it was discovered from the app installation data that cost of app was not affected on installation by users, but quality of app and feature are important to choose app while downloading form google play store.

6. Recommendation and Limitation

In comparison to the app's features both applications are useful to tourist during the tour. It is recommended to users “Trip My Way App” and “Pinakin App”, both of App have fewer or more features. users can choose the smart guide app based on their tour requirements. App developers can improve 18 features and do content and sentiment analysis of user reviews. Recommendations for future research include comparing similar state apps and using a content analysis method to compare apps.

Limitation of study is only two apps in different states were compared in this study and based on google play store information. According to app selection criteria “Trip My Way App” and “Pinakin App” selected for study, which was based on secondary data from the Google play store and app providers' websites. This study is based on app providers' perspectives, but user expectations from free and paid smart guide apps in India must be compared in future. With different technology apps such as AR, VR, IR, MR.

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