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Sentiment Analysis of User Reviews for "Digi Tour" and "Audio Odigos" Smart Tour Guide Applications

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ABSTRACT

In the context of India's cultural heritage sites, the seasonal influx of tourists often eclipses the availability of registered human tour guides. This imbalance has led to an increased reliance on Smart Tour Guide Applications (STGAs), prompting questions regarding their efficacy in fulfilling user expectations. This study aims to provide a comparative sentiment analysis of user reviews for two prominent STGAs, "Digi Tour" and "Audio Odigos," from 2019 to 2022. Utilizing Azure Machine Learning (AML) for analytical processing, the reviews were systematically examined to gauge user satisfaction and expectations. The analysis revealed that "Digi Tour" achieved an 83 percent positive sentiment score, while "Audio Odigos" garnered a 73 percent positive score, indicating a generally favorable reception among users. Conversely, negative sentiments accounted for 17 percent of reviews for "Digi Tour" and 27 percent for "Audio Odigos," suggesting areas of the apps that may benefit from refinement. These findings provide app developers with actionable insights, underscoring the potential for enhancements that could elevate the user experience within this emerging technological domain.

1. INTRODUCTION

The disparity between the high influx of tourists and the inadequate supply of registered human tour guides in India presents a significant challenge within the tourism sector. Historically, visitors have been dependent on professional tour guides to gain insights into cultural locales, yet the associated costs often render this service prohibitively expensive. The intermittent nature of guide availability, with many serving as part-time professionals and engaging in alternate occupations during off-peak seasons, may lead to inconsistent delivery of information. This inconsistency potentially comprises the retention of critical details pertinent to decision-making, including weather conditions, dates, and historical significance [1].

The "Audio Odigos" app, launched by the Government of India in October 2019, has been posited as a solution to address this gap, offering virtual assistance across 12 tourist destinations. The integration of augmented reality and gamification within these Smart Tour Guide Applications (STGAs) is altering the landscape of mobile tourism applications through enhanced visualization technologies. The utilization of location-based tracking and GPS not only facilitates data collection for providers but also simplifies tour planning for travelers, ultimately contributing to a personalized guest experience [2].

The concept of co-creation in tourist experiences is gaining momentum, necessitating further investment by app providers and developers. Distinctive features are essential for STGAs to differentiate themselves in a competitive market [2]. The role of social media in tour planning, destination selection, and decision-making processes has been underscored by Nezakati et al., highlighting the importance of knowledge sharing about lesser-known tourist sites and the influence of social media applications on tourist decisions [3]. The ability to share content on social media platforms has been found to be instrumental in fostering user engagement and raising product awareness, with future studies proposed to examine the impact of augmented reality content on social media marketing strategies [4].

Sentiment analysis has emerged as a crucial component in the assessment of qualitative and quantitative data, with its applications extending across various sectors, including tourism, hospitality, education, finance, and healthcare. It serves as a pivotal instrument for businesses to gauge customer perceptions post-interaction with products or services, as evidenced by reviews shared on online shopping platforms and social media sites. Consequently, the analysis of such sentiments is instrumental in informing strategic decision-making processes. An anticipation of future demands, there is a necessity for the development of a universal model for sentiment analysis that could be applied to diverse datasets. This model would also benefit from the exploration of additional social networking sites to garner a broader spectrum of user opinions, thereby extending the context of sentiment analysis [5]. The outcomes yielded from sentiment analysis are not only instrumental in shaping business strategies but also provide a foundation for service improvement efforts. User

reviews, reflecting either positive or negative experiences, require efficient analytical approaches to distill actionable insights. Nevertheless, the potential for the dissemination of false reviews, whether deliberate or accidental, poses a challenge that necessitates careful scrutiny [6].

Traditional research methodologies, such as content analysis, are often encumbered by their labor-intensive nature, especially when applied to larger datasets. In contrast, sentiment analysis offers a more scalable solution, albeit with the recognition that it is more suited to extensive data, while content analysis retains value for smaller datasets. hang et al. [7] delineate sentiment analysis into three distinct categories: aspect-based, sentence-level, and document-level. Aspect-based sentiment analysis scrutinizes texts relative to specific aspects, determining the sentiments associated therewith. Sentence-level analysis, on the other hand, concentrates on the sentiment conveyed within individual sentences. Document-level analysis examines the aggregate sentiment of a text document, classifying it as positive, negative, or neutral.

The significance of user opinions is paramount, as they substantially influence the public perception of products and services [8]. Therefore, a comparative review of user sentiments is a critical area of research [9].

The present study aims to interrogate the research question, "Do Smart Tour Guide applications meet tourist expectations?" by conducting a comparative analysis of two such applications, "Audio Odigos" and "Digi Tour." The selection of these applications was conducted in accordance with predetermined criteria for this investigation. The sentiment expressed in user reviews of these applications was systematically analyzed to compare levels of user satisfaction. The findings of this analysis are set to inform the study's conclusions regarding the efficacy of Smart Tour Guide applications in fulfilling tourist expectations.

2. LITERATURE REVIEW

2.1 The influence of app reviews on service providers

In the preliminary stages of trip planning, potential travelers frequently consult online reviews across various platforms, including social media. Such reviews significantly inform their decisions regarding tour destinations and products [10]. The ubiquity and influence of electronic word-of-mouth are particularly pronounced within consumer sectors. Both consumers and providers of products and services are confronted with the challenge of navigating vast and evolving landscapes of information. The guidance necessary to traverse these landscapes is often found in the aggregated sentiment-positive, negative, or neutral-of reviews, blogs, and social media posts [11].

The criticality of discerning underlying issues in customer feedback is paramount for sectors like the hospitality industry. Hotels, in collaboration with online review platforms, have been known to employ automated text-mining methods to construct review analysis frameworks. These frameworks aim to elucidate customer grievances, thereby enhancing service quality, customer satisfaction, and, ultimately, revenue [12].

Research into consumer sentiment possesses significant utility across various sectors, including hospitality, tourism, finance, healthcare, and education. The abundance of reviews available in these sectors, coupled with the time and cost efficiencies of sentiment analysis, underscores its value. Consumers often engage in an online vetting process, reading readily available reviews before making a purchase. Post-purchase, consumers tend to express their experiences through online reviews. The importance of understanding the motivations behind such consumer reviews is evident. Manual evaluation of these reviews presents a formidable challenge due to their voluminous and subjective nature [13]. However, advancements in technology, particularly machine learning, offer potential solutions for the analysis of these vast quantities of review data.

2.2 App review's role in decision making

In the contemporary digital era, Electronic Word of Mouth (eWOM) has become a pivotal factor influencing consumer behavior. Given the plethora of online information sources, individuals may experience confusion when attempting to make informed decisions. Nonetheless, the influence exerted by eWOM on decision-making processes is contingent upon the consumers' capacity to assimilate and interpret information from diverse sources. The evaluation involves not only understanding the technical aspects of products or services but also comparing them against alternative options [14]. Reviews are often predicated on the knowledge and experiences of the reviewers, with Indian consumers, in particular, seeking out reviews that not only compare products or services but also provide justification for the comparisons. It has been observed that greater similarity in reviews correlates with increased creativity in the content of online reviews [15].

The advent of digital technology and social media has been identified as having a profound impact on the tourism and hospitality industry. Online platforms such as "TripAdvisor" have emerged as significant repositories of consumer reviews. These reviews, along with social media sites, play a critical role by providing complimentary information to travelers and are considered integral to the decision-making processes of prospective customers [16]. The influence of consumer reviews on travel-related decision-making is well-established, yet the mechanisms through which social influence is exerted in the modern online purchasing environment remain to be fully elucidated. Historically, the domain of social influence has been essential to the progression of research in consumer behavior and hospitality/tourism studies. Given that online reviews often encompass a multitude of informational and normative signals, the relevance of normative and informational social influences cannot be understated. It is important to note, however, that these principles were formulated under circumstances markedly different from those of the current purchasing environment [17].

2.3 Sentiment analysis and related research

Sentiment analysis has been increasingly recognized for its utility in the hospitality and tourism industries, as evidenced by the proactive measures taken by many hotels and restaurants to leverage platforms such as "TripAdvisor." These establishments encourage consumers to share positive experiences, although there is an inherent risk of negative feedback. The management of both positive and negative reviews is deemed crucial, as these can significantly influence potential consumers. Moreover, tourism managers are broadening their analytical scope to include commentary from general social media sites like Facebook and Twitter, where customers frequently post their experiences. These narratives

contribute to the formation of individual decisions regarding hotels and restaurants. Further research is warranted to explore the nuances of customer feedback, with an emphasis on accessibility and the subsequent analysis of such feedback, which is integral to the enhancement of tourism businesses [18]. Sentiment analysis within the field of hospitality and tourism is instrumental in deciphering consumer sentiments, a task that is central to the overarching aim of sentiment analysis: to comprehend consumer opinions pertaining to travel-related services. Online reviews have been acknowledged as a trustworthy and cost-effective alternative to traditional survey methods for data collection. They serve as a pivotal source of information for tourism businesses and necessitate a critical evaluation to ascertain their influence [19]. Hou et al. [20] underscored the feasibility of analyzing a large corpus of reviews from diverse online sources in a time-efficient manner through sentiment analysis. This methodology facilitates the extraction of targeted words to suit specific research needs.

Sentiment analysis, or opinion mining, involves the computational identification and categorization of opinions expressed in text, particularly to determine a writer's attitude towards a particular topic or the overall contextual polarity of a document. With the proliferation of internet usage, vast amounts of opinionated data have become available, spanning a range of subjects including products, movies, books, and technologies. Such data, reflecting public sentiment, can significantly inform industry practices. Negative reviews can pinpoint areas for improvement, while positive feedback can guide the development of new iterations of a service or product [21].

2.4 Expectations of app users

The ubiquity of mobile applications among smartphone users has given rise to a technological paradigm wherein the determinants of continuous user engagement have yet to be fully elucidated. It has been identified that the continuance of mobile app usage is significantly influenced by the users' performance expectancy and satisfaction [22]. Despite the extensive adoption of mobile technologies, research into the persistence of user engagement across various technological platforms remains limited.

The investigation into smart tourism destinations has largely been confined to the characterization of smart tourism technologies rather than their impact on visitor experiences. The integration of smart technologies holds the potential to enhance visitor engagement at tourism sites; however, empirical studies exploring the influence of such technologies on overall tourist satisfaction and consequent behaviors are scarce. There is a growing recognition that the interaction of travelers with smart tourism technologies may have a profound impact on their satisfaction with the destination and their propensity to return [23].

Augmented reality (AR) has emerged as a significant technological advancement within the realm of smart tourism, offering detailed information and enriching the tourist experience at sites of interest. Despite its potential, the adoption of AR has been gradual, with tourists facing challenges in adapting to the rapid pace of technological innovation. Research indicates that perceived ease of use and perceived usefulness exert a considerable influence on both the intention to use AR and the intention to visit heritage sites, mediated by attitudes towards the technology and its perceived utility [24].

The use of mobile devices and applications by tourists during their travels is shaped by a constellation of factors, including both extrinsic and intrinsic motivations, situational facilitators, prior experience with smartphones in a travel context, cognitive beliefs, habitual smartphone usage, and availability of WiFi. These elements collectively contribute to enhanced travel experiences through expedited transactions, improved communication, reliable service, and greater connectivity. Augmented reality and gamification are introducing a novel dimension to virtual experiences, which in turn bolsters the attractiveness of destinations and demands a re-envisioning of mobile tourism applications with a focus on visualization and personalization of the guest experience. In the advancement of mobile technologies for tourism, the co-creation of experiences between service providers and application developers is becoming increasingly pivotal, necessitating further investment in this collaborative approach [2]. Ali et al. [25] suggest that for mobile application developers seeking to foster user engagement, it is imperative to delineate the quality of their applications into three distinct categories: information quality, system quality, and service quality. Among these, service quality has been posited as the strongest predictor of user engagement. This underscores the importance of emphasizing customer service within travel-related applications, advocating for the integration of in-app customer support and real-time interaction capabilities to facilitate increased user engagement. Service providers, therefore, should focus on delivering current, accurate, dependable, and relevant information through smartphone applications as a primary objective.

3. RESEARCH QUESTION

When comparing tourist arrivals in India, a low supply of registered human tour guides was discovered during the season. However, there are free and paid apps available for tourists in the Google Play store to address this issue. This study compares free and paid app features and determines whether this app meets the users' expectations based on the above literature review. This study was carried out in order to answer the following research question like, Does the Smart Tour Guide app fulfill the app user’s expectation? And comparative study of smart guide apps.

4. METHODOLOGY

This is exploratory research and qualitative research approach used to answer research question. Does the Indian Smart Tour Guide app meet the users’ expectations. According to the research objective, to conduct a comparative study of Smart Tour Guide app user reviews, sentiment analysis was used. Sentiment analysis is a significant component of the research that many researchers conduct in this area. Similar to this, application reviews typically include both positive and negative user sentiment [26]. The approach to discover user opinions is called sentiment analysis. The user review is classified as good, negative, or neutral based on sentiment analysis. It demonstrates to the stakeholders which features received favorable feedback and are well-liked by users, and which features received unfavorable feedback and are unsatisfactory to users. If a review is neither favorable nor negative, it may be considered neutral because the person may

have only expressed his or her knowledge or experience. Unsupervised sentiment analysis approaches are necessary for sentiment analysis on user review data [27].

4.1 App selection

The following app selection criteria have been established to avoid bias in the selection of apps for comparative study Table 1.

Table 1. App selection

Set Criteria	Audio Odigos App	Digi Tour App
Free or paid	Free	Paid
Reviews available since year	2019	2019
Destination	More than two	More than two
App download till January 2023	5000+	5000+
Star rating out of 5	4.5	4.7

Source: Google play store

(1) Smart guide app must be free to use and can be download from Google Play store, while another Smart guide app must be purchased to compare both the app users' reviews.

(2) Second criterial is similarity of study period. Because the study period should be the same, user reviews for both apps must be available from the year 2019 onwards.

(3) Selected apps must have more than two destinations to examine the app quality.

(4) To prevent bias in data collection, the number of users downloading the app must equal the number of users in January 2023. According to Palos et al., the performance of the app smart guide app is related to the user's expectations during the tour. The app's strong performance, or the app's technological usefulness, motivates users to download and use the app [28].

(5) The overall app rating needs to be 4 or more out of 5.

As the app store claims that ratings may encourage users to download apps. Thus, these standards were created to ensure that the two research apps are of comparable quality.

According to above set app selection criteria "Audio Odigos", "Digi Tour", "HopOn India", "Pinakin", "Trip My way", "Global Vipassana Pagoda" apps found in Google play store. However, "Audio Odigos", "Digi Tour" apps are selected for further research because these two app meet with app selection criteria of this research. Moreover, hop on India", "Pinakin", "Trip My way", "Global Vipassana Pagoda" apps not meet with to set app selection criteria, so these app were not selected for this study.

4.2 Data collection

"Audio Odigos", "Digi Tour" both app user review easily available on open source google play store platform. 73 app users' reviews copied for "Audio Odigos app" and 88 app users reviews copied for "Digi Tour app" and pasted in to the Microsoft word document and Microsoft excel for further process.

4.3 Data cleaning

Data cleaning is important task of collected data to increase accuracy in the outcome of result. Microsoft word document features like spell check is useful for such cleaning of data. However, Sentiment analysis save time and money during the analysis because manual reading of review it will take more time. Similar cleaning process applied by Masrury and Alamsyah [26].

(1) Removing repetitive letters

Some of the review repetition of words / letter has been observed and for the to increase accuracy in result removal of repetitive letter has been done.

(2) Spelling Check

Spell check is an important to understand a correct meaning of sentence while sentiment analysis in a Microsoft Word document is accomplished through manual reading and the spell-checking feature of MS Word.

(3) Tokenization: is process of braking whole sentence in to the small phrases which is known as token.

(4) Language translation: some of the reviews written in local language such as Hindi so by using google translator sentence or words converted in to the English language.

According to Table 2 The "Audio Odigos app," found only 73 app user reviews, which are considered for further analysis. However, the total count of 127 reviews includes the app developer's response, so after removing such response, the final count is 73 for "Audio Odigos app,". Furthermore 127 reviews for "Digi Tour app" However, 34 reviews are in written format, and 93 users prefer to read reviews written by others, so the total number of reviews for the "Digi Tour app" is 127 which are consider for further sentiment analysis.

Table 2. Data cleaning statical information

Name of the App	Audio Odigos	Digi Tour
Number of Reviews used for data cleaning	73	127
Number of reviews in written format	40	34
Number of reviews found useful to app users and like by them	33	93
Total valid review available after data cleaning for analysis	73	127

Source: Research data

4.4 Data analysis

Sentiment analysis perform by using Azure Machine Learning (AML) software used with Microsoft Excel Natural Language Processing (NLP). The software is used because it is user-friendly, doesn't require any prior knowledge of machine learning, and has a free trial version available. However, AML software work as extension in to the Microsoft Excel sheet so analysis performed in to the NLP. The utility of sentiment analysis is to gain a better understanding of customer opinions. Understand common topics and trends by identifying key phrases and entities such as people, places, and organizations. Text in a variety of languages is evaluated by this software. However, to ensure data validity and reliability during the collection of data and during the analysis manual reding of review's done to confirm positive, negative or neutral sentiment of app users.

5. RESULTS AND DISCUSSIONS

5.1 Comparative analysis of reviews

With the reference to the Table 1 "Audio Odigos" and "Digi Tour app" compare both the app download by 5000+ users

both app reviews are available 2019 onwards. However total number of reviews are 73 for Audio “Odigos app” 127 for “Digi Tour app” and highest reviews recorded for “Audio Odigos” are 37 in 2019. However, “Digi Tour app” 86 in year 2020. Moreover, in year 2022 recorded lowest reviews it was indicate poor use of app or users are not interested to write positive or negative reviews. However, Table 3 and Figure 1 shows the annually reviews written by users from 2019 to 2022.

Table 3. Comparative annually reviews written by app users

Year	Audio Odigos	Digi Tour
2019	37	2
2020	32	86
2021	4	37
2022	0	2
Total	73	127

Source: Research data

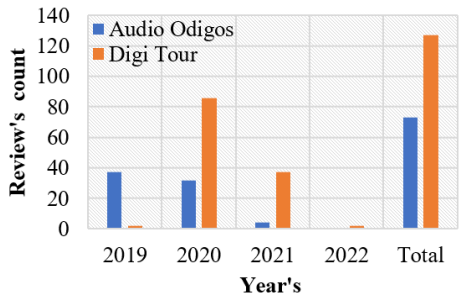

Figure 1. Bar diagram annually review’s written on Google play store

5.2 Sentiment analysis

Several factors are considered when calculating a sentiment score, including the number and type of emotions expressed, the strength of those emotions, and the context in which they are used. Sentiment scores can be useful for calculating customer satisfaction or determining whether a text is positive or negative in nature or neutral. However, sentiment analysis performs by Azure Machine Learning (AML) software used with Microsoft Excel. The result of sentiment analysis shows how generally favorable or negative the text under analysis. 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. Moreover, the comparative study of individual review indicates that, heights positive sentiment score noted for users of “Digi Tour app” is 0.966951668 its indicate that how users satisfied with app. The "Audio Odigos app" has only one user has given heights positive sentiment score for is 0.980875313, which indicates extremely satisfied.

Table 4 and Figure 2 show that 106 users' average score for positive sentiment is 83%. 16% of reviews are negative, and only 1% are neutral. This means that 83% of reviews written by "Digi Tour app" users were positive, indicating that most of the users are satisfied with the app's service.

Table 5 and Figure 3 show that the average score of favorable reviews from 53 users is 73%, while only 11% are negative and 16% are neutral. This means that 73% of reviews written by the "Audio Odigos app" users are positive, indicating that users are satisfied with the service's performance. However, the 11% unfavorable reviews show that the app still needs to be improved. 16% of reviews are neither favorable nor negative because the users are not satisfied with the app's services and want to recommend improvements.

After sentiment analysis comparative analysis results of the "Audio Odigos app" and the "Digi Tour app" are compared in terms of positive average score, as Table 6 illustrates, it is found that the average score for positive reviews for the "Digi Tour app" is higher than the Audio Odigos app. In contrast, the average of negative and neutral sentiment was noted less for “Digi Tour app “comparatively with “Audio Odigos app,” which indicate that paid app has better quality than the free available app.

Table 4. Digi Tour app sentiment analysis results

Sentiment	Number of Reviews	Average Score
Positive	106	0.83008631
Negative	20	0.06770423
Neutral	01	0.48659369

Source: Sentiment analysis result

Table 5. Audio Odigos app sentiment analysis results

Sentiment	Number of Reviews	Average Score
Positive	53	0.798324382
Negative	08	0.277154329
Neutral	12	0.555454393

Source: Data analysis result

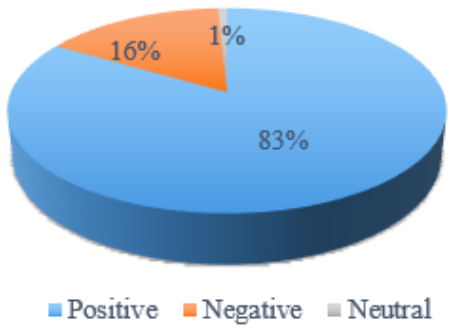

Figure 2. Pie chart reviews of Digi Tour app

Table 6. Comparative analysis

Sentiment	Number of Reviews Audio Odigos App	Average Score Audio Odigos App	Number of Reviews Audio Digi Tour App	Average Score Digi Tour App
Positive	53	0.798324382	106	0.83008631
Negative	08	0.277154329	20	0.06770423
Neutral	12	0.555454393	01	0.48659369

Source: Data analysis result

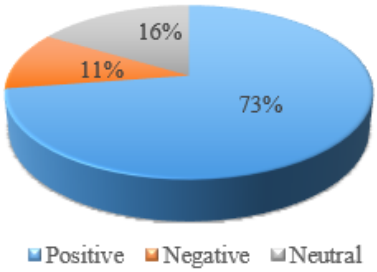

Figure 3. Pie chart reviews of Audio Odigos app

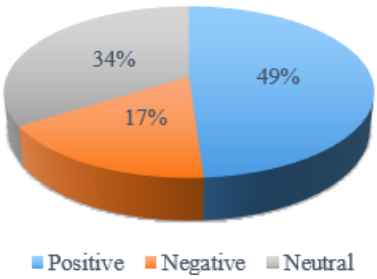

Figure 4. Pie chart for sentiments of Audio Odigos app

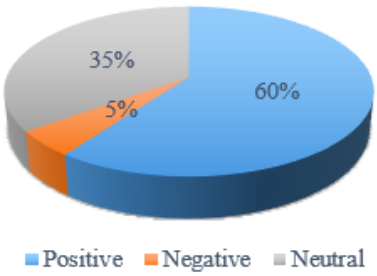

Figure 5. Pie chart for sentiments of Digi Tour app

Figures 4 and 5 show comparative average percentage of favorable, negative, and neutral sentiments of "Audio Odigos". And "Digi Tour app". 60% positive sentiment of the "Digi Tour app" are found favorable. It has been discovered that "Digi Tour app" users may be satisfied than "Audio Odigos app" users because of the positive words use by then in to the reviews.

6. DISCUSSION

Oline users feedbacks are playing an important role in improvement and development of the Smart guide apps. The right way analysis of the user's feedback gives a right direction to the smart guide app developers. In the sentiment analysis reviews read by the machine learning language, if positive comments, words, sentence used about app result will be positive for particular review. Similarly, if negative language results will negative for particular comment and neither negative nor positive in such case such comments consider as neutral. Furthermore, this sentiment analysis is very useful to save time to read large number of reviews, similar found in Jabbares e-commerce app study [29]. As manually processing required more time to evaluate issue faced by app users. App provider can read only negative reviews on app and they can response the issues immediately. Table 6 Indicate the comparative statistics of "Audio Odigos app" and "Digi Tour app" app user posted review after using the app. Based on their comments and sentences Digi Tour app found better than "Audio Odigos app" Furthermore the content analysis of negative reviews provides more information about why negative comments are there about the app and app provider can understand the issues and do the implementation in the app service. While posting comments users use positive words or sentences it indicate satisfaction of users from the service experience. Al-Otaibi et al. [30, 31] done research on satisfaction of users by using sentiment analysis. User-generated content on the internet, such as user reviews, posts, tags, ratings, and opinions, can be utilized as a business indication if collected and properly assessed. It will indicate satisfaction of customer. However, in this research "Digi Tour app" user found more satisfied as comparative Audio Odigos app. it's just because of different features of the app such as, sound, images, text, audio information quality, interactivity, facilitating condition, Use online or offline mode, App usefulness and Ease of use. and expectation of the app users from the app providers. Most of the positive comments are related with the image clarity, information quality and sound quality of the app and easy to operate which indicate that the while using smart guide app these are the first basic priority of the users.

7. IMPLICATIONS

The purpose of this study is to compare user reviews of STGA. The use of mobile apps, a modern technology that is popular among smartphone users, is directly and substantially influenced by their satisfaction and performance requirements [21]. However, study finding indicate there is no impact of purchase cost on uses sentiments about app. After using a mobile app, users can leave feedback, whether it's positive, negative, or neutral. The tourism sector relies heavily on online reviews as a source of information, thus it's crucial to know if they can be identified correctly in order to have an impact on travelers' choices. Examine and contrast the variations found in online traveler evaluations [19]. Furthermore, app developers need to focus on the app qualities and features such as sound, image adding more destination tour in the STGA.

Using mashing learning language, sentiment analysis of a large number of reviews can be completed in less time and at a lower cost. App providers can assess how satisfied users are with their services and determine the scope for implementation. It is much easier for travelers to plan their trips and select target locations to visit based on other people's reviews and experiences [10]. Other people's experiences have been important in making decisions in the selection of app so users generated content are important to do improvement in the STGA. However, outcome of this research will be useful for app providers and developers in terms of improvement in app.

8. CONCLUSION

In the era of smart tourism, most of the countries using Smart Tour Guide apps at museums, monuments etc. so According to aim of this research does the such STGA meet user expectations. Sentiment analysis of the smart guide apps users reviews and a comparative study has been done. According to the app selection set criteria, the apps "Digi Tour" and "Audio Odigos" are chosen for the research. Moreover, sentiment analysis result indicates that 83% users' reviews are favorable with positive sentiments which indicate

satisfaction of the users for "Digi Tour app" Because of its features such as sound, images, text, audio information quality, interactivity, facilitating condition, Use online or offline mode, App usefulness and Ease of use. Although the "Audio Odigos app" is free for users, only 73% users' reviews are favorable with positive sentiments which indicate satisfaction of the users for "Audio Odigos app" because they have used positive language in their review and app quality features. The comparative finding indicates that STGA is free of cost or users have to pay for the apps that is not impacting on their review about the app and also the download the same app. Study regarding app quality need to be do in the future. The user experience is generated by the correlation between product features and tourist perceptions and experiences. The effective implementation use of mobile AR applications is still restricted, notably in the tourism industry [32].

Sentiment analysis can be used to analysis of user reviews more quickly and economically. Reviews are a valuable source of information for app developers, once the positive, negative, and neutral sentiments have been sorted. Negative reviews must be addressed in order to improve the app services. A high percentage of positive sentiment indicates user satisfaction. As a result, it was discovered that the app needs to improve its services and need improvement on negative reviews. After analyzing a large number of reviews, it will be easier to work on remaining negative reviews and determine what app users expect from app providers.

9. LIMITATIONS AND SCOPE FOR FUTURE RESEARCH

The comparative study of this research is based on sentiment analysis its conducted by machine learning language and the finding of study based on sentiment in user review. so, need to use another method in the future research. Only 73 reviews were available for "Audio Odigos" app and 127 for "Digi Tour app" in January 2023 in Google play store in numbers for both the app. However, a smaller number of review's analyzed in this research. According to set selection criteria of app only Two app taken for the research. However, it is suggested that for future research, such comparative study can be done with another app with sentiment and content analysis because content analysis determines what needs to be improved for app user satisfaction. Since every app is unique in terms of its features and qualities—such as text, images, sound, and audio quality—as well as its interactivity and enabling conditions, Use the app for offline or online, download it for free or pay for it, and rate its usability and ease of use.

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