

# The Vumba Tourist Aid Mobile Application

NJODZI RANGANAI<sup>1</sup>, NICHOLAS GOTAMI<sup>2</sup>, LEMIAS ZIVANAI<sup>3</sup>, COLLETOR T. CHIPFUMBU<sup>4</sup>, MERCY NYASHA MAGOSO<sup>5</sup>, PAUL SAMBO<sup>6</sup> AND GLORIA EVERGRACE MAWERE<sup>7</sup>

---

## Abstract

*The Vumba region of the Mutare District, Manicaland Province, Zimbabwe, has been experiencing problems with disjointed and unavailable information regarding local attraction sites, accommodation and cultural sites in the region. The research seeks to create and test the Vumba Tourist Aid (VTA) mobile application as a digital tool in assisting tourists in planning trips and travelling. The research takes a mixed-methods research approach, involving quantitative survey and qualitative feedback that was used to evaluate user experience and effectiveness. The study sample included both domestic and international tourists who visit the Vumba region and a sample size of 120 was used which was selected using convenience sampling. A structured*

---

<sup>1</sup> Department of Information and Marketing Science, Midlands State University, Gweru, Zimbabwe, rangana1981@gmail.com, <https://orcid.org/0000-0003-0451-1417>

<sup>2</sup> Department of Computer Sciences and Information Systems, Manicaland State University of Applied Sciences, Mutare, Zimbabwe, nicholasgotami@gmail.com, <https://orcid.org/0009-0007-9327-069X>

<sup>3</sup> Department of Information and Marketing Science, Midlands State University, Gweru, Zimbabwe, zivanail@staff.msu.ac.zw, <https://orcid.org/0000-0001-9145-3272>

<sup>4</sup> Department of Information and Marketing Sciences, Midlands State University, chipfumbuc@staff.msu.ac.zw, <https://orcid.org/0000-0001-6933-9246>

<sup>5</sup> Great Zimbabwe University, Department of Mathematics and Computer Sciences, Masvingo, Zimbabwe, mmagoso@gzu.ac.zw, <https://orcid.org/0009-0007-9461-5098>

<sup>6</sup> Great Zimbabwe University, Department of Mathematics and Computer Sciences, Masvingo, Zimbabwe, psambo@gzu.ac.zw, <https://orcid.org/0000-0001-8299-152X>

<sup>7</sup> Department of Mathematics and Computer Sciences, Great Zimbabwe University, Masvingo, Zimbabwe, gmawere@gzu.ac.zw, <https://orcid.org/0009-0008-6003-8285>

*survey and in-app usage analytics were used to collect data to measure parameters like ease of navigation, information accessibility, user satisfaction and general effect on travelling experience. Results show that 82% of the interviewees found geo-navigation very helpful, 76% were interested in background information in their native language. The majority of the interviewees said they had a more interactive and fulfilling tourist experience using geo-navigation than under the guidance of conventional tourism guides. The findings show that the VTA app can be an invaluable tool in marketing tourism, improving tourist satisfaction and, perhaps, driving tourist attraction to Mutare. The research suggests to add the local business data and updates in real time to enhance the utility of the app even more.*

**Keywords:** digital tourism tools, geo-navigation, tourist experience, travel planning.

## **INTRODUCTION**

The tourism sector has played a major role in the economic development of most economies in the modern era, especially due to globalisation and the advent of technologies (Khan *et al.*, 2020). Online and mobile applications have provided a wide range of information to travellers regarding destinations, attractions and accommodation. In this regard, the creation of a tourist assistance application can significantly help tourists and the tourism sector in Zimbabwe (Moyo *et al.*, 2025). The app will be able to give crucial information like maps, directions, reviews and individual recommendations of activities, depending on the interest of the traveller. Moreover, the app also has the potential to market local business and attractions which will further improve the overall experience of tourism and boost the levels of satisfaction and loyalty of the tourists. It will also provide useful information to tourism stakeholders, by helping them to improve services and infrastructure (Kar *et al.*, 2023). The

project will develop an easy-to-use and interactive application with a user-focused design strategy, real-time navigation, customised recommendations and language translation, and provide scalability to support updates in the future. It will be developed with a multidisciplinary team that will focus on software development, user experience design, tourism marketing and data analytics and will collaborate with stakeholders and potential users (Buhalis *et al.*, 2023). The aim of this initiative is to boost tourism experience and encourage sustainable practices which eventually will boost the revenue of local businesses and tourism at large. In the following sections, the process of the design and development of the app, methodologies, technologies applied, challenges and user testing outcomes will be discussed and recommendations to make the app better in the future (Kumar *et al.*, 2024).

## **BACKGROUND TO THE STUDY**

One of the best tourist destinations are the Vumba Mountains that have a world class golf course at the Leopard Rock Hotel, waterfalls, rare wildlife species, hiking trails and beautiful botanical garden. The creation of a tourist assistance application responds to the changing demand of contemporary tourists as they can now access a lot of information about their destinations via their phones and the internet (Harun *et al.*, 2024). Nevertheless, such information is overwhelming and it may be difficult to plan the trips. Conventional information, such as guidebooks, may not have real-time updates and recommendations tailored to the specific needs of a tourist which can be offered by a tourist aid application and improve the travelling experience (Mishra *et al.*, 2024). The tourism sector will be improved by the app as more tourists will be satisfied and loyal to the tourism sector which, in turn, will result in more revenue to local businesses. It also has the potential to provide useful data to stakeholders to enhance services and infrastructure. Earlier research is in favour of such

apps and recognises the difficulties. An example, Zhou *et al.* (2024) has mentioned the advantages of real-time information and personalisation and expressed worries about the accuracy and security of the data. The importance of the user-centred design in designing an appealing experience that boosts satisfaction and loyalty was highlighted (Nyagadza *et al.*, 2025). Moreover, Koens *et al.* (2021) emphasise the sustainability of tourism in the development of the app to reduce adverse effects on the environment. Therefore, a multidisciplinary philosophy that takes into consideration the needs of users, challenges facing the industry and sustainability, is key to designing a tourist aid app that does not only optimise the tourism experience, but also leads to the sustainable development of the tourism sector in Zimbabwe.

Mobile technology and internet have dramatically changed the tourism industry by giving travellers a lot of information on the destination, accommodation and activities (Cramariuc and Nastase, 2024). Although it has led to the accessibility of information, research indicates that the volume of information and sources of information that have been fragmented may make trip planning more complex, causing stress and decreased satisfaction to tourists. Conventional media, including guidebooks and websites, that are not dynamic, do not necessarily include personalised recommendations, are not interactive and are, therefore, not as useful in improving tourist experiences (Hien and Trang, 2024). In Zimbabwe, especially in the Vumba area of the Mutare District, there is a lack of empirical studies recording the manner in which visitors access and utilise information when visiting. Early surveys and regional tourism feedback show that most tourists are faced with problems of navigation, accessing credible local information and language barriers, leading to poor travel experiences (Alsharif *et al.*, 2025). To fill these gaps, this study aims at coming up with a Vumba Tourist Aid (VTA) mobile

application, offering real time information, geo-navigation and language assistance, based on personal interests. Another goal of the app is to encourage sustainable tourism, as it will direct tourists to places of lesser interest and local enterprises. The key issue informing the study is, therefore: How can a mobile application be planned and put in place to increase tourist satisfaction and experience in the Vumba region of Zimbabwe and deliver real-time, personalised and accessible information?

The overall aim of the research is to design and test the VTA mobile application to provide better tourist experience, access to information and efficient planning and navigation in the Vumba area of Zimbabwe. To this end, the research aims to address the general research question: How can a mobile application be designed and realised to enhance tourist satisfaction, information accessibility and efficiency in navigation in the Vumba region to enhance a more enjoyable and an informed travelling experience?

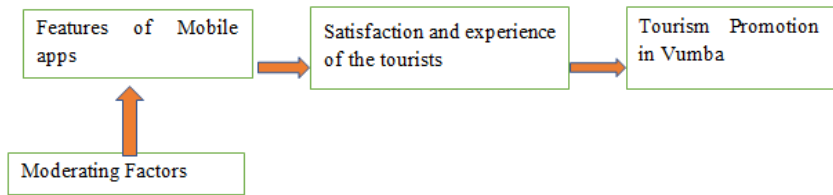
The implications of developing the VTA app towards the tourism sector and travellers in particular are immense as it has essential library applications incorporated in it which can assist travellers in planning their trips, setting up accommodation and activities to perform in the course of their stay in Mutare. With all this information collected in one location, tourists will save time and energy on planning their trip, therefore making their travels easier (Pencarelli, 2020). The VTA application features customised recommendations to travellers, depending on their interests and preferences. To a greater extent, tourist aid applications may also give travellers safety and security information, including safety areas to avoid or contact information in case of an emergency and can make travellers feel safer and more confident to explore a new destination. Similarly, the creation of the VTA app can be beneficial to local

communities, so long as they understand that the app will include local businesses and attractions, therefore, can also be used to stimulate tourism in the area that will bolster the local economy.

## **CONCEPTUAL AND THEORETICAL APPROACHES**

The article is supported by the Technology Acceptance Model (TAM) (Davis, 1989) which assumes that the attitudes of users towards the new technology, perceived usefulness and perceived ease of use (PEU), determine its acceptance and adoption. Using the TAM, the VTA application is created to be easy to use and useful to tourists by offering them real-time information, language translators and navigational service. The app will also focus on enhancing the user experience and perceived value to boost tourist interaction, satisfaction, adoption and improve the overall travel experience to promote sustainable tourism in the Vumba region (Tran and Khoa, 2025). The conceptual framework that the present study is based on, connects the independent variables (the features of mobile app language translation, distance calculators, interactive maps and live information) to dependent variables (satisfaction of a tourist, the efficiency of navigation and the experience of the whole traveling process). Some of the moderating factors that have been put into consideration by the framework include network availability, user engagement and digital literacy. Independent variables include language translation, distance calculation matrix, interactive maps and geo-navigation, and real time updates. Dependent variables include tourist satisfaction, planning, navigation efficiency and travel experience. Moderating variables are digital literacy, network coverage, previous travel experience. Finally, outcomes will be improved tourist experience, accessibility, greater uptake of the app and local tourism promotion.

## POSSIBLE VISUAL PRESENTATION OF CONCEPTUAL FRAMEWORK



**Figure 1:** *The conceptual framework*

This structure would see the VTA app design reflect the research goals and questions directly, with the functionality of the app directly relating to quantifiable benefits in experience of the tourists, efficiency in planning and general satisfaction.

## LITERATURE REVIEW

Mobile applications are considered to be smartphone programmes that need internet connection and are usually downloaded via the Google Play and the Apple App Store (Gazzawe *et al.* 2022). With the emergence of mobile technology, the tourism industry has been redefined as companies have altered the way they engage and provide services to their customers (Brumen *et al.*, 2020). One of the innovations in the industry is the introduction of smart travel apps, which has improved the process of planning, navigation and the experience of the tourists (Sia *et al.*, 2023). Mobile applications that assist tourists have become popular due to their ability to give travellers handy features in planning their trips, geo-navigating the destinations and receiving information about the cultures and history of a particular place. Using social media can also increase customer participation as tourists will be able to exchange experiences and market applications (Kim *et al.*, 2020). Features as GPS and location-based services will provide real-time information and personal suggestions. The aspect of multilingual support has also been addressed as one of the

critical ones, enhancing the accessibility of various travellers. With these developments, issues like disintegration the bof tourism information in various sources continue to pose a challenge to tourists, who are confused and unable to plan their trips (Phoofolo, 2019). The presence of language barriers and cultural differences also aggravates these problems, as it becomes challenging to find credible information about the services in the country when it comes to international tourists (Escobar and Hall, 2025).

In alleviating these problems, the research suggests that a mobile application that incorporates real-time information, translators, geo-navigators and cultural guidance programme be developed. ICT implementation in tourism is associated with its great benefits, making the tourism more efficient, competitive and providing better services (Castley, 2025). The use of mobile applications that utilise real-time data can enhance user satisfaction and engagement to solve some issues that tourists experience when travelling to destinations and seeking information (Amaro and Fonseca, 2025). Tour guide mobile apps offer travellers an affordable, convenient and personalised experience of exploring attractions that include real-time details, navigation and recommendations (Chuang, 2020). Empirical research shows that tourists who employ such applications have better trip planning, time savings and greater navigation, which can be directly linked to the aims of the study to further increase accessibility in the region, language barriers and improved tourist satisfaction in the Vumba region. On the economic front, the applications make the use of professional tour guides unnecessary since mobile applications are cheaper and can be used as substitutes, and act as digital intermediaries in the tourism process (Erport and Fadlon, 2023). They also enable the tourists to travel independently with regard to privacy and enhancing self-directed experiences,

which is in line with user-friendly technology-based approaches suggested in tourism technology studies.

In practice, the applications can offer real-time information, maps, distance calculation matrices, routing, multi-language applications that can assist tourists in getting around unfamiliar destinations and surmount language and connectivity barriers. Offline accessibility also guarantees continuity of guidance that increases reliability and confidence of the user. Combining these results with the TAM, perceived usefulness of the VTA application is proven by the fact that it allows getting accurate, real-time, personalised travel information and the PEU is supported by the ability to use language translation, interactive maps and offline services. Experience shows that perceived usefulness and ease of use lead to greater tourist adoption, satisfaction and engagement that directly responds to the research objectives and questions on how to optimise the planning, navigation and overall tourist experience in the Vumba region (Van Hanh, 2024).

Mobile applications have been on the rise and have revolutionised the tourism industry by offering personalised, location-based and real time information to the traveller. Research reveals that these applications improve the experiences of tourists, as these apps are used to plan and navigate the trip and communicate after travelling (Gao *et al.*, 2025). As an example, the personalisation of recommendations can be optimised using big data analytics and machine learning and be more relevant to the preferences of the user, enhancing their satisfaction and interest in travelling (Alsahafi *et al.*, 2025). The Smart tourism ideas highlight how contextually relevant mobile technologies can be used to ensure the interactive and memorable experience (Qiao *et al.*, 2026).

Although these are the advantages, there are still barriers to adoption. The use of mobile applications by tourists is influenced by infrastructure constraints, privacy, network connectivity, cost of data and digital literacy levels (Karunaratna *et al.*, 2026). The ability to integrate GPS into apps has been highly identified as a very important aspect in the improvement of navigation and user satisfaction (Amin *et al.*, 2026). Empirical research also indicates that mobile apps assist travellers in three areas that include pre-travel (information search and reservation), travel (real-time directions) and post-travel (feedback and reviews) (Minyang, 2024). Examples of mobile usage to market local tourism include applications in Southern Africa, like the FNB Namibia Pocket Guide that bundles necessary information, but has limitations, such as the inability to support predefined personalised queries (Dube, 2024). These results show that the solutions, such as the Vumba VTA app that combine real-time data, language translation, geo-navigation and customised directions, are necessary to increase the travel experience in Zimbabwe.

Zimbabwe is endowed with a lot of natural and cultural resources yet the tourism sector in the country performs poorly as it is ranked low on the World Economic Forum Travel and Tourism Competitiveness Index (Epoh *et al.*, 2023). Although mobile applications have demonstrated a possibility of improving the experiences of tourists around the world, no single context-specific mobile platform that meets the specific needs of tourists visiting Zimbabwe, especially in places such as Vumba, has been integrated. The available literature indicates the usefulness of ICT in tourism, yet the majority of studies concentrate on global or generic applications, creating a gap in comprehending the possibility to customise mobile applications to local tourist spots and user segments. There is a critical lack of accessibility and inclusivity in terms of users with relatively low digital literacy and middle-aged and elderly tourists being

unable to use mobile applications to their fullest potential (Ooi *et al.*, 2022). Zimbabwe has also not developed a digital tourism ecosystem. Instead of integrating and scaling its isolated solutions, the digital tourism environment is fragmented, inhibiting the success of data-driven tourism strategies (Zeqiri *et al.*, 2025). Moreover, issues of privacy, legal frameworks and ICT infrastructure present adoption barriers, especially in developing settings where regulatory support and optimal access to technology is scarce (Olawale *et al.*, 2023). The proposed study aims to fill these gaps by creating the VTA mobile application that combines language translation, geo-navigation, real-time information and easy-to-use design to increase accessibility, improve tourism experience and sustainability in tourism development in the area. The study has a key contribution to the tourism sector in Zimbabwe by focusing on both the tech-savvy and the less digitally literate users and consolidating the scattered information into a single platform. It fulfills a critical need that has not been empirically studied in the tourism sector.

## **METHODOLOGY.**

The case study in the Vumba area in Manicaland Province, Zimbabwe, was conducted in terms of a case study to understand how a mobile tourist assistance application can positively impact tourist experiences, navigation and access to information. In the research, the sample was 120 people consisting of tourists visiting Vumba and employees of local tourism centres. To obtain a sample reflecting the proportion of tourists and staff, a sample was drawn as follows: tourists, 48 males (40%), 60 females (50%), 12 teenagers (10%); Staff, 10% of all the staff (10 participants). Purposive sampling was used to make sure that those who had relevant experience and knowledge on tourism activities in Vumba were included in the sample.

This research is based on an interpretivist research philosophy which focuses on the subjective experiences of individuals (Pervin and Mokhtar, 2022). This will fit into the research topic of interaction tourists have with the VTA application and its impact on travel experiences. The mixed-method research was used which involved interviews with a qualitative approach and observations with a quantitative approach. This strategy identified the user needs, preferences and usability requirements, coupled with giving quantifiable information on the interactions and satisfaction of the tourists. The approach is conducive to rigour, transparency and context-based insights (Wicaksono, 2024).

The semi-structured interviews were conducted with tourists and staff to investigate the issues influencing the experiences of tourism, access to information, language barriers, navigation and technology use; and the observations to document tourist behaviours, navigation and interactions with existing information sources. Interviews elicit detailed subjective information, but observations obtain real-time behavioural information to ensure triangulation and improve validity. This combination made it possible to gain a comprehensive understanding of the needs of users, gaps in their information and usability requirements of the VTA app. The use of graphs (charts, tables) increased the interpretability and reliability. This approach makes sure that a research is grounded in context, user-focused and empirically based, making possible the development of the VTA application, basing on the real tourist behaviour and requirements.

## **FINDINGS**

The section outlines the study findings and analysis on the linguistic and geo-navigation difficulties experienced by tourists in the Vumba region and how the VTA mobile application can

help solve these problems. A sample of 120 respondents (domestic and international tourists and staff at tourist attractions in Vumba) was used to collect data in a structured survey, interviews and in-app usage analytics. A mixed-methods approach helped the study to embrace both the quantitative data (e.g., ease of navigation, satisfaction scores) and the qualitative data (e.g., the perceptions of language barriers and cultural challenges).

**Table 1:** *Summary of demographics of tourist respondents*

| Participant | Age   | Gender | Education Level | Tourist Visited         | Site |
|-------------|-------|--------|-----------------|-------------------------|------|
| T1          | 25-29 | F      | Certificate     | Marindi Falls           |      |
| T2          | 30-34 | F      | Diploma         | White Horse Inn Hotel   |      |
| T3          | 35-39 | M      | Degree          | Vumba Mountains         |      |
| T4          | 30-34 | M      | Diploma         | Vumba Botanical Gardens |      |
| T5          | 40-44 | M      | Certificate     | Leopard Rock            |      |
| T6          | 35-39 | F      | Degree          | Prince of Wales         |      |
| ...         | ...   | ...    | ...             | ...                     |      |
| T120        | 50-54 | F      | Diploma         | Various                 |      |

Respondents represented a balanced mix of gender, ages and educational backgrounds, consistent with typical tourist demographics visiting Vumba. This aligns with prior research showing that education level influences understanding of cultural and heritage attractions (Gomes *et al.*, 2025).

Tourists reported several challenges affecting their overall experience in Vumba, summarised in Table 2.

**Table 2:** *Challenges affecting tourists*

| Challenge Type              | Percentage of Tourists Affected |
|-----------------------------|---------------------------------|
| Language barrier            | 67%                             |
| Geo-navigation difficulties | 100%                            |
| Poor network connectivity   | 100%                            |
| Cultural understanding      | 52%                             |

of Tourists said they had problems communicating because of the language barrier (67%). This has an impact on the safety perception and the overall satisfaction.. All tourists (100%), had to deal with issues of navigation which was aggravated by lack of network coverage. This supports Patel and Parmar (2022), who discovered that geo-navigation played a vital role in tourist satisfaction. More than half of the respondents (52%) reported that they found it challenging to learn the local culture making apps that can give information about the culture a necessity. Correlation analysis reveals that there is a strong positive correlation between network connectivity and geo-navigation effectiveness. Likewise, language issues were closely related with cultural knowledge issues.

#### **THE CONVERSATIONS WITH TOURISTS AND EMPLOYEES SHOWED MORE ABOUT THEIR EXPERIENCES**

There were difficulties in navigation, as many tourists reported being lost or making unnecessary routes. One of the participants said that,

“In the absence of the app, I would have missed a few sites as the road signs are confusing and the roads are not clear”.

Concerning language and understanding, non-local tourists were glad to be provided with information in their own languages, which increased their understanding of historical and cultural importance. A foreign tourist stated that.

“It was much more fun and meaningful when I read descriptions in my language”

On cultural interaction, the tourists emphasised the need to be aware of local practices. The cultural tips in the app helped avoid misunderstandings or unintentional offending. Perceived advantages of the app show that the users of the app reported time savings, confidence in being able to explore on their own and decreased stress. One of the respondents said that,

“The app would help make Vumba so easier to navigate and help me plan my day without having to ask people directions all the time.”

According to the staff at tourism centres, tourists who used the app were more self-reliant, active and willing to visit many attractions that did not require strict guidance and enhanced visitor satisfaction.

### **OVERCOMING LINGUISTIC AND GEO-NAVIGATION**

The quantitative measures and qualitative insights prove to be complementary to each other, the former positively affecting user satisfaction and travel experience. The research found out strategies assisted by quantitative and qualitative results:

- ✚ *Translation Services:* multilingual makes services more approachable, it also minimises the obstacle of communication.
- ✚ *Digital Maps and Signage:* Live navigation and aerial are used to guide tourists in exploring on their own and in an efficient way.
- ✚ *Cultural Guidance:* In-app tips and historical background enhance the understanding and respect of local culture.
- ✚ *Real-Time Updates:* Updates about attractions, events, or service changes enhance planning and minimise the use of unreliable physical signage.

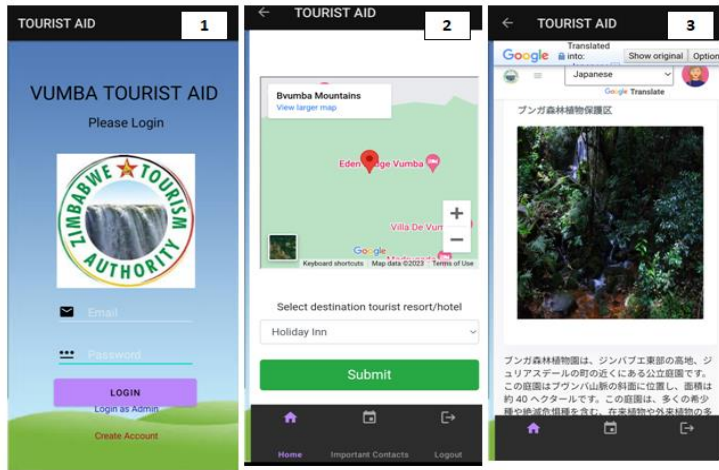
In-app usage analytics and user feedback survey methods were used to evaluate the VTA app. Important results are: Geo-navigation, 82% of users rated the navigation tools of the app as

very useful in finding attractions and planning directions. Translation of languages, 76% of the users were delighted by the ability to obtain information on the site in their own language which minimised the problem of communication. General satisfaction, 79% of tourists reported that they had better experiences with the new guides than the conventional guides, attributing it to the interactivity, convenience and confidence in navigation.

The findings imply that the VTA app can be used to address underlying challenges in tourist experiences because of its capacity of providing real-time information, translation services and good geo-navigating. The tourists observed that the app reduced stress, saved time and offered an enhanced experience with local sites. The results prove that language, geo-navigation and cultural factors significantly influence tourist satisfaction in Vumba. The VTA mobile application is the answer to these issues because it is able to provide real-time navigation, multiple language information and cultural guidance. Both visitors and staff noted that the app facilitated navigation, comprehension and communication. The study recommends the addition of local business information, offline capabilities and real-time alerts to make the application even more helpful and promote tourism in the Vumba region.

#### **THE DEVELOPMENT OF VUMBA TOURIST AID MOBILE APPLICATION.**

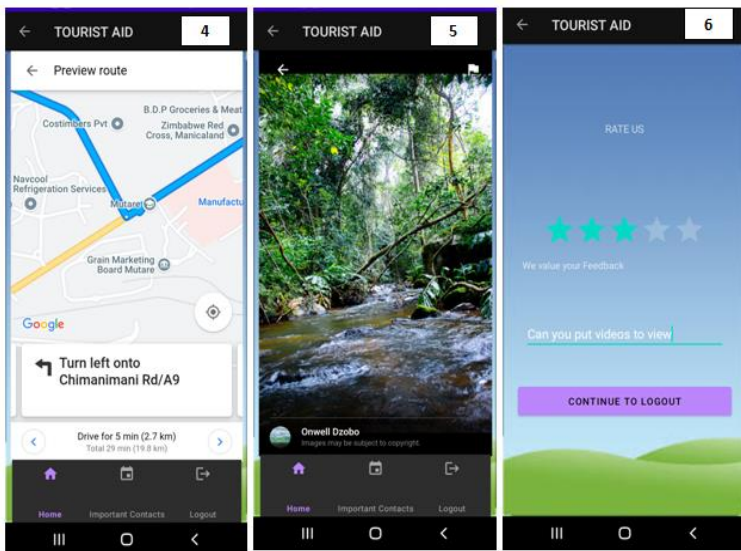
Figures 2 and 3 represent the dashboard interfaces of the VTA mobile application. The first three (3) objectives can be achieved by the language translation inbuilt feature, therefore, breaking the language barrier which has previously been experienced in the tourism industry. On the latter two (2) they are pegged on the satisfaction of the tourists, therefore, they have been achieved since the first three objectives have been achieved.



**Figure 2:** *Dashboard and Functions of the VTA*

Key

- 1- Login page, 2- Destination selection window, 3 - Language selection and translation window



**Figure 3:** *Navigation screenshots of the new system*

Key:

4 - Geo-navigation facility, 5 - more pictures of target destination and, 7 - user feedback

## **DISCUSSION**

A mobile application targeted at tourists is a multifaceted process that includes multiple stages, such as ideation, implementation and testing. Following the development and launch of the application, the following discussions were raised following the outcomes of developing the Vumba Tourist Aid mobile application. The application depends entirely on network connection even though ideal in showing the navigation features. Nevertheless, Vumba region is always experiencing network connectivity issues, consequently frustrating tourists in gaining maximum advantages of using the VAT mobile application. The application is fairly easy to use due to its specific purpose and its simplicity but, unfortunately, its buttons are difficult to press and one has to make multiple clicks to get one acknowledgment. As it must be user-friendly, it needs certain modifications to ease the use of the application. The user feedback must be appreciated, measured and/or taken into account in an ongoing process of refining the mobile application until it meets high expectations of the tourists at any given time. The most interesting features of the mobile application that contributed more to the success of the objectives were accomplished, are more focused on Google APIs connected with the system. It could be critical to devise algorithms to replace Google APIs so that developers can own the entire application.

## **CONCLUSIONS AND IMPLICATIONS OF THE RESEARCH.**

Geo-navigation, cultural, linguistic and internet infrastructure are some of the challenges that tourists visiting Zimbabwe are experiencing, ultimately affecting tourist experience and tourism development. Due to a need to improve tourism in the

Vumba region, the study led to the realisation of the character of the tourists and the difficulties that they encounter. Finally, the Vumba Tourist Aid mobile application to be used by tourists was created. The tourists that visit the Vumba region are people spread out in every corner of the world with diverse cultures, backgrounds, beliefs and values that could at one time or another be an obstacle to their satisfaction when they go on tours and visits. Tourists are likely to depend on brochures and websites to enjoy the sites they are visiting even though such materials lack sufficient real-time information as may be necessary. Government and telecommunications stakeholders need to have a stable internet infrastructure that facilitates the geo-navigation process of the VTA mobile application. It is necessary that tourists adopt the application since this prevents most of the deplorable issues they encounter, which can be threats to the tourism industry (Mpfu, 2024). By using the mobile application, tourists are able to make arrangements to their destinations in the comfort of their homes and enjoy backgrounds of such chosen destinations. Moreover, they are able to pre-appreciate geo-locations of the places to be visited by viewing maps, distances, directions and respective time required to travel. An intensive strategy on improving tourism can change the experiences of the tourists and the development of tourism in general (Ratnasari *et al.*, 2020).

The study findings of the VTA mobile application have important implications on tourism development, technology adoption and policy in Zimbabwe. To begin with, the study has shown that mobile technology can be successfully used to overcome the issues of geo-navigation, language barriers and cultural awareness among tourists. The high percentage of respondents who reported their satisfaction with travel experiences increased as a result of using digital tools, showing that visitor satisfaction can be increased using digital tools to generate repeat visit and positive word-of-mouth recommendations. This

underscores the fact that the tourism industry can be transformed through the use of mobile applications to provide real-time and personalised and easily accessible information that can be utilised in making destinations like Vumba competitive (Zindi *et al.*, 2024). Second, the study has implications for local tourism operators and businesses. By adding real-time information on accommodation, attractions and recreation services, the app enables tourists to make more plans and decisions which, in turn, may lead to increased patronage and income generation by local business (Mishra *et al.*, 2024). Moreover, the existence of multilingual resources and cultural orientation can be used to promote inclusiveness, thereby enabling foreign tourists to experience a successful experience with the local heritage and practices, which can help in preserving culture.

Third, the study can be used to inform policy and strategic planning in the Zimbabwe tourism sector. This is because the established effectiveness of the VTA app suggests that investment in digital tourism infrastructure can be effective in making the industry more resilient, particularly in the context of disruptive events globally such as pandemics or economic limitations (Castro and Dieguez, 2024). Such lessons will help policy-makers and other stakeholders concentrate on initiatives that are technologically inclined, lead to greater integration of ICT and develop some frameworks that foster innovation and safeguard privacy of users and data. Finally, the study would contribute to the existing academic literature by providing empirical evidence of the benefits of mobile-assisted tourism in the developing world to illustrate the gaps in the existing systems and guide further research on the sustainable, technology-driven tourism solutions (Ramendra *et al.*, 2025). Overall, the research emphasises that mobile applications like VTA could play a crucial role in enhancing tourist experience,

boosting local economic development and tourism competitiveness of Zimbabwe within the region and internationally.

Based on the findings of the study, several recommendations are proposed to ensure the VTA mobile application is more efficient and how digital tourism should be studied in the future. To begin with, the VTA app must be proposed to make it more language-rich and accessible to accommodate more tourists, including those who do not speak the more common languages or are not digitally savvy. It can involve voice-based navigation, multilingual audio guide and offline capabilities which can assist in addressing connectivity problems and make the user experience more inclusive (Jeseo and Lindsey, 2025). Second, and possibly the most important, it will be necessary to collaborate with local tourism operators and stakeholders to make sure the application is updated with the right and real-time data on attractions, accommodation, transport and cultural events. This will give the tourists valid information, boost satisfaction and economic development in the local areas (Gong *et al.*, 2025). Linkages to social media platforms can also encourage tourists to communicate in a bid to form digital marketing and promote Vumba as a destination. Third, tourists and local staff should be provided with training and awareness campaigns so that the rate of adoption and successful use of the application can be increased. Tourists who may have minimal familiarity with mobile technology may require some guidance on navigation capabilities, interactive services and employee contributions will ensure that the content is correct and receptive to any questions raised by the tourists. In the future, research could be carried out to evaluate the long-term impact of digital tourism tools on tourist behaviour, satisfaction and repeat visitation rates. The usability and scalability of mobile tourism apps may be tested in comparative research of different regions of Zimbabwe or Southern Africa (Vava, 2024). In addition, understanding how to integrate artificial

intelligence and predictive analytics into tourism apps can also result in a more effective personalised recommendations and ability to predict needs of the users more efficiently, which may also contribute to enhancing visitor experiences. Overall, the the study indicates that the introduction of technology in the tourism industry not only provides solutions to existing challenges, but also leads to sustainable development, higher visitor satisfaction and competitiveness of Zimbabwe as a tourist destination.

The creation and implementation of the VTA mobile application experienced various problems which could have affected the research results and point to the direction of bettering the application. In the development process, external data integration (e.g., Google Translate APIs) introduced technical challenges because of incompatible protocols that took time. The user-friendly interface was also a challenge to design since it was it was hard to determine a layout that would be acceptable to all potential users, although this is a very important aspect of the interface to ensure ease of use. The restricted development time also limited opportunities to implement and test the advanced features completely and the compatibility with some Android versions also limited their implementation to all possible users. Also, constraints of the study context and literature were noted. Not every tourist is equipped with a smartphone, or has regular access to the internet, which can diminish the usefulness of the app, and although it was provided in several languages, the less common languages were not supported fully, causing limitation of access. The app might have gaps in the cultural guidance and not all tourists might want to use new technologies that will influence the engagement (Silva *et al.*, 2024). Technical problems like a sluggish loading process, connection errors and bugs may further decrease usability. Overcoming such obstacles by providing offline access, supporting more languages, culturally

relevant content, engagement incentives and intensive testing, is important to enhance the effectiveness of the app and the experience of tourists in Vumba.

## 7.0 REFERENCES

- Alsahafi, R., Mehmood, R. and Alqahtany, S. (2025). A Machine Learning-based Analysis of Tourism Recommendation Systems: Holistic Parameter Discovery and Insights. *International Journal of Advanced Computer Science and Applications*, 16(1).
- Amaro, S. and Fonseca, P. (2025). Enhancing Tourist Engagement through Mobile Applications. *Leveraging Digital Marketing for Tourism: Exploring Strategies and Applications in Contemporary Tourism Markets*, 111-126. Cham: Springer Nature Switzerland.
- Amin, N. M. *et al.* (2026, April). Functionality, Reliability and Satisfaction: A Users' Retrospective Evaluation of the UPTM's Class Attendance Management and Monitoring (UCAM) System. Available online: <https://www.atlantispress.com/proceedings/icar-t1-25/126023540>.
- Brumen, B. *et al.* (2020). Use of Mobile Technologies in Tourism: Natural Health Resorts Study. *Mediterranean Journal of Social Sciences*, 11(4), 1.
- Buhalis, D., Lin, M. S. and Leung, D. (2023). Metaverse as a Driver for Customer Experience and Value Co-Creation: Implications for Hospitality and Tourism Management and Marketing. *International Journal of Contemporary Hospitality Management*, 35(2), 701-716.
- Castley, J. G. (2025). Wildlife Tourism. *Encyclopedia of Tourism*, 1127-1128. Cham: Springer Nature Switzerland.
- Castro, C. and Dieguez, T. (2024). Charting Economic Resilience: Examining Fiscal Policy Adjustments during the COVID-19 Pandemic, with a Focus on Tourism Sector Dynamics and ICT Incorporation. Available online: <https://doi.org/10.20944/preprints202404.0510.v1>

- Chuang, C. M. (2020). A Current Travel Model: Smart Tour on Mobile Guide Application Services. *Current Issues in Tourism*, 23(18), 2333-2352.
- Cramariuc, O. and Nastase, C.E. (2024). The Interplay between Information and Communications Technology Solutions Development and Millennial Visitors' Behavior in Refining Smart Tourism Destinations. Proceedings of the International Conference on Modern Trends in Business Hospitality and Tourism, 323-339. Cham: Springer Nature Switzerland. Available online: [https://link.springer.com/chapter/10.1007/978-3-031-75883-6\\_20](https://link.springer.com/chapter/10.1007/978-3-031-75883-6_20).
- Davis, F. D. (1989). Technology Acceptance Model: TAM. Al-Suqri, MN, Al-Aufi, AS: *Information Seeking Behavior and Technology Adoption*, 205(219), 5.
- Dube, K. (2024). The State of Technology Deployment in South Africa's Tourism and Hospitality Industry. In: Ndhlovu, E., Dube, K., and Shereni, N.C. (eds.). *Tourism and Hospitality for Sustainable Development: Volume Two: Emerging Trends and Global Issues*, 149-161. Cham: Springer Nature Switzerland.
- Epoh, H. H., Ewondo Mbebi, O. and Nzepang, F. (2023). Should the World Economic Forum's Global Tourism Competitiveness Index be Improved? *Tourism Critiques: Practice and Theory*, 4(1-2), 48-74.
- Erport, Y. and Fadlon, T. (2023). Economic Maneuvering: How States Evade Economic Sanctions. *Strategic Assessment: A Multidisciplinary Journal on National Security*, 26(2), 90-109.
- Escobar, S. D. and Hall, C. M. (2025). Integrating Smart Cities and Tourism Systems: A Critical Review. *International Journal of Public Sector Management*, 38(2), 196-212.
- Gao, Z. et al. (2025). What Makes Users Recommend their Mobile Travel App? Findings from an Innovation Diffusion and Social Exchange Theory Perspective. *International Journal of Tourism Research*, 27(5), e70117.

- Gazzawe, F. *et al* (2022). [Retracted] The Role of Machine Learning in E-Learning Using the Web and AI-Enabled Mobile Applications. *Mobile Information Systems*, 2022(1), 3696140.
- Gómez, S. *et al.* (2025). Ocean Literacy in Managing Marine Protected Areas: Bridging Natural and Cultural Heritage. *Frontiers in Marine Science*, 12, 154-163.
- Gong, J., Xiang, C. and Knight, D. W. (2025). Spatial Variations in Tourism Sustainability Perceptions: A Multi-Group SEM Analysis of Gateway Communities in New National Parks. *Tourism Recreation Research*, 2025, 1-18.
- Harun, M. M., Hamat, R. and Ibrahim, H. (2024). Adapting to the Era of Independent Tourism: Challenges and Opportunities for Travel Agencies. *Borneo Engineering and Advanced Multidisciplinary International Journal*, 3(2), 49-56.
- Hien, H. N. and Trang, P. H. (2024). Decoding Smart Tech's Influence on Tourist Experience Quality. *Asian Journal of Business Research Volume*, 14(1), 97-119.
- Jeseo, V. and Lindsey Hall, K. K. (2025). A Framework for Inclusive Service Experiences (FISE): Bridging the Gap between Traditional and Immersive Offerings. *Journal of Service Theory and Practice*, 35(5), 805-831.
- Kar, A. K., Choudhary, S. K. and Ilavarasan, P. V. (2023). How Can We Improve Tourism Service Experiences: Insights from Multi-Stakeholders' Interaction. *Decision*, 50(1), 73-89.
- Karunaratna, D. *et al.* (2026). Unveiling the Digital Pathways: Exploring the Key Drivers Behind Travelers' Decision-making in Smart Tourism-A Systematic Literature Review. *Journal of Hospitality and Tourism Insights*, 9(2), 648-667.
- Khan, N. *et al.* (2020). Factors Affecting Tourism Industry and its Impacts on Global Economy of the World. Available at SSRN 3559353.
- Kim, B., Yoo, M. and Yang, W. (2020). Online Engagement among Restaurant Customers: The Importance of Enhancing Flow for Social Media Users. *Journal of Hospitality and Tourism Research*, 44(2), 252-277.

- Koens, K. *et al.* (2021). The Smart City Hospitality Framework: Creating A Foundation for Collaborative Reflections on Overtourism that Support Destination Design. *Journal of Destination Marketing and Management*, 19, 100376.
- Kumar, S. *et al.* (2024). Applications, Challenges and Future Directions of Human-in-the-Loop Learning. *IEEE Access*, 12, 75735-75760.
- Minyang, L. (2024). Study on the Influence of Travellers' Satisfaction with Intercity Smart Travel and their Choice Behavior: Based on Their Heterogeneity (Master's thesis).
- Mishra, D., Das, S. and Patnaik, R. (2024). Application of AI Technology for the Development of Destination Tourism towards an Intelligent Information System. *Economic Affairs*, 69(2), 1083-1095.
- Moyo, J., Chari, F. and Mutsvangwa, S. (2025). Exploring the Potential of Digital Tourism Innovations for Climate Change Adaptation in Zimbabwean Rural Communities in Manicaland Province, Zimbabwe. Available online: <https://doi.org/10.21203/rs.3.rs-7466297/v1>
- Mpofu, F. Y. (2024). The Fourth Industrial Revolution Technologies in the Tourism Sector in African Countries: Opportunities, Barriers and Ethical Considerations. In: Ndhlovu, E., Dube, K., & Shereni, N. C. (eds.). *Tourism and Hospitality for Sustainable Development: Volume Two: Emerging Trends and Global Issues*, 179-201. Cham: Springer Nature Switzerland.
- Nyagadza, B. *et al.* (2025). Customer Experience (CX) in Virtual Realms: A Theories-Contexts-Characteristics-Methodologies (tccm) Guided Bibliometric Study. *Journal of Global Marketing*, 2025. 1-29.
- Olawale, M. A. *et al.* (2023). A Review on the Intersection of Artificial Intelligence on Building Resilient Infrastructure, Promoting Inclusive and Sustainable Industrialization and Fostering Innovation. *Int. J. Eng. Modern Technol*, 9(3), 1-31.

- Ooi, C. S. *et al.* (2022). Intention to Learn Social Networking Sites among Malaysian Older Adults: A Qualitative Perspective. *Ageing 2022 (NCA 2022)*, 41.
- Patel, K. and Parmar, B. (2022). Assistive Device Using Computer Vision and Image Processing for Visually Impaired: Review and Current Status. *Disability and Rehabilitation: Assistive Technology*, 17(3), 290-297.
- Pencarelli, T., Gabbianelli, L. and Savelli, E. (2020). The Tourist Experience in the Digital Era: The Case of Italian Millennials. *Sinergie Italian Journal of Management*, 38(3), 165-190.
- Pervin, N. and Mokhtar, M. (2022). The Interpretivist Research Paradigm: A Subjective Notion of a Social Context. *International Journal of Academic Research in Progressive Education and Development*, 11(2), 419-428.
- Phoofolo, T. A. (2019). Tourism Disasters, Crises and the Risk-Fear Nexus: Tourists Perceptions of Durban as a Tourism Destination. Doctoral Dissertation, University of Kwazulu-Natal, Howard College.
- Qiao, G. *et al.* The Impact of Smart Tourism Technologies on Senior Tourists' Perceptions of Equity and Memorable Experiences. *Journal of Hospitality and Tourism Management*, 66, 101415.
- Ramendra, D. P. *et al.* (2025). Artificial Intelligence-based Virtual Tour for Vocational High Schools in Tourism Sector in Developing English Language Competence for Guides. *International Journal of Language Education*, 9(1), 81-100.
- Ratnasari, S. L. *et al.* (2020). An Experience of Tourism Development: How is the Strategy? *Journal of Environmental Management and Tourism*, 11(7), 1877-1886.
- Sia, P. Y. H., Saidin, S. S. and Iskandar, Y. H. P. (2023). Systematic Review of Mobile Travel Apps and their Smart Features and Challenges. *Journal of Hospitality and Tourism Insights*, 6(5), 2115-2138.

- Silva, C., Zagalo, N. and Vairinhos, M. (2024). Engagement Guidelines for Cultural Tourism Mobile Applications. *Área Abierta*, 24(3), 221.
- Tran, A. V. and Khoa, B. T. (2025). The Impact of Mobile Augmented Reality on Green Experience and Destination Choice Intention in Green Tourism in Vietnam. *Geo Journal of Tourism and Geosites*, 58(1), 136-145.
- Van Hanh, N. T. (2024). Tourists' Perception of Technology Adoption in the Tourism Industry and Innovative Strategies for Integration. In: Bijalwan, A., Bennett, R., & Mohanty, S. N. (Eds.). *Creative Approaches Towards Development of Computing and Multidisciplinary IT Solutions for Society*, 291-301.
- Vava, B. (2024). All-weather Friend? Chinese ICTs in Zimbabwe As General Purpose Technologies (GPTs). University of Johannesburg (South Africa). Available online: <https://www.proquest.com/openview/b269d9b8cca990edeec268c98d3af66a/1?pq-origsite=gscholar&cbl=2026366&diss=y>
- Wicaksono, T. (2024). The Experiential Retail Phenomenon: A Quality Analysis and Perceptual Disparities among Customers in the Adoption of Hungarian SMEs Retail. Doctoral dissertation, Magyar Agrár-és Élettudományi Egyetem.
- Zeqiri, A., Ben Youssef, A. and Maherzi Zahar, T. (2025). The Role of Digital Tourism Platforms in Advancing Sustainable Development Goals in the Industry 4.0 Era. *Sustainability*, 17(8), 3482.
- Zhou, T. et al. (2024). Application of Artificial Intelligence in Physical Education: A Systematic Review. *Education and Information Technologies*, 29(7), 8203-8220.
- Zindi, B., Ndhlovu, E. and Mhlanga, D. (2024). The Digital Evolution of Global Tourism and the Practical Lessons for African Small Businesses. In: Mhlanga, D., & Dzingirai, M. (eds.). *Sustainable Finance and Business in Sub-Saharan Africa*, 447-471. Cham: Springer Nature Switzerland.