GPS ENABLED

VIRTUAL TEMPLE TOUR

Submitted in partial fulfillment of the requirements for the award of Bachelor of Engineering Degree in Computer Science and Engineering

By

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BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of **HARI VISU V R (Reg. No: 39110369) and GOKULA KRISHNAN(Reg.No:39110336)** who carried out the project entitled "**GPS ENABLED VIRTUAL TEMPLE TOUR**" under my supervision from January 2023 to April 2023.

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Abstract:

Mobile app development is the creation of software applications designed specifically to function on portable devices like smartphones, tablets, and other digital assistants. These applications can be pre-installed on devices during the manufacturing stage or accessed through server-side processing via web-based apps. The expansion of mobile app development has led to job creation and increased profits from ventures across Europe's 28 member states, with predictions of around 529,000 direct jobs in the "app economy."User interface design is a crucial component in mobile application development, accounting for different aspects such as input capabilities and screen size limitations. The objective is to create a user-friendly UI that enables effortless device interaction while considering mobility constraints and context-specific features. Mobile UI contexts signal cues from user activity, such as location and scheduling, that can be shown through user interactions within a mobile app. Functionality is supported by mobile enterprise application platforms or integrated development environments (IDEs).

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LIST OF ABBREVIATIONS

ABBREVIATIONS	DEFINITION
API	Application Programming Interface
SDK	Software Development Kit
UX	User Experience
UI	User Interface
MVP	Minimum Viable Product
QA	Quality Assurance
DB	Database
IDE	Integrated Development Environment
CMS	Content Management System
APK	Android Application Package
HTML	Hypertext Markup Language
CSS	Cascading Style Sheets
JS	JavaScript

CHAPTER 1

INTRODUCTION

Mobile App development is act or process by which a mobile app is developed for mobile devices, such as personal digital assistants, enterprise digital assistants or mobile phones. These software applications are designed to run on mobile devices, such as a smartphone or tablet computer. These applications can be pre- installed on phones during manufacturing platforms, or delivered as web applications usingserver-side or client-side processing (e.g., JavaScript) to provide an "application-like"experience within a web browser. Application software developers also must consider a longarray of screen sizes, hardware specifications, and configurations because of intense competition in mobile software and changes within each of the platforms. Mobile app development has been steadily growing, in revenues and jobs created. A 2013 analyst reportestimates there are 529,000 direct *app economy* jobs within the EU than 28 members (including the UK), 60 percent of which are mobile app developers.

As part of the development process, mobile user interface (UI) design is also essential in the creation of mobile apps. Mobile UI considers constraints, contexts, screen, input, and mobility as outlines for design. The user is often the focus of interaction with their device, and the interface entails components of both hardware and software. User input allows for the users to manipulate a system, and device's output allows the system to indicate the effects of the users' manipulation. Mobile UI design constraints include limited attention and form factors, such as a mobile device's screen size for a user's hand(s). Mobile UI contexts signal cues from user activity, such as location and scheduling that can be shown from user interactions within a mobile app. Overall, mobile UI design's goal is mainly for an understandable, user-friendly interface. Functionality is supported by mobile enterprise application platforms or IDEs.

Front-end development tools are software applications that aid in creating, building, and examining user interfaces for websites and mobile applications. Popularly used tools include JavaScript, CSS/HTML editors like Angular or React frameworks, prototypingutilities such as Figma and Sketch, and testing platforms like Selenium or Cypress. Regularupdates are necessary to ensure compatibility with current programming languages and tech advancements.

Back-end servers are geographically separate from front-facing parts like user interfaces or portable applications, communicating with them via APIs. Designing back-end servers depends on specific system requirements, using varying programming languages, frameworks, and databases. Optimal design optimization techniques ensure scalability, reliability, and security standards are met, requiring continuous assessment updates towards maintenance management either by independently managed cloud service providers or specialized teams.

Mobile app testing is essential in assessing applications designed for mobile devices, ensuring they function seamlessly across all platforms, meet acceptable user standards, and are efficient on various devices. Several steps are involved, including test planning, test environment setup, manual testing, automated testing, performance testing, security testing, usability testing, and regression testing. Appium, Xamarin Test Cloud, and TestFlight are examples of tools used for mobile app testing.

Mobile app development has been revolutionizing the way people interact with technology. With smartphones being ubiquitous, the potential for mobile apps is limitless. From simple games to complex business solutions, there is an app for everything. In this context, it is interesting to explore the possibilities of using mobile apps to enhance our spiritual experiences.

Tamil Nadu is home to numerous temples, each with its unique history, architecture, and rituals. These temples attract millions of devotees every year from across the world. With the advent of technology, it is now possible to experience the magic of these temples from the comfort of our homes. Mobile app development has been playing a significant role in enabling this.

A well-designed mobile app can provide users with detailed information about various temples in Tamil Nadu. This can include information about the history of the temple, its significance, the rituals performed, and the festivals celebrated. Users can also access images and videos of the temple, along with 360-degree virtual tours, allowing them to explore the temple's architecture and ambiance.

Mobile apps can also help users plan their visits to these temples. The app can provide details about the temple timings, directions to reach the temple, and the best time to visit.

Users can also use the app to book tickets for various events and pujas in the temple.
In addition, mobile apps can also provide users with real-time information about the crowds in the temple. With the app, users can check the queue status and plan their visit accordingly, avoiding long waits. This can also help in maintaining social distancing, an important aspect in today's world.

Mobile apps can also provide users with a platform to share their experiences and connect with other devotees. The app can have a dedicated section for user-generated content, where users can share their pictures, videos, and stories about their temple visits. Users can also connect with each other through the app, forming a community of like-minded individuals.

Another interesting feature that a mobile app can offer is the ability to perform virtual pujas. Users can choose their preferred deity and perform pujas from their homes, using the app's interactive features. This can be a boon for those who are unable to visit the temple due to various reasons.

Mobile apps can also serve as a platform for temple authorities to connect with their devotees. The app can provide the temple authorities with real-time feedback from the users, enabling them to improve the temple's facilities and services. It can also be used to promote various events and festivals, encouraging more people to visit the temple.

Moreover, mobile apps can provide users with information about nearby temples, enabling them to plan their temple visits better. This can be especially useful for those who are new to the city or state. Users can also use the app to book accommodation near the temple, making their visit more comfortable.

Mobile app development for temples in Tamil Nadu can also have commercial benefits. The app can have a dedicated section for local vendors and shops, enabling them to promote their products and services to the devotees. This can include prasadams, souvenirs, and other religious items. The app can also provide users with information about nearby restaurants and cafes, making their visit more enjoyable.

Mobile app development for temples in Tamil Nadu can also have cultural

significance. The app can provide users with information about the various cultural events and festivals celebrated in the temple. It can also promote the local art and culture, by showcasing the works of local artists and artisans.

There is no application where a user can get all detail, history, location of temples, hotels, cabs…. So, this application has been developed.

CHAPTER 2

LITERATURE SURVEY

Many studies have emphasized the importance of mobile apps in enhancing visitor experience and engagement with historical sites and cultural attractions.

Research has found that mobile apps can improve visitor satisfaction by providing accurate and up-to-date information about the temple and its surroundings. Apps can also offer interactive features such as audio and video guides, augmented reality, and virtual tours that allow visitors to explore the temple virtually.

Studies have highlighted the potential of virtual tours to create a more immersive experience for visitors. Virtual tours can provide visitors with an in-depth understanding of the temple's history, architecture, and cultural significance. Research has shown that virtual tours can increase visitor engagement and satisfaction, and even promote repeat visits.

Mobile apps can also serve as a marketing tool to promote the temple to a wider audience. Studies have emphasized the importance of promoting cultural heritage and tourism through digital channels. Mobile apps can be used to target specific segments of the population, such as millennials, who are more likely to use mobile technologies when traveling.

However, there are challenges in developing effective mobile apps for cultural tourism. One challenge is the need to balance between providing enough information to satisfy visitors' needs while avoiding information overload. Another challenge is to ensure that the app is user-friendly and accessible to all visitors, including those with disabilities or limited access to technology.

Overall, the literature review highlights the potential of mobile apps in promoting temple cultural tourism. By providing accurate and engaging information, virtual tours, and interactive features, mobile apps can enhance visitor experience and satisfaction, and promote cultural heritage to a wider audience. However, there are challenges that need to be addressed in developing effective mobile apps for cultural tourism.

2.1. Temple Cultural Tourism

In this section, we first introduce Temples and discuss the temple cultural tourism in Tamil Nadu Then, the VR applications installed on mobile devices for temple guidance are reviewed. Under the impact of urbanization, traditional folk culture and arts are facing a great dilemma in terms of preservation, and local culture is gradually in danger of disappearing,

and temples are almost becoming the last reserves of these folk cultures and arts. The protection of temple culture is a way to preserve Taiwan's intangible cultural heritage so that these valuable folk arts can be passed on through folk beliefs and local temples can sustain operations through the boost of tourism. The continued conservation of folk art and culture creates a sense of identity and continuity and promotes the development of cultural diversity and pluralism. Intangible cultural heritages are a treasure shared by all people in Taiwan. They are the gems of wisdom from the ancestors' lives, an important asset in shaping unique style in a culturally homogenized world and an essential medium for bringing Taiwan's cultural content and characteristics to international attention [6, 7]. This study, by using the example of Temples in Kumbakonam, aims to look into its background to learn about the past with literature review, and by collecting the characteristics of religious tourism and organizing and analyzing the factors driving tourists to engage in religious and cultural sightseeing tour, it can, based on the analyzed data, identify the specific direction for development and serve as a basis for projecting the development of the functions of the tour guidance system. We have gathered information about the people, events, objects, and environment concerning the Temple through historical and documentary materials, which have served as a reference for the planning and design of the guiding system, and then collected books, documents, cultural and historical materials, and data on websites related to the shrine, in order to gain a preliminary understanding of the historical background and local culture, as well as to find out the historical and cultural references of the shrine and to use these materials as a basis for research. Established over 800 years ago, the Gangaikonda cholapuram Temple in Kumbakonam is the most representative shrine in Thanjavur. Gangaikonda cholapuram Temple is dedicated to Lord shiva deity, who is well versed in astronomy and geography and is a skilled healer, specializing in the treatment of maladies and saving countless lives. It is said to be so effective that, in later times, he was revered as the "God of Death," a deity to whom people pray for good health. One of the most special features of all temples worshipping is that there are divination prescription slips available in the temple. Therefore, for patients or their families, they can come to the temple to pray for the protection of the gods and also to seek prescriptions and then get blessings from the god. In general, this type of prescription slips is no different from drawing a bamboo divination stick to ask for good fortune. However, before drawing the slip, apart from praying, one must also give a statement of one's condition to the deity and then draws a bamboo stick from the stick box and throws divination blocks to determine whether it is suitable for a prescription. Since the belief in healing is more or less helpful to the illness, the belief in

Rajendra chola has persisted for hundreds of years, making the temple building, sacrificial items, and festivals distinct from other shrines and becoming a unique temple in the region. This study aims at exploring the cultural tourism resources of temples from the perspective of religious tourism, and through the example of the Gangaikonda cholapuram temple, a guided tour system of the temple has been built to convey the unique Tamil culture and to probe into its temple architecture, religious impressions, etc. By virtue of the impression and attractiveness of the destination, this study analyses the advantages of the development of religious and cultural tourism and uses a virtual model to integrate the tour system into the temple so that, through the explanation of specific displays and ritual activities in the temple, the visitors and worshippers can be impressed and moved, with the purpose of transmitting cultural messages and interpreting cultural language.

Temple cultural tourism is a type of tourism that is focused on the cultural and spiritual significance of temples. It is a form of religious tourism that is growing in popularity as people seek to explore the history, art, and architecture of temples.

One of the primary attractions of temple cultural tourism is the opportunity to experience the unique customs and traditions associated with each temple. Visitors can observe temple ceremonies and rituals, participate in religious events and festivals, and learn about the cultural and spiritual significance of various religious practices.

Temple cultural tourism also offers the chance to explore the architecture and artwork of ancient temples. Many temples are historical landmarks, with unique architectural features that reflect the influence of various cultures and periods of history. Visitors can marvel at the intricate carvings, sculptures, and paintings that adorn the walls and ceilings of these temples.

In addition to their cultural and artistic significance, temples also play an important role in promoting wellness and mindfulness. Many temples offer meditation and yoga classes, as well as other wellness practices that promote relaxation and spiritual growth.

However, temple cultural tourism also faces challenges, such as maintaining the authenticity and cultural significance of the temples, preserving the historical and artistic value of the temples, and managing the environmental impact of tourism on the surrounding areas. Temple cultural tourism offers a unique and enriching experience for those seeking to explore the cultural and spiritual significance of temples. It provides an opportunity for

visitors to learn about the history and culture of different regions, and to gain a deeper appreciation of the spiritual traditions that have shaped the world.

2.2 PROBLEMS IN EXISTING SYSTEM

Geometry-based method can provide users with high interactivity and high immersion, but using this method to develop highly realistic artificial environment is time-consuming. In contrast, the image-based method can produce highly realistic artificial environment in a shorter time, making it a possible alternative to the geometry-based method. The virtual effect of the image-based method is to use the images of photos to be stitched together to develop a realistic panoramic virtual environment. Furthermore, it can use zoom in/out edges in artificial environments and perform hot-spot jumps and 360-degree panning between several artificial environments to achieve navigation. Compared with the geometry-based method, the navigation function developed using the image-based method is limited. Especially, when the scale of the scene is large or the surface details of the objects in the scene are more complicated, the time consumed for modelling and rendering will increase sharply, and the requirements for hardware will also be relatively high.

There can be several problems with the existing system of a temple details app. Some of them are:

- Inadequate information: The existing system may not have enough information about the temple, its history, and other related aspects. This can result in a poor user experience for the app users.
- Poor user interface: The existing app may have a poor user interface that is difficult to navigate and not user-friendly. This can result in a frustrating experience for users.
- Limited functionality: The existing system may have limited functionality, which means that users cannot access all the information and features that they need. This can result in users seeking alternative apps or sources of information.
- Poor performance: The existing app may suffer from poor performance issues such as slow loading times or crashes, which can lead to a negative user experience.
- Inadequate security: The existing app may have inadequate security measures in place, which can lead to user data being compromised or stolen.
- Inconsistent data: The existing system may have inconsistent data, which can lead to confusion among users and inaccurate information being displayed.
- Lack of personalization: The existing app may not have the ability to personalize user

experiences, which can lead to a lack of engagement and reduced usage.

- Compatibility issues: The existing system may have compatibility issues with certain devices or operating systems, which can limit the app's user base and reduce its effectiveness.
- Lack of updates: The existing app may not receive regular updates, which can lead to outdated information and functionality. This can also result in the app becoming obsolete over time.
- Limited accessibility: The existing app may not be accessible to all users, such as those with disabilities, which can limit its usefulness and appeal.

CHAPTER 3
REQUIREMENTS ANALYSIS

3.1 Feasibility Study

The feasibility study is conducted to determine the viability of the project in terms of technical, financial, operational, and legal aspects. The feasibility of the project can be evaluated based on the following factors:

- Technical Feasibility: The project requires the use of NLP algorithms, data extraction techniques and text matching models. These technologies are readily available and can be implemented using various programming languages such as Python, R, or Java. Therefore, the project is technically feasible.

- Financial feasibility: The project requires investment in software development, hardware infrastructure, and data storage. The cost of the project can be estimated by considering the development team size, hardware and software requirements, and the time taken to complete the project. The financial feasibility of the project is determined by conducting a cost-benefit analysis, which shows that the benefits outweigh the costs. Therefore, the project is financially feasible.

- Legal feasibility: The project must comply with the legal requirements related to data privacy and protection. The system must ensure that the collected data is not misused or shared with unauthorized parties. The legal feasibility of the project is determined by conducting a legal review, which shows that the project complies with the legal requirements related to data privacy and protection. Therefore, the project is legally feasible.

Conclusion:
Based on the feasibility study and risk analysis, it can be concluded that the\is project is technically feasible, financially viable, operationally feasible, and legally compliant. The potential risks associated with the project can be mitigated by implementing appropriate measures. Therefore, the project is recommended for implementation.

3.2 SOFTWARE REQUIREMENTS SPECIFICATION DOCUMENT

A Software Requirements Specification (SRS) document is a comprehensive guide that outlines the features, functionalities, and requirements of a software application. Here are 40 lines about what should be included in a Software Requirements Specification document for a mobile app:

- Introduction: The document should provide an overview of the mobile app, its purpose, and its intended audience.

- Scope: Define the features and functionalities that the app will provide and what it will not include. Requirements: List all of the functional and non-functional requirements of the app, including user requirements, system requirements, and performance requirements.

- User Interface: Provide detailed descriptions of how the user will interact with the app.

- Use Cases: Describe the different use cases of the app and how the user will interact with it in each scenario.Data Model: Define the data model that the app will use to store and retrieve information.

- Security: Detail the security measures that will be implemented to protect
- user data.

- Performance: Describe the performance requirements of the app, including speed, response time, and scalability.

- Compatibility: Specify the mobile devices and operating systems that the app will be compatible with.

- External Services: List any external services that the app will need to integrate with, such as payment gateways, social media platforms, or third-party APIs.

- Localization: Detail any localization requirements, including language support and

regional variations.

- Error Handling: Define the error handling mechanisms that the app will use to handle exceptions and errors.

- Testing: Describe the testing procedures that will be used to verify the functionality and performance of the app.

- Documentation: Specify the documentation that will be created, including user manuals, help files, and technical documentation.

- Performance Metrics: Define the performance metrics that will be used to measure the performance of the app.

- System Architecture: Provide an overview of the system architecture of the app, including the server, database, and client-side components.

- Deployment: Detail the deployment procedures that will be used to deploy the app to the app store or other distribution channels.

- Maintenance: Define the maintenance procedures that will be used to maintain the app after it has been deployed.

- Upgrades: Detail how the app will be upgraded and how users will be notified of updates.

- Analytics: Specify the analytics tools that will be used to measure the usage and performance of the app.

- Performance Monitoring: Define the performance monitoring tools and procedures that will be used to monitor the app's performance.

- Backup and Recovery: Detail the backup and recovery procedures that will be used to ensure the app's data is secure and recoverable in case of a disaster.

- Scalability: Describe how the app will be scaled to accommodate growing user bases.
- Resilience: Define how the app will maintain functionality in the event of a failure or outage.
- User Management: Define the user management mechanisms that will be used to manage users and their access to the app.
- Version Control: Specify the version control system that will be used to manage the app's source code.
- Legal Requirements: Detail any legal requirements that the app must comply with, such as data privacy laws or accessibility guidelines.
- Intellectual Property: Specify any intellectual property rights that apply to the app or its components.
- Performance Tuning: Define the procedures that will be used to optimize the app's performance.
- Privacy: Define the privacy policies that will be implemented to protect user data and privacy.
- Accessibility: Specify the accessibility requirements that the app must comply with to ensure that it can be used by people with disabilities.
- Third-party libraries: Specify the third-party libraries or frameworks that the app will use.

3.2.1 Front-end development tools:

Front-end development tools are focused on the user interface and user experience (UI-UX) and provide the following abilities:

- UI design tools
- SDKs to access device features
- Cross-platform accommodations/support.

3.2.2 Back-end servers:

Back-end tools pick up where the front-end tools leave off, and provide a set of reusable services that are centrally managed and controlled and provide the following abilities:

- Integration with back-end systems
- User authentication-authorization
- Data services

3.2.3 Android Studio

Android Studio is the official integrated development environment for Google's Android operating system, built on JetBrains' IntelliJ IDEA software and designed specifically for Android development. It is available for download on Windows, macOS and Linux based operating systems. Android Studio provides a unified environment where you can build apps for Android phones, tablets, Android Wear, Android TV, and Android Auto.

3.3 Image-based VR

Real images are used based on computer technology to create a virtual world that is comparable to our real environment. Since geometry-based VR is relatively expensive and takes longer to create, image-based VR, built on panoramic image technology, was created as a result. Image-based VR uses a camera, a tripod, and image-based VR editing software to present the viewer's surroundings in a cylindrical or spherical field of vision as a still image in VR. Today's digital cameras are evolving rapidly, making image-based VR production even easier. Developers can create the most realistic virtual scenes in a fraction of the time. Image-based virtual reality (VR) is a type of VR technology that uses a collection of still images to create a virtual environment. It is a form of 3D modeling that allows users to interact with a realistic representation of a real-world space. The process of creating an image-based VR involves capturing a series of high-resolution images of the environment, either by using a camera or through photogrammetry.

These images are then stitched together to create a seamless panoramic view. Image-based VR technology is often used in real estate, architecture, and tourism industries, allowing potential buyers or visitors to virtually explore the space before visiting it in person.

It can also be used in the gaming industry, creating immersive environments for players to explore. To view image-based VR, users typically wear a VR headset or use a computer or mobile device with a VR application. The VR technology simulates the experience of being physically present in the virtual environment, allowing users to look around and interact with the space. Image-based VR has several advantages over other types of VR technology.

It is less expensive to create and requires less processing power to render. It also provides a more realistic representation of the environment, as it is based on real-world images. However, image-based VR also has limitations. It requires a large number of high-resolution images to create a realistic environment, which can be time-consuming and costly to produce. It also does not allow for real-time interaction, as the environment is pre-rendered. Overall, image-based VR technology is a valuable tool for creating immersive virtual environments that can be used in a variety of industries.

CHAPTER 4

DESCRIPTION OF PROPOSED SYSTEM

4.1 Methodology

The Delphi method is being increasingly used in investigation of variety of local, regional, and global issues among stakeholders in which a consensus is to be conducted . Some of these areas included the development of information systems, and this method is also proven a popular tool to extract the unbiased information for a panel of experts. Therefore, it would be appropriate to adopt the Delphi method for obtaining a set of major dimensions and indicators established for the target touring mobile information system from the expert opinions. In the Delphi method, a series of condensed questionnaires is delivered to a group of experts, and their expert opinions are thus collected and examined to establish reliable technologies at a consensus. Here, several rounds of questionnaire responses were collected in an anonymous and non-face-to-face manner. After all questionnaire responses were investigated, the results along with new questionnaires were distributed to the experts as the reference for revising prior opinions. This process was repeated until disagreement among the experts was minimized and a concrete consensus was formed. The common advantages of the Delphi method are that the group composed of experts with various backgrounds can discuss a given topic from diverse perspectives and thereby extend the width of conclusions. Through the statistical data and opinions collected from the multiple rounds of questionnaire responses, a set of indicators was established for the expert's consensus initiatives. To create a successful temple details app, a methodology needs to be in place to ensure a well-designed, user-friendly, and functional application. Here are 30 possible steps to follow in the methodology process:

Define the purpose and objectives of the temple details app. Research and analyze similar apps in the market. Create a list of features to include in the app, such as temple information, images, location, history, events, and more. Develop a wireframe or prototype to visualize the app's layout and navigation. Test the wireframe/prototype with a group of potential users to receive feedback and make necessary changes. Decide on the technology stack to use for the app's development. Plan and organize the development process, including task delegation and timelines. Start the development process by building the basic structure of

the app. Use an iterative development approach to improve the app's features and functions. Use an Agile methodology to ensure the app's development is flexible and adaptive to changes. Conduct testing and debugging to ensure the app is functional and user-friendly. Create a database to store and manage the app's data. Ensure that the app is compatible with different devices and operating systems. Integrate social media and other marketing tools to promote the app. Provide a login system for user accounts and profiles. Develop an easy-to-use search and filter system for the app's content. Incorporate multimedia features such as images, audio, and video to enhance the user experience. Ensure that the app is optimized for speed and performance. Implement security measures to protect user data and prevent hacking. Create a user manual or tutorial to guide users through the app's features. Test the app's compatibility with different screen sizes and resolutions. Develop a system for user feedback and support. Test the app's performance and functionality in different environments. Release the app on multiple app stores and platforms. Monitor and analyze user feedback to improve the app's features and functions. Use data analytics to track user behavior and app usage. Provide regular app updates to improve the app's functionality and address any bugs or issues. Monitor the app's performance and security to prevent issues. Provide customer support and respond to user inquiries and issues. Continue to develop and improve the app based on user feedback and technological advancements.

Fig 4.1: Methology

4.2 Delphi Procedure

The Delphi method adopted in this research consisted of two rounds. In the first stage, 10 experts of relevant domains and objective perspectives were invited to provide their opinions

through the Delphi questionnaire surveys. These experts could express their opinions freely. The aim of this stage was to enable brainstorming among the experts, rather than posing restriction on the experts' scope of thinking. When an expert found any dimension or indicator listed in the questionnaire insufficient or inappropriate, the expert was asked to provide their additional comments and suggestions. The questionnaire comprised three main dimensions and nine indicators. The experts were asked to rate the importance and feasibility of each indicator according to a 5-point Likert scale, with anchors of 1 (strongly disagree) and 5 (strongly agree) [32]. After the first round of questionnaire, we adopted content analysis to classify expert opinions, after which they developed the second-round questionnaire. Higher scores represented greater importance and practical feasibility of VR development for temple tour guiding. Delphi procedure is a type of subroutine used in the Delphi programming language, which is an Object Pascal-based language. Procedures are a way to group a series of statements together so they can be executed multiple times. A procedure in Delphi can take zero or more parameters and can return a value or not. In Delphi, procedures are defined using the "procedure" keyword followed by the name of the procedure and the parameters enclosed in parentheses. The procedure block is enclosed in "begin" and "end" statements.

Delphi procedures can be used to perform a wide range of tasks, from simple calculations to more complex operations such as file manipulation and database access. Procedures can be called from other procedures, from the main program, or from other units in the same project. Delphi procedures can be used to implement event handlers for user interface elements such as buttons and menu items. Procedures can be overloaded, meaning that multiple procedures with the same name but different parameters can exist within the same program.

Procedures can be used in conjunction with other programming constructs such as loops and conditional statements to create complex logic. In Delphi, procedures can be defined at the global level or within a class. Procedures can be organized into units, which are modular components of a Delphi program. Procedures can be declared as virtual or abstract, allowing them to be overridden in descendant classes. Procedures can be used to implement various types of sorting algorithms such as bubble sort, quicksort, and merge sort. Procedures can be used to manipulate arrays and other data structures. Procedures can be used to implement error handling and exception handling logic. Procedures can be used to implement multithreading in Delphi applications.

Procedures can be used to access external libraries and APIs. Delphi procedures can be used to implement various types of encryption and decryption algorithms. Procedures can be used to implement network communication and socket programming. Procedures can be used to implement various types of mathematical functions and algorithms.

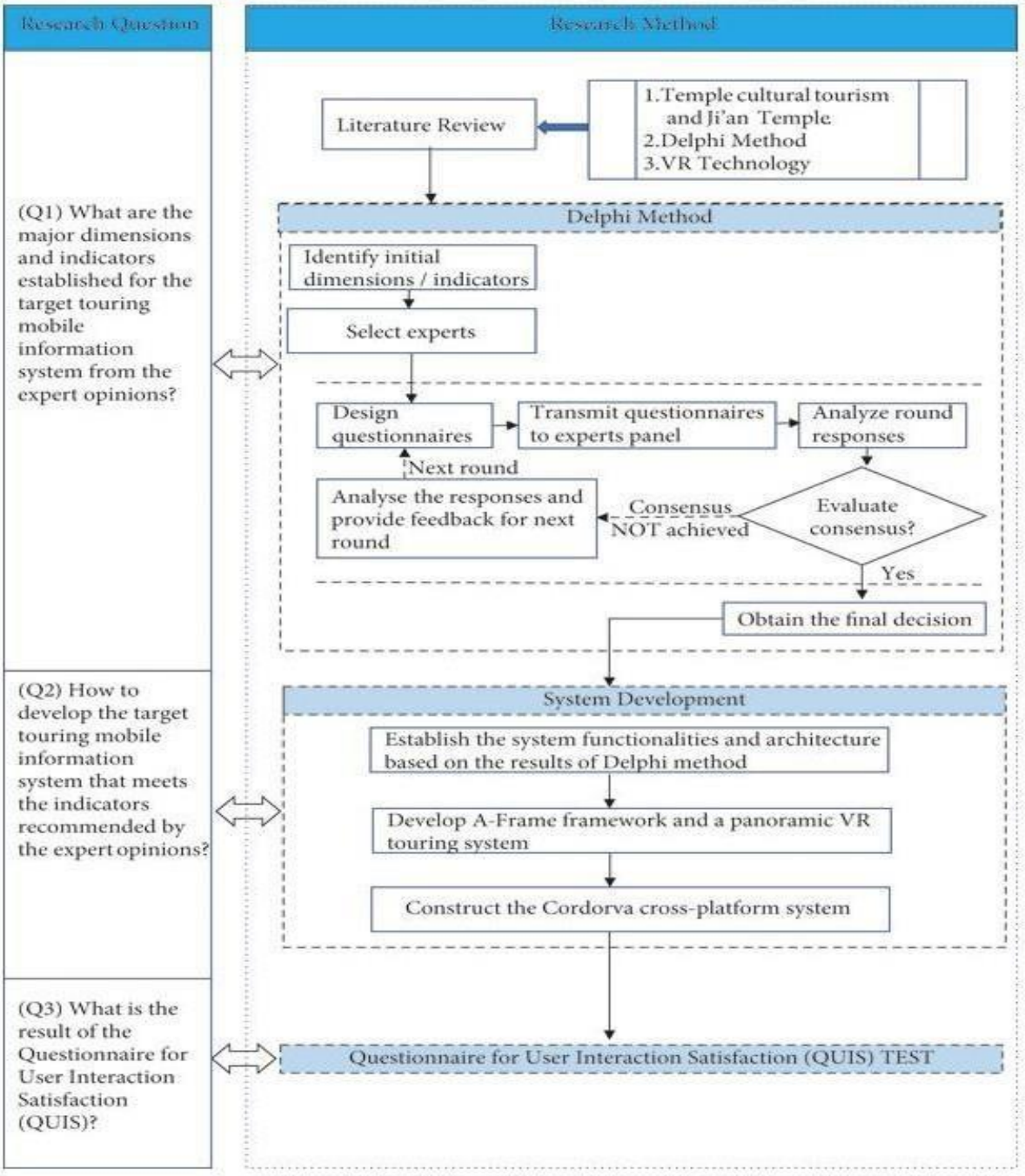

Fig 4.2: Delphi Procedure

4.3 Criterion Measure

In this research, we adopt some evaluation criteria [26, 33-36] to rank the importance of each of the component. This measurement includes the mean value (M), the standard deviation (SD), and the quartile deviation (QD). Furthermore, to assess agreement among experts, the stopping criteria are measured by using the coefficient of variation (CV) and Kendall's coefficient of concordance (W) [37]. Therefore, the comparison criteria are described as follows:

Suppose that indictor *j* is given the rating judged by the expert *i*, where there are intotal *n* indictors and *m* experts' judges.(1)The mean value (**M**) of the total rating given to indictor *j* is defined as(2)The standard deviation (**SD**) of the total rating given to indictor *j* is defined as(3)The quartile deviation **(QD)** of the total rating given to indictor *j* is defined aswhere and represent the 1st quartile and the 3rd quartile of the indictor *j*, respectively.(4)The coefficient of variation (**CV**) of the total rating given to indictor *j* is defined as(5)Kendall's coefficient of concordance (**W**) [14, 18] of the total rating is defined aswhere the sum of squared deviations, *S*, is defined as*T* is a correction factor for tired rating:in which is the number of tied rating in the *i*th group having the same constant value of tied rating and is the number of groups of ties in the set of rating for expert.

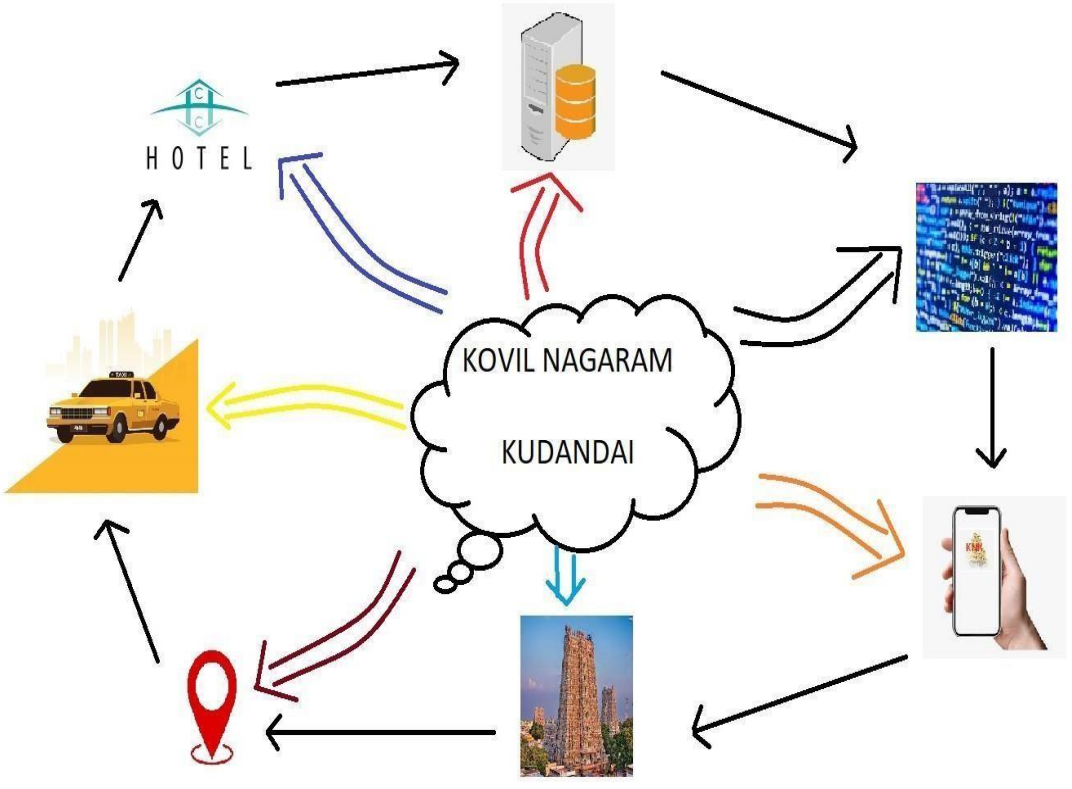

Fig 4.3: Application Contents

4.4 Consensus Criteria

To obtain consensual and important opinions from a group of experts in this study, the major statistics used in the Delphi method are a measure of central tendency (**M**), level of dispersion (**SD** and **QD**), and level of agreement and stability (**CV** and **W**). In general, the use of mean value to represent the central tendency is favoured [26–30]. Table 1 shows the level of importance based on the 5-point Likert scale. An indictor's mean score of more than 4.2 ("very high important"), or more than 3.5 and less than or equal 4.2 ("high important") is recommended in the first round of Delphi procedure. A higher mean value indicates more importance of the critical factor. Furthermore, after justifying the mean value, standard deviations and quartile deviations are then identified to measure the amount of variation or dispersion of items. shows the level of variation or dispersion according to **SD** and **QD.** In this study, the dispersion level is divided into three levels (high, moderate, and no consensus). The dispersion level is accepted as high if **SD** is less than or equal to 1 and **QD** is less than or equal to 0.5 [38, 39]. A low deviation indicates that the values tend to be close to the mean value (**M**), while a high deviation indicates that the values are spread out over a wider range. Moreover, we adopt the coefficient of variation (**CV**) and Kendall's coefficient of concordance (**W**) to determine whether a consensus has been met or not. It is an important issue to know when to stop the Delphi procedure. If the procedure is finished too early, the results may not be significant; and, if the process has too many rounds, the task may be too heavy to the experts and consequently contribute to withdrawals [38–40]. Table 3 shows the level of consensus determined by **CV** and **W**. For example, the level of consensus value ($0.8 < \mathbf{CV}$ and $0 \leq \mathbf{W} \leq 0.3$) shows a weak level of agreement of the experts' opinion, but still needs for additional round.

4.5 Algorithm Used:

Here we are using filter algorithm to filter the details provided by the used.Like, if the user wants to filter the hotel details with ratings, price …. They can we the filter option. This filter option will list the hotels based on the filter options asked by the user. Some of the filtering algorithms

1) BLOOM Filter
2) KALMAN Filter
3) SERVLET Filter

CHAPTER 5
Functions and Developments

5.1 VR Touring System Framework and Development

In this study, we use the Delphi method by the experience and intuition of experts to integrate the criteria for finding the functionalities of the interactive VR touring system accurately. Moreover, according to Table 5, the system functionalities and system architecture are then established. This section provides an overview of the system functionalities and architecture. Finally, the A-Frame framework and panoramic VR construction process are also described.

5.2 System Functionalities

The local culture of Taiwan is conveyed through the system that allows the faithful and tourists to understand the history of the place. Therefore, after collecting in-depth information on the historical background and cultural references of the Jian Temple as wellas visiting the site and interviewing the visitors, we found out that the general users would like to use the system to achieve the following purposes:(1)Planning and design of a site- specific guided tour to provide visitors with an understanding. As temples are interacting with people and are constantly being updated in the flow of time and space, the temples themselves are showcases that allow visitors to learn and experience culture in a way that is not only spiritual but also subliminal. VR allows users to get to know the environment of the temple and the order and location of the rituals so that they can learn about it without being there.(2)By completing the planning of the guided tours, the temple grounds can become an exhibition space, which will not only attract visitors but also bring in crowds and give a different impression and experience to religious tourism. The VR application also allows users to learn about the history of the temple and the stories of the deities without ever visiting the site.

Therefore, we have initially summarized the three major dimensions and nine indicators for the actual construction of the virtual temple space in the form of an interactive tour and VR technology, and through the Delphi method, an expert group decision-making technique, we have implemented two rounds of questionnaires and conducted a round-robin feedback process to integrate the opinions of various experts, from which we have selected the important indicators for the application of VR in interactive tours, which have been agreed

upon by the experts, as a reference for the introduction of the tour guiding system at the shrine. In addition, this study focuses on user interaction for system development, and under the framework of relevant software development methods, the user guide system is designed to be implemented on the temple site so that the system becomes an important medium for human interaction with the environment, allowing tourists to adopt a self-guided approach to stimulate their experience of traditional culture and add value to the guiding. After two less important and significant indicators were eliminated according to Table 5 of Delphi assessment processes, the requirement of the VR touring system was established. The VR system mainly demonstrated the temple space through interactive guiding and VR technologies. The goal of the system is to design VR-based interaction different from conventional tour guiding methods to help users view the display space from their points of view. The users cannot only control camera view angles but also select the paths and guiding information as if they were actually walking in the temple. Considering the results of the Delphi assessment, we propose the interactive VR touring system should be the next step in design modifications and a basis for future development. This VR touring system is divided into UI framework subsystem, VR guide subsystem, mobile APP subsystem, and. archival subsystem

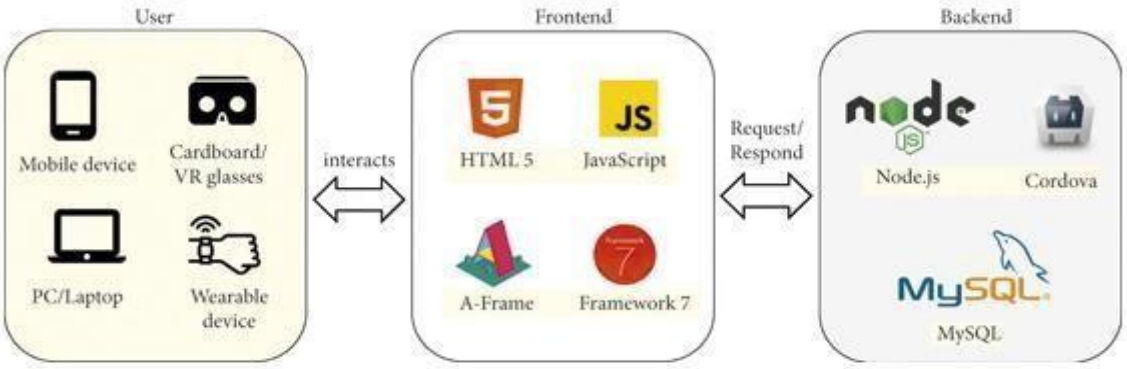

Fig 5.1: Architecture

5.3 System Framework and Architecture

To be able to quickly prototype and evaluate VR touring experience, we focus on the web-based backend system as target application platform to meet the requirements specified in Section 4.1. Smart devices are usually equipped with a camera as well as mobile positioning and wireless Internet access; this study employed these features in a cross-platform VR mobile application with multimedia and LBS capabilities. The system architecture comprises

three major parts: the user, frontend, and backend views, as depicted in Figure 3. Moreover, these multimedia capabilities are supported a broad range of web-based application on many mobile device and not tied to specific wearable device/VR glasses or PC/Laptop. In this study, WebVR [41, 42] was built to present the virtual temple space with interactive guidance and VR technology so that users can browse the exhibition space from their own viewpoint and not only can they control the camera angle but also choose their own browsing path and navigation information, making them feel like they are actually in the scene. Finally, we used the Cordova framework to achieve cross-platform results and to reduce the problems caused by the difference in platforms among users.

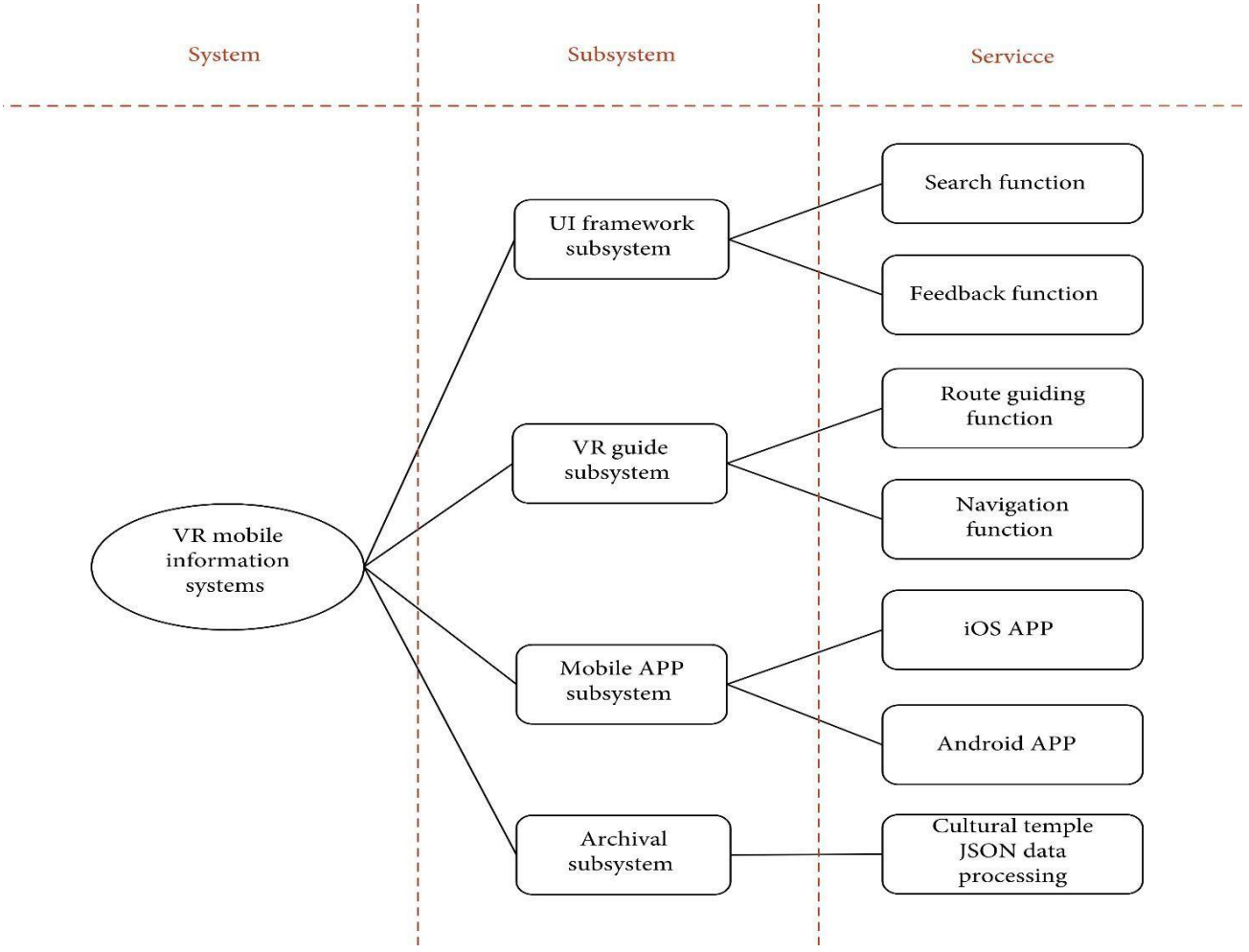

Fig 5.2: VR Framework

5.4 Frontend of System Architecture

A-Frame [43] API is then used to construct WebVR effects. A-Frame is an open-source framework for the Three.js physical component system for VR experiences. Developers can create 3D and WebVR scenes using HTML, while incorporating popular game development

patterns used by engines such as Unity. This technique offers a complete immersive and interactive experience including 360-degree content, interactive effects that support location tracking and control of the device, and cross-platform device usage such as VR glasses head-mounted displays, smartphones, and computer desktops. Furthermore, Primitives [43] in A-Frame Docs features basic geometric shapes (boxes, spheres, cylinders, planes, etc.), Collada models that can be created by importing 3D modelling tools or downloaded from the Internet, a sky that defines the background, and a camera that defines the angle from which the user views the scene, animation, light and shadow, panoramic video, etc. ThroughHTML tags, developers can easily create WebVR scenes. Thus, the VR tour guiding systembuilt using A-Frame enabled the users to view the webpages on smart devices anytime and anywhere. With the immediate display on webpages, the applications of VR become increasingly convenient and improve users' visual experience. Moreover, the websitesystem was presented in conventional text and graphics modes combined with fancy effectscreated using jQuery. JavaScript was used to resolve problems between different browsersto present latest news and the most comfortable viewing experience to users. Social mediawere used to introduce the Ji'an Temple and create a brand on the social media platform toincrease the popularity of the temple. The Facebook fan page of the temple attracts more than 2000 users. The manager can analyze and optimize relevant data through Google Analytics and FB data to evaluate whether posts achieve desired effects.

The frontend of a system architecture is responsible for the visual and interactive aspects of the user interface. It serves as the bridge between the user and the backend system The frontend of a system architecture is the part of the system that users directly interact with. It includes the design of the user interface, navigation, and layout of the application. Frontend is a crucial component that determines the user's experience of the application. Frontend developers use HTML, CSS, and JavaScript to create the user interface. The frontend communicates with the backend to access data and resources. It sends user requests to the server, and receives the server's responses back. Frontend developers need to ensurethat the application is responsive and mobile-friendly. They also need to make sure that theuser interface is accessible to people with disabilities. The frontend can be web-based, mobile-based, or desktop-based. The user interface needs to be consistent across all platforms. The frontend can be developed using various frameworks such as React,Angular, or Vue.js. Frontend frameworks provide tools and libraries for creating user interfaces. The frontend should be optimized for performance and load times. The user interface should be intuitive and easy to navigate. Frontend developers need to ensure that

the application is compatible with different web browsers. They also need to test the application for various screen resolutions. The frontend can include animations and effects to enhance the user experience. The frontend can integrate with other third-party services such as payment gateways, social media platforms, and maps. The frontend should provide feedback to the user about their actions and status of the application. It can include forms for users to enter data and submit requests. The frontend should handle errors and display them to the user in a clear and concise manner. It should include security measures to protect user data and prevent unauthorized access. Frontend developers should adhere to web standards and best practices. They should also follow design principles to ensure a consistent and user-friendly interface. The frontend can use responsive design to adjust to different screen sizes and orientations. The frontend can include localization features to support different languages and regions. It can use cookies and local storage to store user preferences and settings. The frontend can include social sharing buttons to allow users to share content with their friends and followers. The frontend should provide feedback to the user when they complete an action or task. The frontend can include analytics to track user behavior and usage of the application.

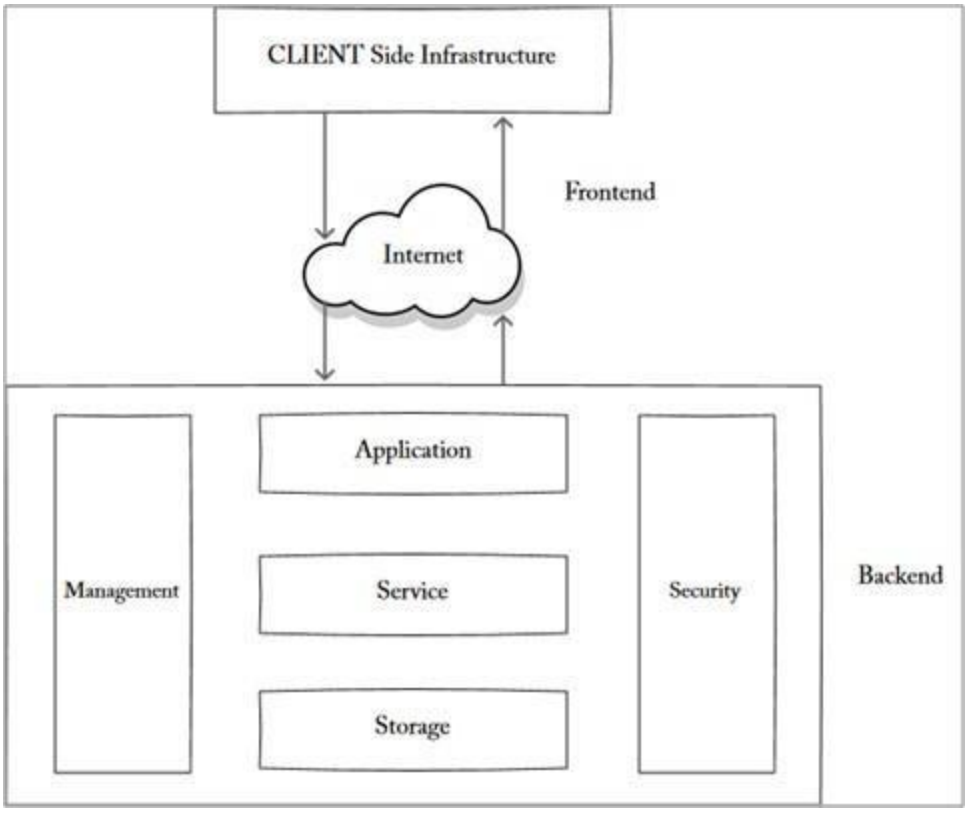

Fig 5.3: Frontend Architecture Top of Form

5.5 Backend of System Architecture

The main computer runs a Node.js server, and the server and its database are first established to provide VR mobile tour services. Relevant service elements are compiled to perform background services by rendering the VR scene with A-Frame. Through such interaction, the user can acquire information about an attraction. In this manner, both modes integrate virtual images into a real-world setting, providing an interactive guided tour to users of the application. The Cordova plugin [44] is used to establish the cross-platform VR mobile tour system's backend data interface, which is connected and synchronized with the server and database. Cordova is an open-source mobile application development framework designed to enable programmers to develop cross-platform mobile applications with web-based application programming interfaces (APIs). It also grants JavaScript access to these interfaces to gain control of system hardware resources (e.g., camera or compass). Because smart devices run on numerous operating systems, Cordova can be used to help programmers ensure that uniform results are achieved across various platforms, thus minimizing the problems users face when changing platforms. Cascading style sheets are used to organize the screen layout and control the background opacity. The final results are transmitted to a browser (HTML format).

The backend of a system architecture is the part that is responsible for processing and storing data. It is the hidden part of a system that users do not see, but it is crucial for the proper functioning of any software application. The backend is responsible for managing data and requests, and it is often the part that communicates with other systems or services.

The backend can be built using a variety of programming languages and technologies, such as Java, Python, Node.js, or Ruby on Rails. The choice of technology depends on the requirements of the application and the skills of the development team.

In a typical system architecture, the backend includes a database that stores all the data of the application. The backend also includes an API (Application Programming Interface) that allows other applications or services to communicate with the system.

The backend is responsible for handling requests from the frontend and processing them. It also manages the security of the application by implementing authentication and authorization mechanisms to ensure that only authorized users have access to the data.

One of the essential aspects of the backend is scalability. The system should be designed to handle a large number of requests and be able to scale horizontally as the user base grows.

The backend can be hosted on-premise or in the cloud, depending on the requirements of the application. Cloud hosting is becoming increasingly popular as it offers better scalability, flexibility, and cost-effectiveness.

Testing and debugging are critical aspects of the backend development process. Developers use various tools and frameworks to test the functionality and performance of the backend and ensure that it is free of bugs and errors.

In summary, the backend is a crucial component of any system architecture that manages the data, processes requests, and provides communication with other systems or services. It is essential to design the backend with scalability, security, and reliability in mind to ensure the smooth functioning of the application

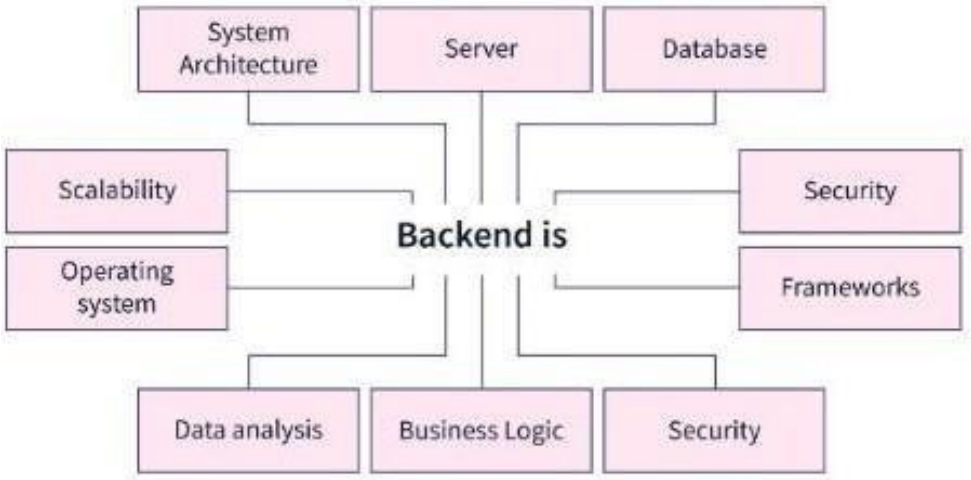

Fig 5.4: Backend Architecture

5.6 Panoramic VR Construction Process

The use of virtual reality devices is becoming more and more popular, and with the increase in demand, developers are more actively betting on this. However, there is currently no standard specification for the service content of virtual reality; therefore, it is difficult for all users to achieve the best experience with the application of virtual reality. When the real-time update of a program is too slow, the screen resolution is too low, or the design does not consider the body feel and the environment, and it may cause discomfort to the user. This research has developed a VR system that can be applied to any device using only a web link. The previous VR devices are expensive, and each VR application usually has its own dedicated device, and the application programs of the devices are not in common with each other. Even if most people are interested in VR, they cannot afford the cost of enjoying VR. The development of WebVR is to solve the current bottleneck of VR promotion. To use WebVR technology, there is no need to learn new programming languages or new VR development software packages from previous VR developers. WebVR allows developers to quickly get started with the VR development model through web languages such as JavaScript and HTML. As in the past, you need to spend a lot of money to buy professional software. A simple web editor can immediately join the developer's team, which greatly reduces the entry barrier for VR development. Furthermore, through the open-source A-Frame framework, VR scenes can be used on mobile phones, PC, Oculus Rift, and HTC Vive. Using this construction method has the following advantages and characteristics: (1) A-Frame can reduce redundant codes. Redundant and complex code has become an obstacle for early adopters. A-Frame reduces the complex and redundant code to one line of HTML code. For example, only one <a-scene> tag is required to create a scene. (2) A-Frame is specially designed for web developers. It is based on DOM, so it can manipulate 3D/VR content like other web applications. Of course, it can also be used in conjunction with JavaScript frameworks such as React; (3) A-Frame makes the code structured. The code of Three.js is usually loose. A-Frame builds a declarative entity-component-system on top of Three.js. In addition, the components can be published and shared so that otherdevelopers can use them in the form of HTML.

Therefore, to provide users with a deeper understanding of the culture and sights of Ji'an Temple, VR display technology was employed in this project, with the aim of superimposing real-life images and data with computer-generated virtual objects to create a complex visual sensory experience and increase users' knowledge of the area. However, to familiarize

users with the local environment, we would design interactive and immersive VR tours with panoramic photos/videos of the area to enable users to learn about the culture and characteristics of the locality through the game and to increase their willingness to participate in the interaction, while the designers were able to add more tourist information to the existing tourist environment, thus increasing the feasibility of navigation. The following describes the steps and research methods required to build a panoramic VR navigation system.

Panoramic VR construction process refers to the use of virtual reality technology to create immersive 360-degree panoramic views of a construction project. This process allows architects, engineers, and project managers to visualize the final product before it is built and make necessary changes to the design, ensuring that the end result meets the expectations of all stakeholders involved.

The process typically starts with the creation of a 3D model of the construction project using computer-aided design (CAD) software. The 3D model is then imported into a virtual reality platform, where the panoramic VR environment is created.

In order to create the panoramic VR environment, a series of high-resolution photographs are taken of the construction site using specialized equipment. These photographs are then stitched together using software to create a seamless 360-degree panoramic view of the site.

Once the panoramic VR environment is created, stakeholders can use virtual reality headsets to immerse themselves in the environment and explore the construction site from every angle. This allows them to identify any design flaws or issues with the project and make necessary adjustments before construction begins.

In addition to identifying design flaws, the panoramic VR environment can also be used to showcase the project to potential investors or clients. They can use the virtual reality headset to experience the project in a fully immersive way, which can help them make more informed decisions about the project.

Another benefit of using the panoramic VR construction process is that it can help to streamline the construction process. By identifying design flaws and making necessary

adjustments before construction begins, the project can be completed more efficiently, reducing the time and cost required to complete the project.

Overall, the panoramic VR construction process is a powerful tool for architects, engineers, project managers, and clients alike. It allows them to visualize the project in a fully immersive way, identify design flaws, and make necessary adjustments before construction begins,

5.7 System Demonstration

The VR tour guiding system built using A-Frame enabled the users to view WebVR on smart devices anytime and anywhere. With the immediate display on webpages, the applications of VR became increasingly convenient and improve users' visual experience. The website was presented in conventional text and graphics modes combined with fancy effects created using jQuery. JavaScript was used to resolve problems between different browsers to present latest news and the most comfortable viewing experience to users. A-Frame was used to create a VR system. In the VR system of Ji'an Temple tour guiding, a user can see a trigger spot in the center of the monitor (Figure 6). Users can swipe the screen of cell phone or move their cell phone to select a position they want to go. Clicking a position can trigger corresponding locations. Figure 7 demonstrates that films containing information of relevant cultural relics are available and audio guiding that can be played by clicking the play button below. In addition, social media are used to introduce Ji'an Temple and create a brand on the social media platform to increase the popularity of the temple. The managerof the fan page sometimes plan and design graphics and text contents of posts, and he canalso analyze and optimize relevant data through Google Analytics and FB data to evaluate whether posts achieve desired effects. Finally, the display of operation of VR headset glass.

System demonstration is a crucial step in the development of any application, including the temple detail app. This process involves showcasing the various features and functionalities of the app to the end-users or stakeholders.

In the case of the temple detail app, system demonstration would involve highlighting the different aspects of the temple such as its history, architecture, and cultural significance. The app could also include features such as virtual tours, multimedia presentations, and interactive maps.

During the demonstration, the app's user interface, navigation, and search functionalities will be showcased to ensure that they are user-friendly and intuitive. Any bugs or issues will be identified and addressed during this phase to ensure that the app is stable and reliable.

System demonstration also provides an opportunity for user feedback, allowing developers to make necessary adjustments and improvements before the app is released. Additionally, it helps to ensure that the app meets the expectations of the target audience .

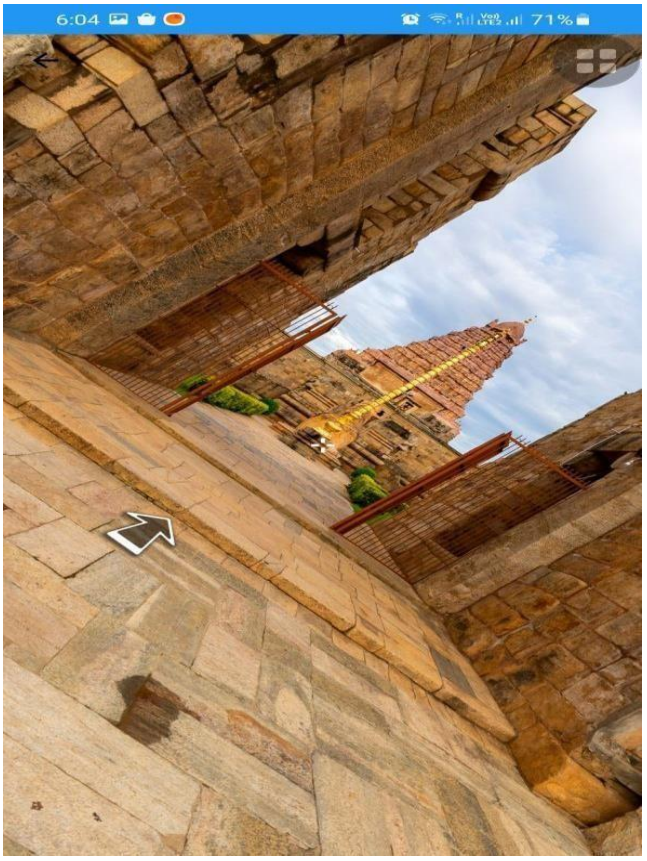

Fig 5.5: VR Image 1

Fig 5.6: VR Image 2

CHAPTER 6
RESULTS AND DISCUSSION

To understand the user's satisfaction with the usage of the VR touring system, we employed the Questionnaire for User Interaction Satisfaction (QUIS) [45] to conduct a quantitative study. The survey respondents are mainly temple officials, pilgrims, and Internet citizens. Moreover, the main focus was on answering representative questions with adequate satisfaction and helpfulness. The questions were answered by users following their action learning using the VR touring system. The questionnaire had four dimensions: (1) overall reaction to the VR touring system; (2) display of the VR touring system; (3) contents of the VR touring system; and, (4) usage of the VR touring system. The questionnaire is divided into these four parts and contains 18 questions. Among them, the users were asked to rate the importance and feasibility of each indicator according to a 6-point Likert scale, with anchors of 1 (strongly disagree) and 6 (strongly agree) [32]. The aim was to obtain a general understanding of the satisfaction of each user, which could provide evidence and a foundation for data analyses. From Table 6, the mean values of the four dimensions revealed that the usage of the VR touring system as favorable (4.72); however, their overallsatisfaction toward the tour guiding display was slightly lower (4.53). In a further analysis ofvarious items, the median value of 3.5 was used for a 6-point Likert scale. The mean valuesof 18 items were higher than 3.5, the median value, suggesting that the users generally considered the VR touring system to be satisfactory. The mean values of the first item "I think the VR touring system is (undesirable/excellent)" and the second item "I think the VR touring system is (difficult to use/easy to use)" were close to 5 points, indicating that the proposed system was easy to operate and excellent in quality. However, the mean values of the sixth item "I think the VR touring system is (dull/lively)" and the ninth item "The resolution clarity of the screen is (blurred/clear)" were 4.00 and 4.17, respectively, that is, the sixth item and the ninth item are the two poorer satisfactions. These results revealed that this system is generally satisfactory and easy to operate, but relatively uninteresting.

The system evaluation was divided into two stages: expert assessment and target user usability test. In the first stage, 10 experts of relevant domains and objective perspectives were invited to provide their opinions through the Delphi questionnaire surveys. Through literature review, we summarized three major dimensions and nine indicators for the experts to evaluate. Subsequently, based on the experts' opinions, two indicators (reminder function and smart terminal management) were removed. VR tour guiding was established

thereafter. In the second stage, users, including students, Internet users, and pilgrims, were invited. VR tour guiding, based on the integrated outcomes of the Delphi expert questionnaires, was provided to these participants, and the usability of the system was tested. QUIS was employed to analyze the users' satisfaction to the tour guiding system; the satisfaction analysis comprised four main axes: the overall reaction, tour guiding display, tour guiding content, and tour guiding operation. The developed system was rated by the target users through the QUIS for its usability.

This study analyzed the overall reaction to the tour-guiding system, display, content, and operation. The analysis results revealed that, in general, the users perceived VR tour guiding to be convenient and easy to use. The tour guiding system's display and content presented clear information to the users, aiding them in gaining further understanding of the introduced item. Statistical analysis results of the expert and user questionnaires revealed that interactive VR was more efficient in communicating information to users than conventional text and graphics webpages. Because interactive VR tour guiding was incorporated into the proposed system, the interaction between the users and objects increased the users' concentration as well as information communication efficiency.

Through this combination, a revolutionary method of tour guiding was developed. Conventional graphics and text interpretation can no longer satisfy the needs of the general public. Additional information technologies must be integrated with tour guiding to attract user attention by adding diverse options to interactive VR tour guiding systems. The easy-to-operate and convenient systems can provide unprecedented online browsing experience to users or customers of businesses and subsequently strengthen customers' attachment to businesses effectively.

This is an android application that provides pilgrims visiting Kumbakonam with essential details about the temples, hotels, and cabs in the area. The app offers a comprehensive database that includes the details, history, and location of the temple, as well as hotel and cab services. The app was developed due to the difficulty in finding the precise location and details of some places on Google Maps. This paper highlights the importance of mobile app development and discusses the various front-end development tools and back-end servers used in creating such apps. Additionally, the paper discusses mobile app testing and the different tools used to conduct performance, security, and usability testing.

Mobile app development has become increasingly important in recent years, and this application is a perfect example of its importance. The app provides an intuitive user interface that is designed to enable easy device interaction while accounting for mobility constraints and context-specific features. The app's interface is built to be user-friendly and understandable, making it easy for users to navigate.

The development of the app involved the use of various front-end development tools like JavaScript, CSS/HTML editors such as Angular or React frameworks, prototyping utilities like Figma & Sketch, and Selenium or Cypress testing platforms. These tools significantly aid developers by improving the code writing quality while enhancing overall user experience. Regular updates are necessary to keep these tools compatible with current programming languages and latest tech advancements.

The app also utilizes back-end servers, which are geographically separate from the front-facing parts like user interfaces or portable applications. The back-end servers are designed to engage data manipulation, archiving, and recovery. The servers are optimized to ensure scaling capability, reliability, and security standards through optimal design optimization techniques. The app's security is ensured through continuous assessment updates towards maintenance management by independently managed cloud service providers specialized teams.

Mobile app testing is an essential part of software development as it provides a guarantee that users receive top-quality apps with optimum performance levels. The testing process involves several steps, including test planning, test environment setup, manual testing, automated testing, performance testing, security testing, usability testing, and regression testing. Tools used for mobile app testing include Appium, Xamarin Test Cloud, and several others.

In conclusion, this app provides an excellent example of how mobile app development can be used to enhance user experience and meet user needs. The app is designed to be user-friendly and intuitive, providing essential details about temples, hotels, and cabs in the Kumbakonam area. The app's development involved the use of various front-end development tools and back-end servers, which are optimized to ensure scaling capability, reliability, and security standards. Finally, mobile app testing is an essential part of software development, and various tools are used to ensure that users receive top-quality apps with optimum performance levels.

CHAPTER 7

CONCLUSION

This project has been developed to make the pilgrim’s work easy to find the location of the temple and pre plan the trip. The app has been designed with the user in mind, making it easy to navigate and providing clear and concise information about the different temples, hotels, and cabs available in Kumbakonam. It has also incorporated filtering algorithms, which have been instrumental in ensuring that only relevant information is displayed to the user, thereby enhancing the user experience. And, it has also incorporated VR & AR, which helps the user in taking up a virtual tour of a temple. the emergence of this android app that offers intricate descriptions regarding holy sites, lodgings and taxis in Kumbakonam has unlocked fresh avenues for both devout and leisurely tourists. The dearth of a comprehensive application furnishing all-encompassing details pertaining to the historical background, location as well as photographs concerning temples, hotels and cabs has been remedied by means of this user-friendly program which caters to everybody's needs without any complications. Employing advanced technology relevant to mobile applications development is crucial when addressing issues related with varying screen sizes or specifications associated with different portable devices. The development of this mobile application has not only provided a platform for spiritual and leisure travellers to access information about temples, hotels, and cabs in and around Kumbakonam but has also created new opportunities for mobile app developers. The increasing demand for mobile app developers, especially those with expertise in mobile app development and testing, hasbeen on the rise, with the mobile app economy projected to grow even further.

Summing up, the emergence of this android app that offers intricate descriptions regarding holy sites, lodgings and taxis in Kumbakonam has unlocked fresh avenues for both devout and leisurely tourists. The dearth of a comprehensive application furnishing all-encompassing details pertaining to the historical background, location as well as photographs concerning temples, hotels and cabs has been remedied by means of this user-friendly program which caters to everybody's needs without any complications. Employing advanced technology relevant to mobile applications development is crucial when addressing issues related with varying screen sizes or specifications associated with different portable devices." The app has been designed withthe user in mind, making it easy to navigate and providing clear and concise information about the different temples, hotels, and cabs available in Kumbakonam. It has

also incorporated filtering algorithms, which have been instrumental in ensuring that only relevant information is displayed to the user, thereby enhancing the user experience. And, it has also incorporated VR & AR, which helps the user in takingup a virtual tour of a temple. The development of this mobile application has not only provided a platform for spiritual and leisure travellers to access information about temples, hotels, and cabs in and around Kumbakonam but has also created new opportunities for mobile app developers. The increasing demand for mobile app developers,especially those with expertise in mobile app development and testing, has beenon the rise, with the mobile app economy projected to grow even further.To sum up, the creation of this mobile app has fulfilled a market demand and showcased the capabilities of mobile app development to tackle diverse obstacles and cater to various sectors. It has opened up new opportunities for mobile app developers and has provided a platform for spiritual and leisure travellers to access information about temples, hotels, and cabs in and around Kumbakonam

7.1 Limitations

There is still room for improvement in this research in the future. First of all, our target sample is limited to the case of Temple in Tamilnadu. It did not take into account the technological and cultural changes between different countries, so a limitation with our chosen method was that we were unable to make any detailed comparisons between application performance and user experience with other methods. Only QUIS research can be conducted. Furthermore, this research uses a panoramic image method to implement a VR navigation system. Although it has a three-dimensional effect, the spherical virtual image will form an obvious intersection point stitching problem directly above and directly below the space. In the future, it is hoped that the problem of the intersection of the spheres can be improved without affecting the three-dimensional effect. In addition, at present, the concept of simulating the horizontal distance between the eyes is used to draw the scene horizontally. If you turn your head in other directions to watch, it will be visually distorted and the images will not be able to merge. In the future, further discussions can be made in this direction, which is expected to reduce the dizziness. Finally, the future application of VR combined with imagination can develop infinite possibilities; in addition to the existing visual and auditory senses, humans still have touch, smell, taste, and various other senses so that users can have a more immersive experience in the virtual world. Integrating these perceptions in the future will be one of the important directions. Therefore, including how to

simulate various perceptions, how to combine, transmit, and synchronize various sensory signals, etc., are all important topics; in addition, new applications developed by VR, such as how to remotely control through VR and how to provide further 360° panoramic video services with lower latency will also drive the evolution and development of various new technologies.

7.2 Future works

In this project, I will develop a mobile application that provides detailed information about temples in Tamil Nadu, along with VR support. The app will help tourists and devotees explore and learn more about the rich cultural and religious heritage of Tamil Nadu. Here are 50 potential future work items for this project: Develop a comprehensive database of all temples in Tamil Nadu, including their location, history, architecture, and significance. Add GPS functionality to the app, so that users can easily locate temples and navigate to them. Integrate VR technology into the app, so that users can virtually explore the temples and experience the architecture and atmosphere. Use 360-degree video and audio to create an immersive experience for users, allowing them to feel like they are really inside the temple. Develop a feature that allows users to take virtual tours of temples, guiding them through the different parts of the temple and explaining their significance. Allow users to search for temples by name, location, or category (such as Shaivite or Vaishnavite temples). Add a social media component to the app, allowing users to share their experiences and photos of the temples with their friends and family. Develop a feature that allows users to book guided tours of temples through the app. Offer users the ability to purchase puja items andprasad through the app, which can be delivered to them or offered at the temple. Create a feature that allows users to donate to temples and charitable organizations through the app.Develop an augmented reality feature that allows users to view information about a temple simply by pointing their phone camera at it. Use machine learning algorithms to analyze user behavior and preferences, and offer personalized recommendations for temples to visit.Allow users to rate and review temples, which can be used to generate rankings and recommendations for other users. Offer users the ability to create their own custom tours oftemples, based on their preferences and interests. Develop a feature that allows users to track their progress as they visit different temples, earning rewards and badges for completing certain milestones. Offer users the ability to book accommodations near the temples, such as hotels or homestays. Develop a feature that allows users to hire local guides or translators for their temple visits. Add a feature that allows users to learn about

the festivals and events that take place at each temple throughout the year. Offer users the ability to purchase souvenirs and handicrafts from the temple gift shops through the app. Develop a feature that allows users to view live streaming of temple rituals and ceremonies. Create a feature that allows users to chat with other users who are visiting the same temple, or who have similar interests. Offer users the ability to participate in online discussions and forums about different temples and religious traditions. Develop a feature that allows users to share their favorite temples and routes with their friends, creating a social network of temple enthusiasts. Use data analytics to identify patterns and trends in user behavior, which can be used to improve the app's functionality and user experience. Develop a feature that allows users to create and share their own virtual tours of temples, which can be accessed by other users. Offer users the ability to book transportation to and from the temples, such as taxis or buses. Create a feature that allows users to learn about the history and significance of each temple, as well as the stories and legends associated with them. Use natural language processing to create a chatbot that can answer users' questions about the temples and provide personalized recommendations. Develop a feature that allows users to view 3D models of the temples, which can be rotated and explored

.

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APPENDIX

A. Source Code:

Main Code:

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.kovilnagaram.kovilnagaram">

    <uses-permission android:name="android.permission.INTERNET" />

    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/Theme.KovilNagaram">
        <activity
            android:name=".NavagrahaActivity"
            android:exported="false" />
        <activity
            android:name=".EntertainmentListActivity"
            android:exported="false" />
        <activity
            android:name=".HotelActivity"
            android:exported="false" />
        <activity
            android:name=".EntertainmentActivity"
            android:exported="false" />
        <activity
            android:name=".CapActivity"
            android:exported="false" />
        <activity
```

```
        android:name=".TempleActivity"
        android:exported="false" />
    <activity
        android:name=".ListActivity"
        android:exported="false" />
    <activity
        android:name=".HotelListActivity"
        android:exported="false" />
    <activity
        android:name=".DashboardActivity"
        android:exported="false" />
    <activity
        android:name=".VirtualActivity"
        android:exported="false"/>
    <activity
        android:name=".WelcomeActivity"
        android:exported="true">
        <intent-filter>
            <action android:name="android.intent.action.MAIN" />
            <action android:name="android.intent.action.VIEW" />

            <category android:name="android.intent.category.DEFAULT" />
            <category android:name="android.intent.category.LAUNCHER" />
        </intent-filter>
    </activity>
</application>
```

Module 1:

```
package com.kovilnagaram.kovilnagaram;
import androidx.appcompat.app.AppCompatActivity;
import android.content.Intent;
import android.net.Uri;
import android.os.Bundle;
```

```
import android.view.View;
import android.widget.ImageView;
import android.widget.TextView;


import org.json.JSONException;
import org.json.JSONObject;

public class CapActivity extends AppCompatActivity {
    ImageView imBack,imCall;
    TextView txName,txAddress,txContact,txWebsite;
    JSONObject jsonObject;
    String latitude="",longitude="",contact="",websiteURL="";
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_cap);
        init();
        GetSetData();

        imBack.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                finish();
            }
        });

        imCall.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                Intent intent = new Intent(Intent.ACTION_DIAL);
                intent.setData(Uri.parse("tel:"+contact));
                startActivity(intent);
            }
```

```
        });
        txWebsite.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                Intent browserIntent = new Intent(Intent.ACTION_VIEW,
Uri.parse(websiteURL));
                startActivity(browserIntent);
            }
        });
    }
    //Variable initialization
    public void init() {
        imBack= findViewById(R.id.im_back);
        imCall=  findViewById(R.id.im_call);
        txName = findViewById(R.id.tx_name);
        txAddress = findViewById(R.id.tx_address);
        txContact = findViewById(R.id.tx_contact);
        txWebsite= findViewById(R.id.tx_Website);
    }
    //Get detail from json
    public void GetSetData() {
        try {
            jsonObject = new JSONObject(getIntent().getStringExtra("Detail"));
            txName.setText(jsonObject.getString("name"));
            txAddress.setText(jsonObject.getString("address"));
            txContact.setText(jsonObject.getString("contact"));
            contact=jsonObject.getString("contact");
            latitude=jsonObject.getString("latitude");
            longitude=jsonObject.getString("longitude");
            websiteURL=jsonObject.getString("website");
        } catch (JSONException e) {
            e.printStackTrace();
        }
    }
```

```
}
```

Module 2:

```
package com.kovilnagaram.kovilnagaram;

import androidx.appcompat.app.AppCompatActivity;
import androidx.recyclerview.widget.DefaultItemAnimator;
import androidx.recyclerview.widget.LinearLayoutManager;
import androidx.recyclerview.widget.RecyclerView;

import  android.content.Intent;
import android.os.AsyncTask;
import android.os.Bundle;

import com.kovilnagaram.kovilnagaram.adapter.DashboardAdapter;

import org.json.JSONArray;
import org.json.JSONException;
import org.json.JSONObject;

import java.io.IOException;
import java.io.InputStream;
import java.io.UnsupportedEncodingException;
import java.util.ArrayList;

public class DashboardActivity extends AppCompatActivity {
    DashboardAdapter dashboardAdapter;
    ArrayList<JSONObject> dashboardData = new ArrayList<>();
    RecyclerView recycleDashboard;
    JSONArray jsonArray;
```

```
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_dashboard);

        init();
        setAdapters();
        new DashboardListAsy().execute();

        dashboardAdapter.setOnClick(new DashboardAdapter.OnItemClick() {
            @Override
            public void onItemClick(int position) {
                Intent intent;
                Bundle bundle = new Bundle();
                try {
                    jsonArray=new
JSONArray(dashboardData.get(position).get("list").toString());
                    if(position==1){
                        intent = new Intent(DashboardActivity.this,
HotelListActivity.class);

bundle.putString("HotelData",dashboardData.get(position).toString());

bundle.putString("Title",dashboardData.get(position).get("name").toString());

bundle.putString("Image",dashboardData.get(position).get("image").toString());
                        intent.putExtras(bundle);
                        startActivity(intent);
                    }else if(position==3){
                        intent = new Intent(DashboardActivity.this,
EntertainmentListActivity.class);
                        bundle.putString("ListData",jsonArray.toString());

bundle.putString("Title",dashboardData.get(position).get("name").toString());
```

```
bundle.putString("Image",dashboardData.get(position).get("image").toString());
                    intent.putExtras(bundle);
                    startActivity(intent);
                }else if(position==5 || position==6){
                    intent = new Intent(DashboardActivity.this, VirtualActivity.class);

bundle.putString("VRUrl",dashboardData.get(position).get("url").toString());
                    intent.putExtras(bundle);
                    startActivity(intent);
                } else{
                    intent = new Intent(DashboardActivity.this, ListActivity.class);
                    bundle.putString("ListData",jsonArray.toString());

bundle.putString("Title",dashboardData.get(position).get("name").toString());

bundle.putString("Image",dashboardData.get(position).get("image").toString());
                    intent.putExtras(bundle);
                    startActivity(intent);
                }
            } catch (JSONException e) {
                e.printStackTrace();
            }
        }
    });
}
//Variable initialization
public void init() {
    recycleDashboard = findViewById(R.id.recycle_dashboard);
}

//Set Adapter for  list
public void setAdapters() {
    dashboardAdapter = new DashboardAdapter(dashboardData, this);
```

```
        recycleDashboard.setItemAnimator(new DefaultItemAnimator());
        recycleDashboard.setLayoutManager(new LinearLayoutManager(this,
LinearLayoutManager.VERTICAL, false));
        recycleDashboard.setAdapter(dashboardAdapter);
    }

    //Get value from local json
    class DashboardListAsy extends AsyncTask<String, Void,
ArrayList<JSONObject>> {
        @Override
        protected void onPreExecute() {
            super.onPreExecute();
            dashboardData.clear();
        }

        @Override
        protected ArrayList<JSONObject> doInBackground(String... params) {
            String json;
            try {
                InputStream is = getAssets().open("dashboard.json");
                int size = is.available();
                byte[] buffer = new byte[size];
                is.read(buffer);
                is.close();
                json = new String(buffer, "UTF-8");

                JSONObject obj = new JSONObject(json);
                JSONArray jsonArray = obj.getJSONArray("dashboard");

                for (int i = 0; i < jsonArray.length(); i++) {
                    JSONObject jsonObject2 = jsonArray.getJSONObject(i);
                    dashboardData.add(jsonObject2);
                }
            } catch (JSONException e) {
```

```
            e.printStackTrace();
        } catch (UnsupportedEncodingException e) {
            e.printStackTrace();
        } catch (IOException e) {
            e.printStackTrace();
        }
        return dashboardData;
    }

    @Override
    protected void onPostExecute(final ArrayList<JSONObject> list) {
        super.onPostExecute(list);
        dashboardAdapter.notifyDataSetChanged();
    }
  }
}
```

Module 3:

```
package com.kovilnagaram.kovilnagaram;

import androidx.appcompat.app.AppCompatActivity;

import android.content.Intent;
import android.net.Uri;
import android.os.Bundle;
import android.view.View;
import android.widget.ImageView;
import android.widget.LinearLayout;
import android.widget.TextView;

import com.google.android.material.floatingactionbutton.FloatingActionButton;

import org.json.JSONException;
```

```
import org.json.JSONObject;

public class EntertainmentActivity extends AppCompatActivity {
    ImageView imBack,imCall;
    TextView txName, txContact, txWebsite,txAvailable;
    LinearLayout lyContact, lyBooking,lyAvailable;
    JSONObject jsonObject;
    FloatingActionButton fbLocation;
    String latitude = "", longitude = "",location="",contact="",websiteURL="";

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_entertainment);

        init();
        GetSetData();

        imBack.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                finish();
            }
        });
        fbLocation.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {

                String strUri = "http://maps.google.com/maps?q=loc:" + latitude + "," +
longitude;
                Intent intent = new Intent(android.content.Intent.ACTION_VIEW,
Uri.parse(strUri));
                intent.setClassName("com.google.android.apps.maps",
"com.google.android.maps.MapsActivity");
```

```
            startActivity(intent);
        }
    });
    txWebsite.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {
            Intent browserIntent = new Intent(Intent.ACTION_VIEW,
Uri.parse(websiteURL));
            startActivity(browserIntent);
        }
    });
    imCall.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {
            Intent intent = new Intent(Intent.ACTION_DIAL);
            intent.setData(Uri.parse("tel:"+contact));
            startActivity(intent);
        }
    });
}

//variable initialization
public void init() {
    imBack = findViewById(R.id.im_back);
    imCall = findViewById(R.id.im_call);
    txName = findViewById(R.id.tx_name);
    txWebsite = findViewById(R.id.tx_Website);
    txContact = findViewById(R.id.tx_contact);
    txAvailable= findViewById(R.id.tx_available);
    fbLocation = findViewById(R.id.fb_location);
    lyContact = findViewById(R.id.ly_contact);
    lyBooking = findViewById(R.id.ly_booking);
    lyAvailable= findViewById(R.id.ly_available);
}
```

```
//set value to variable from previous screen
public void GetSetData() {
    try {
        jsonObject = new JSONObject(getIntent().getStringExtra("Detail"));
        txName.setText(jsonObject.getString("name"));
        txContact.setText(jsonObject.getString("contact"));
        contact=jsonObject.getString("contact");
        websiteURL=jsonObject.getString("website");
        location=jsonObject.getString("location");
        if (jsonObject.getString("location").isEmpty()) {
            fbLocation.setVisibility(View.INVISIBLE);
        } else {
            latitude = jsonObject.getString("latitude");
            longitude = jsonObject.getString("longitude");
        }
        if (jsonObject.getInt("booking") == 0) {
            lyBooking.setVisibility(View.GONE);
            lyContact.setVisibility(View.VISIBLE);
        } else {
            lyBooking.setVisibility(View.VISIBLE);
            lyContact.setVisibility(View.GONE);
        }
        if (jsonObject.getInt("booking") == 2) {
            lyAvailable.setVisibility(View.VISIBLE);
            lyBooking.setVisibility(View.GONE);
            lyContact.setVisibility(View.GONE);
            txAvailable.setText(jsonObject.getString("contact"));
        } else {
            lyAvailable.setVisibility(View.GONE);
        }
    } catch (JSONException e) {
        e.printStackTrace();
    }
```

```
    }
}
```

Module 4:

```
package com.kovilnagaram.kovilnagaram;

import androidx.appcompat.app.AppCompatActivity;
import androidx.recyclerview.widget.DefaultItemAnimator;
import androidx.recyclerview.widget.GridLayoutManager;
import androidx.recyclerview.widget.RecyclerView;

import android.content.Intent;
import android.content.res.Resources;
import android.graphics.Bitmap;
import android.graphics.BitmapFactory;
import android.os.Bundle;
import android.view.View;
import android.widget.ImageView;
import android.widget.TextView;

import com.kovilnagaram.kovilnagaram.adapter.EntertainmentListAdapter;

import org.json.JSONArray;
import org.json.JSONException;
import org.json.JSONObject;

import java.util.ArrayList;

public class EntertainmentListActivity extends AppCompatActivity {
    EntertainmentListAdapter listAdapter;
    ArrayList<JSONObject> dataList = new ArrayList<>();
    RecyclerView recycleList;
    ImageView imBack,imTitle;
```

```
    TextView txTitle;
    JSONArray jsonArray;
    int indexPosition=0;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_entertainment_list);
        init();
        setAdapters();
        GetSetData();

        listAdapter.setOnClick(new EntertainmentListAdapter.OnItemClick(){
            @Override
            public void onItemClick(int position) {
                try {
                    jsonArray=new
JSONArray(dataList.get(position).get("list").toString());
                    Intent intent = new Intent(EntertainmentListActivity.this,
ListActivity.class);
                    Bundle bundle = new Bundle();
                    bundle.putInt("Position",3);
                    bundle.putString("ListData",jsonArray.toString());

bundle.putString("Title",dataList.get(position).get("name").toString());

bundle.putString("Image",dataList.get(position).get("image").toString());
                    intent.putExtras(bundle);
                    startActivity(intent);
                } catch (JSONException e) {
                    e.printStackTrace();
                }
            }
        });
        imBack.setOnClickListener(new View.OnClickListener() {
```

```
        @Override
        public void onClick(View view) {
            finish();
        }
    });
}

//variable initialization
public void init() {
    recycleList = findViewById(R.id.recycle_temple);
    imBack = findViewById(R.id.image_back);
    imTitle = findViewById(R.id.im_title);
    txTitle= findViewById(R.id.tx_title);
}

//Set Adapter for  list
public void setAdapters() {
    listAdapter = new EntertainmentListAdapter(dataList, this);
    recycleList.setItemAnimator(new DefaultItemAnimator());
    recycleList.setLayoutManager(new GridLayoutManager(this, 2));
    recycleList.setAdapter(listAdapter);
}
//Set values to variable from previous screen
public void GetSetData() {
    Resources resources = getResources();
    try {
        Bundle bundle = getIntent().getExtras();
        String Array=bundle.getString("ListData");
        indexPosition=bundle.getInt("Position");
        jsonArray=new JSONArray(Array);
        for (int i = 0; i < jsonArray.length(); i++) {
            JSONObject jsonObject = jsonArray.getJSONObject(i);
            dataList.add(jsonObject);
        }
```

```
            String title = bundle.getString("Title");
            txTitle.setText(title);
            String imageName = bundle.getString("Image");
            final int resourceId = resources.getIdentifier(imageName, "drawable",
getPackageName());
            Bitmap bitmap = BitmapFactory.decodeResource(getResources(),
resourceId);
            imTitle.setImageBitmap(bitmap);
        } catch (JSONException e) {
            e.printStackTrace();
        }
    }

}
```

Module 5:

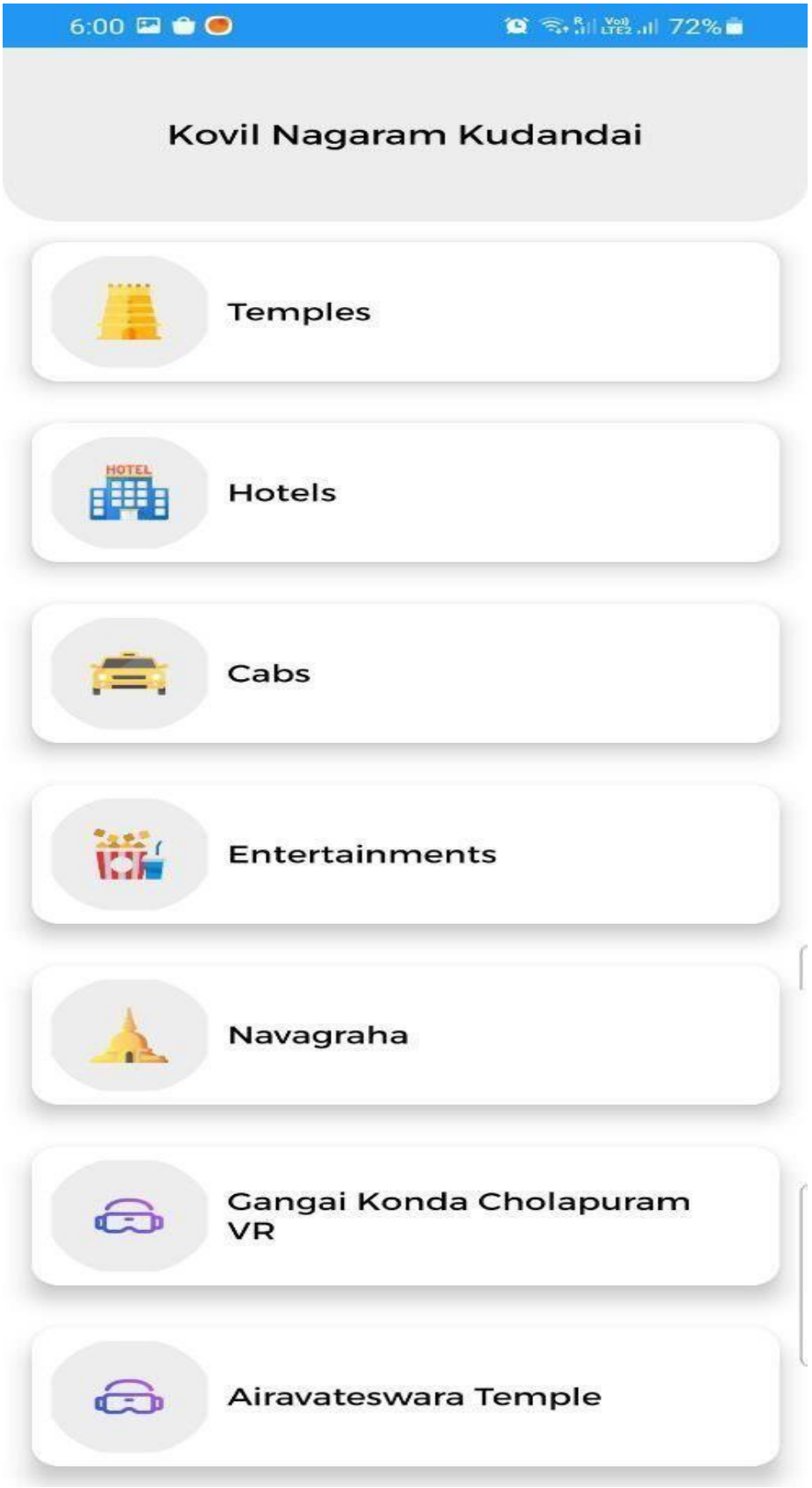
```
package com.kovilnagaram.kovilnagaram;

import androidx.appcompat.app.AppCompatActivity;
import androidx.appcompat.widget.Toolbar;
import android.content.Intent;
import android.content.res.Resources;
import android.graphics.Bitmap;
import android.graphics.BitmapFactory;
import android.net.Uri;
import android.os.Bundle;
import android.view.View;
import android.widget.ImageView;
import android.widget.TextView;

import com.google.android.material.floatingactionbutton.FloatingActionButton;

import org.json.JSONException;
```

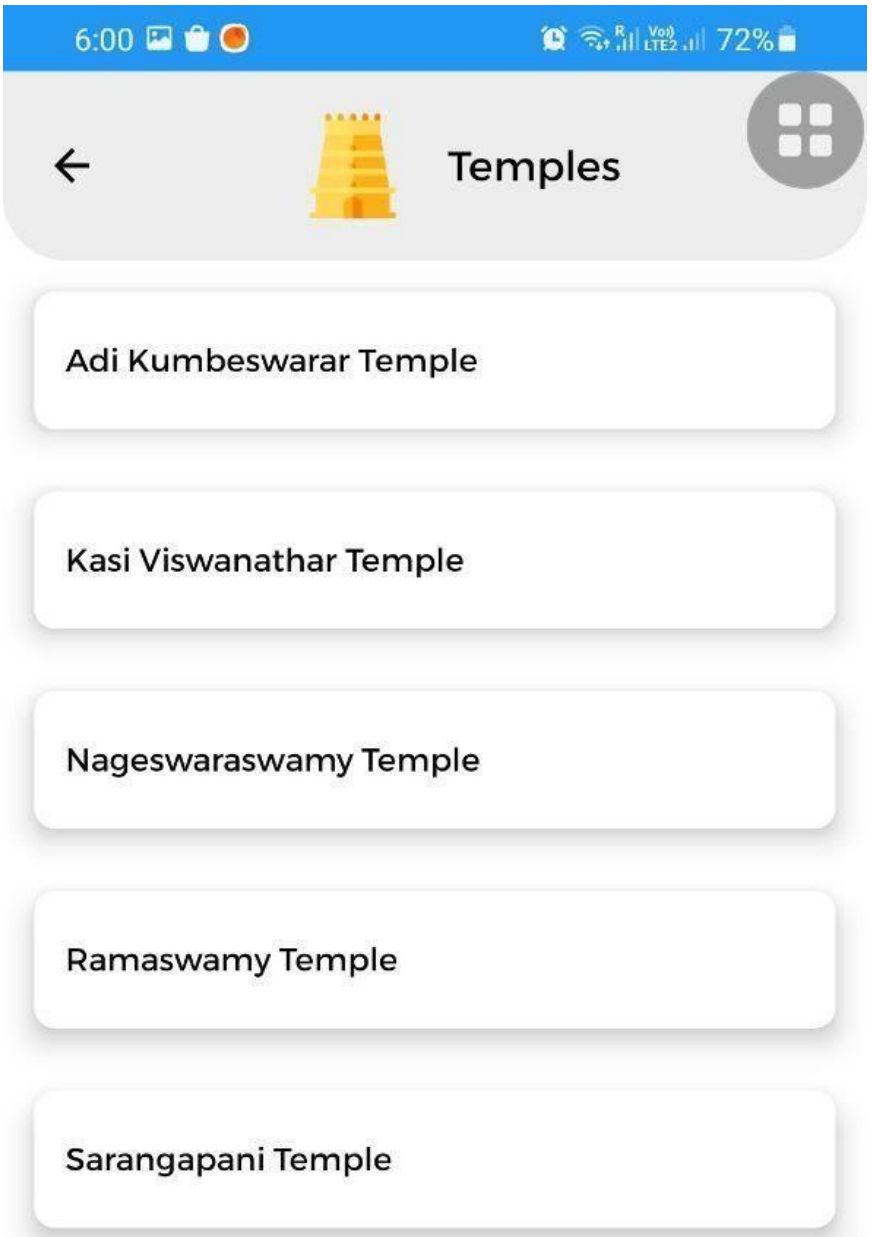
```
import org.json.JSONObject;

public class HotelActivity extends AppCompatActivity {
    ImageView imImage,imBack,imCall;
    TextView txName,txDescription,txAddress,txContact;
    JSONObject jsonObject;
    Toolbar toolbar;
    FloatingActionButton fbLocation;
    String latitude="",longitude="",contact="";
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_hotel);
        init();
        GetSetData();

        imBack.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                finish();
            }
        });
        fbLocation.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                String strUri = "http://maps.google.com/maps?q=loc:" + latitude + "," +
longitude;
                Intent intent = new Intent(android.content.Intent.ACTION_VIEW,
Uri.parse(strUri));
                intent.setClassName("com.google.android.apps.maps",
"com.google.android.maps.MapsActivity");
                startActivity(intent);

            }
```

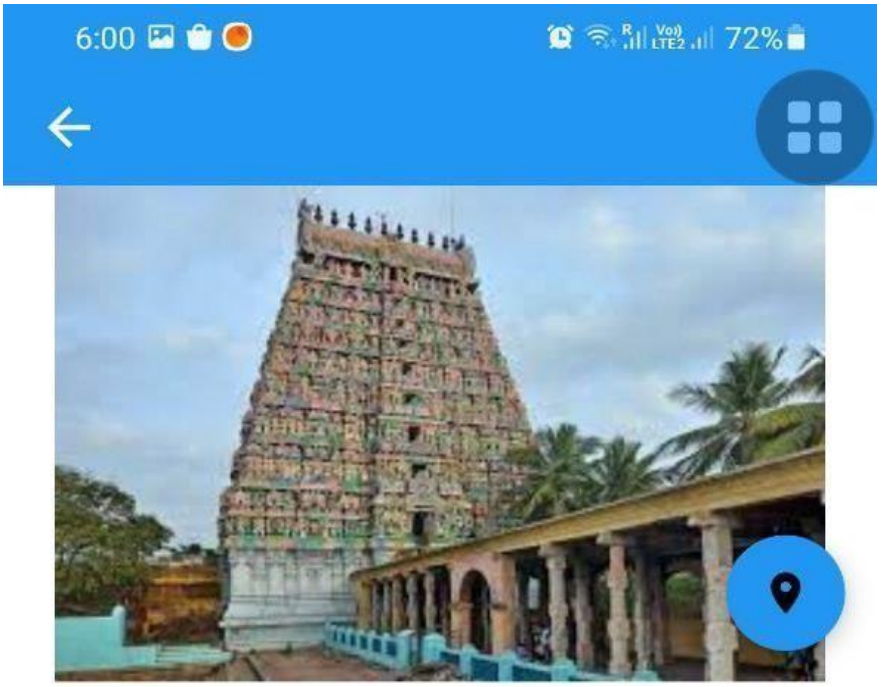
```
    });
    imCall.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {
            Intent intent = new Intent(Intent.ACTION_DIAL);
            intent.setData(Uri.parse("tel:"+contact));
            startActivity(intent);
        }
    });
}
//variable initialization
public void init() {
    imImage= findViewById(R.id.im_image);
    imBack= findViewById(R.id.im_back);
    imCall= findViewById(R.id.im_call);
    txName = findViewById(R.id.tx_name);
    txDescription = findViewById(R.id.tx_description);
    txAddress = findViewById(R.id.tx_address);
    txContact  = findViewById(R.id.tx_contact);
    toolbar =  findViewById(R.id.toolbar);
    fbLocation=  findViewById(R.id.fb_location);
}
//Set value to variable from json
public void GetSetData() {
    Resources resources = getResources();
    try {
        jsonObject = new JSONObject(getIntent().getStringExtra("Detail"));
        txName.setText(jsonObject.getString("name"));
        txDescription.setText(jsonObject.getString("description"));
        txAddress.setText(jsonObject.getString("address"));
        txContact.setText(jsonObject.getString("contact"));
        contact=jsonObject.getString("contact");
        latitude=jsonObject.getString("latitude");
        longitude=jsonObject.getString("longitude");
```

```
            String imageName = jsonObject.getString("image");
            // get resource id by image name
            final int resourceId = resources.getIdentifier(imageName, "drawable",
getPackageName());
            Bitmap bitmap = BitmapFactory.decodeResource(getResources(),
resourceId);
            imImage.setImageBitmap(bitmap);
        } catch (JSONException e) {
            e.printStackTrace();
        }
    }

}
```

B. Screenshots




6:00
72%
Temples
Adi Kumbeswarar Temple
Kasi Viswanathar Temple
Nageswaraswamy Temple
Ramaswamy Temple
Sarangapani Temple

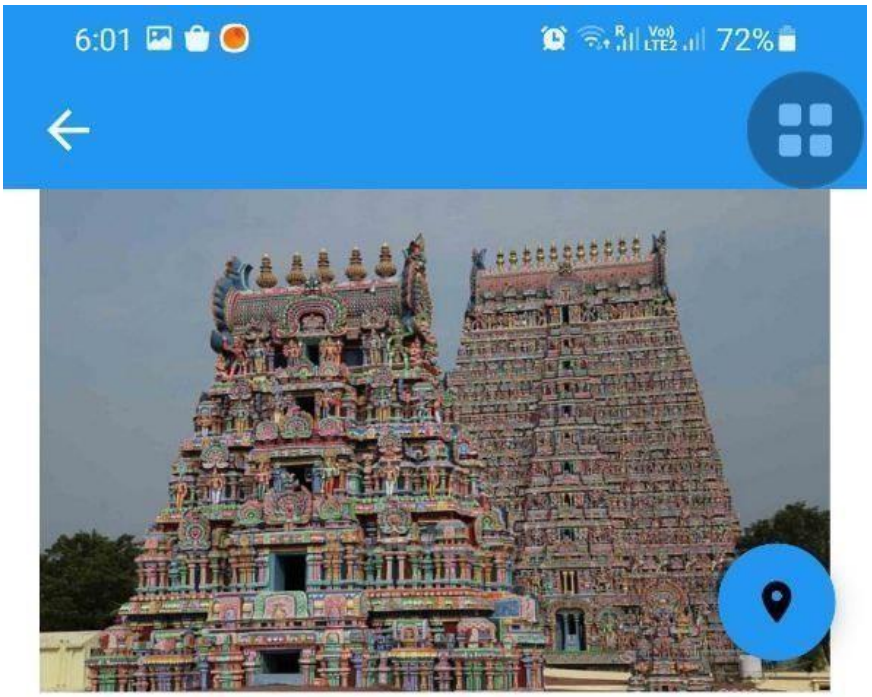


Adi Kumbeswarar Temple

Description

It is a Hindu Temple dedicated to the deity shiva, located in the town of Kumbakonam in Thanjavur District Tamil Nadu, India. Shiva is worshiped as Adi Kumbeswarar, and is represented by the lingam. His consort Parvati is depicted as Mangalambigai Amman. The presiding deity is revered in the 7th century Tamil Saiva canonical work, the Tevaram. The temple complex covers an area of 30,181 sq ft (2,803.9 m2) and houses four gateway towers known as gopurams. The tallest is the eastern tower, with 11 stories and a height of 128 feet (39 m) The temple has numerous shrines, with those of Kumbeswarar and Mangalambigai Amman being the most prominent. The temple complex houses many halls; the most notable is the sixteen-pillared hall built during the Vijayanagar period that has all the 27 stars and 12 zodiacs sculpted in a single stone. The temple has six daily rituals at various times from 5:30 a [illegible] y festivals on its calendar, with the Masi Magam festival celebrated during the Tamil month of Maasi (February - March) being the most prominent.The present masonry structure was built during the

Adi Kumbeswarar Temple

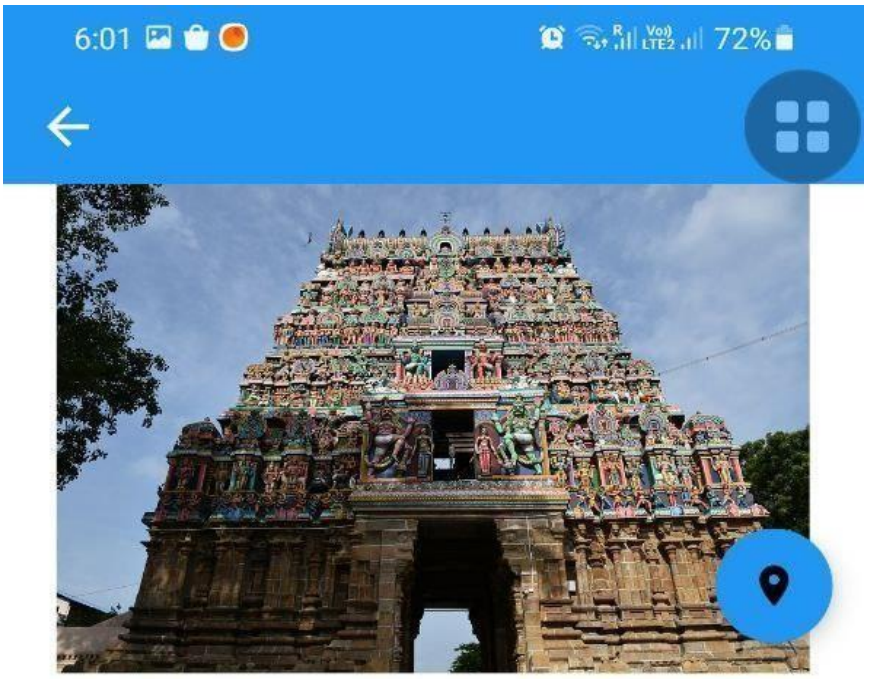


Kasi Viswanathar Temple

Description

It is a Hindu temple dedicated to the deity Shiva, located in Kumbakonam, Tamil Nadu, India. Shiva is worshipped as Kasi Viswanathar, and is represented by the lingam. His consort Parvati is depicted as Visalakshi. The temple complex covers two acres and is located close to the Mahamaham tank. It houses two gateway towers known as gopurams. The tallest is the western tower, with seven stories and a height of 72 feet (22 m). The temple has six daily rituals at various times from 6:00 a.m. to 9 p.m., and twelve yearly festivals on its calendar. The Masi Magam festival is celebrated during the day of the Magam (February - March) is the most prominent festival. The present masonry structure was built during the Nayak during the 16th century. In modern times, the temple is maintained and administered by the Hindu Religious and Charitable Endowments Departme Nadu.

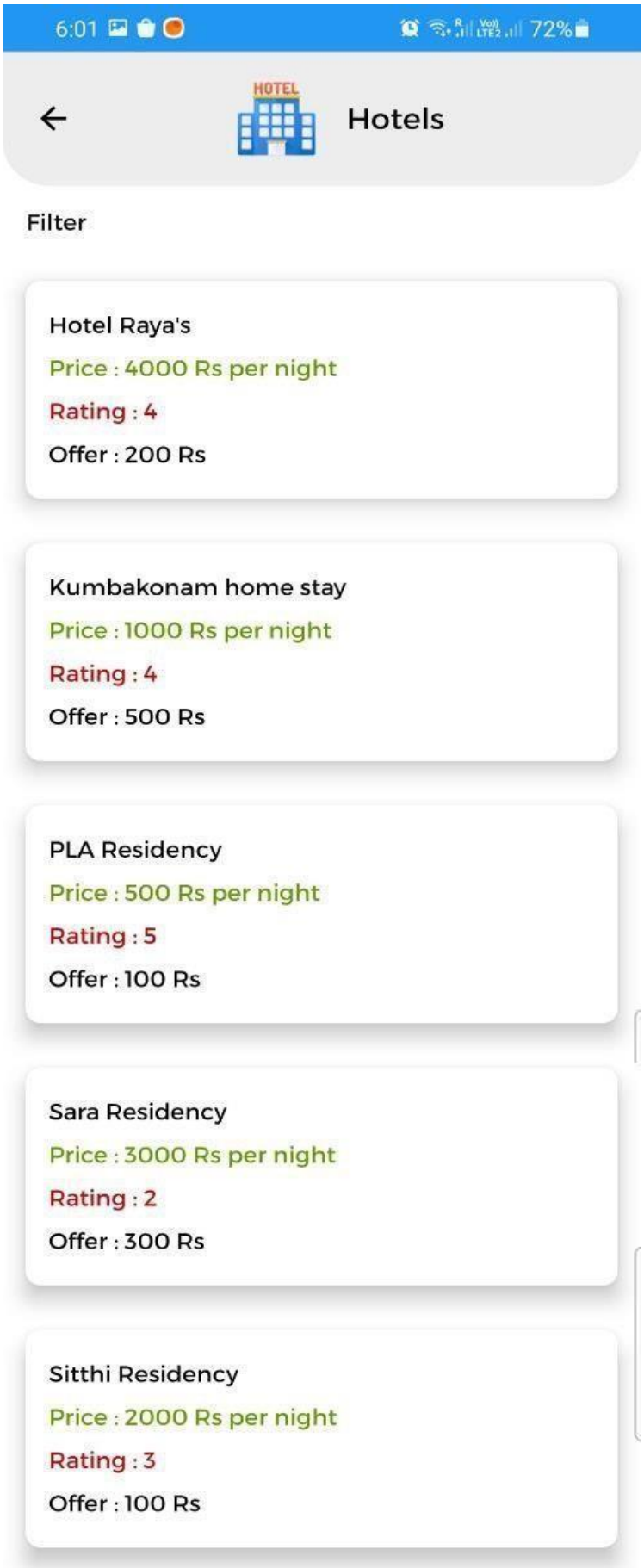
Kasi Viswanathar Temple

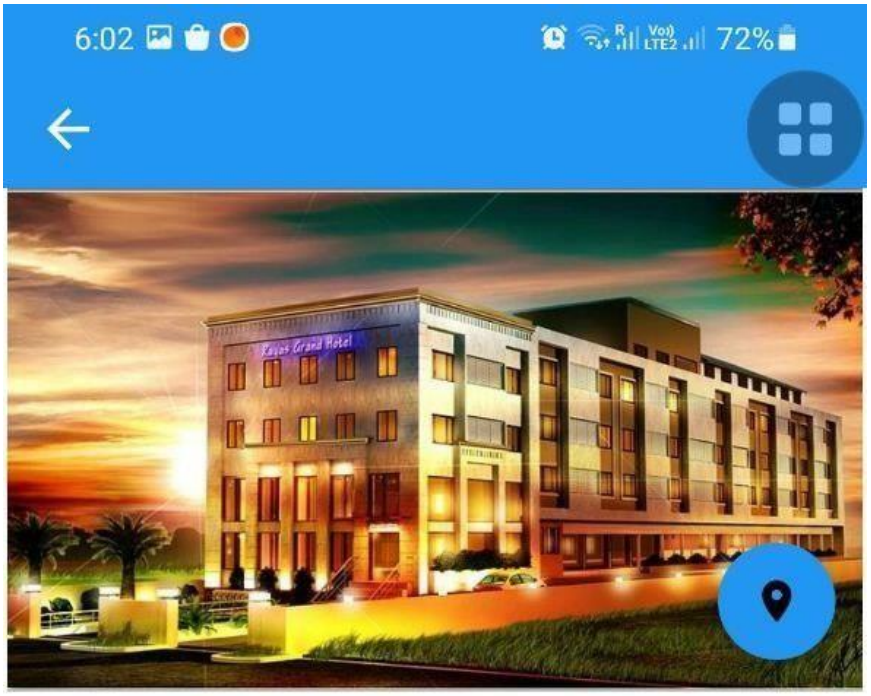


Nageswaraswamy Temple

Description

It is a Hindu temple dedicated to Shiva located in Kumbakonam in Thanjavur district, Tamil Nadu, India. The temple is counted as the earliest of all Chola temples. Shiva in the guise of Nagaraja, the serpent king. There are many inscriptions associated with the temple indicating contributions from Cholas, Thanjavur Nayaks and Thanjavur Maratha kingdom. The oldest parts of the present masonry structure were built during the Chola dynasty in the 9th century, while later expansions, including the towering gopuram gatehouses, are attributed to later periods, up to the Thanjavur Nayaks during the 16th century.The temple complex is one of the largest in the state and it houses three gateway towers known as gopurams. The temple has numerous shrines, with those of Nageswarar, Pralayamkathanathar and Periyanayagi being the most prominent. The temple complex houses many halls and three precincts; the most notable is the second precinct built during the Vijayanagar period that has many sculptures. The temple has six daily rituals at various times from 5:30 a.m. to 10 p.m., and twelve yearly festivals on its calendar. The temple is


6:01
72%
HOTEL
Hotels
Filter
Hotel Raya's
Price : 4000 Rs per night
Rating : 4
Offer : 200 Rs
Kumbakonam home stay
Price : 1000 Rs per night
Rating : 4
Offer : 500 Rs
PLA Residency
Price : 500 Rs per night
Rating : 5
Offer : 100 Rs
Sara Residency
Price : 3000 Rs per night
Rating : 2
Offer : 300 Rs
Sitthi Residency
Price : 2000 Rs per night
Rating : 3
Offer : 100 Rs

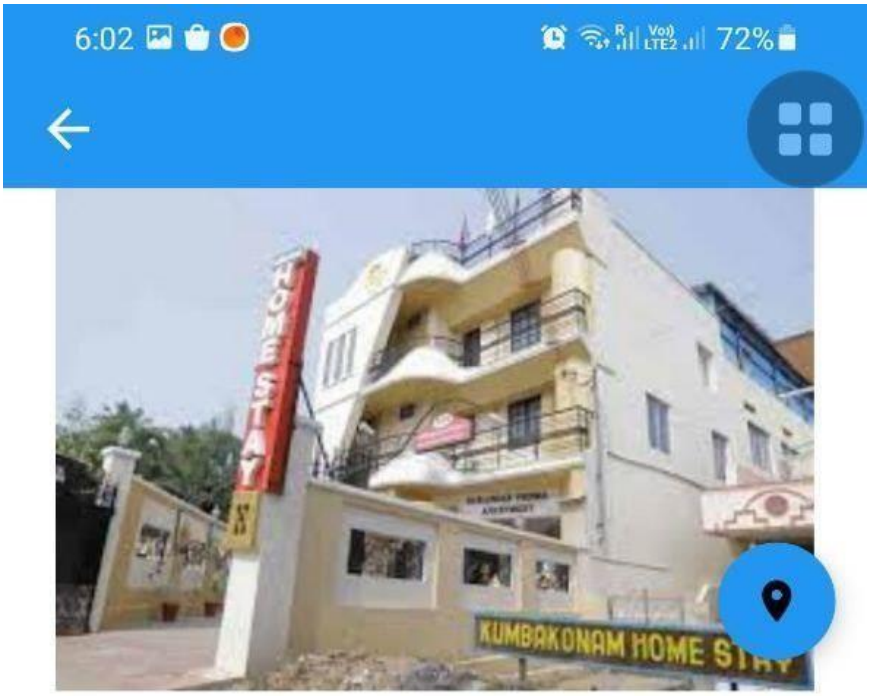


Hotel Raya's

Description

Located in the hub of Kumbakonam, Hotel Raya's stands out Majestically to offer Mahamaham tank view for the guests. With our recent renovations, this is known to be the "Best value for money" in Kumbakonam with the atmosphere and facilities of a star hotel. Hotel Raya's combines efficiency with the Traditional culture of Kumbakonam to provide a pleasant stay for all its guests.Raya's Group of Hotels situated in the heart of the city very near to the Holy Mahamaham Tank.

Hotel Raya's

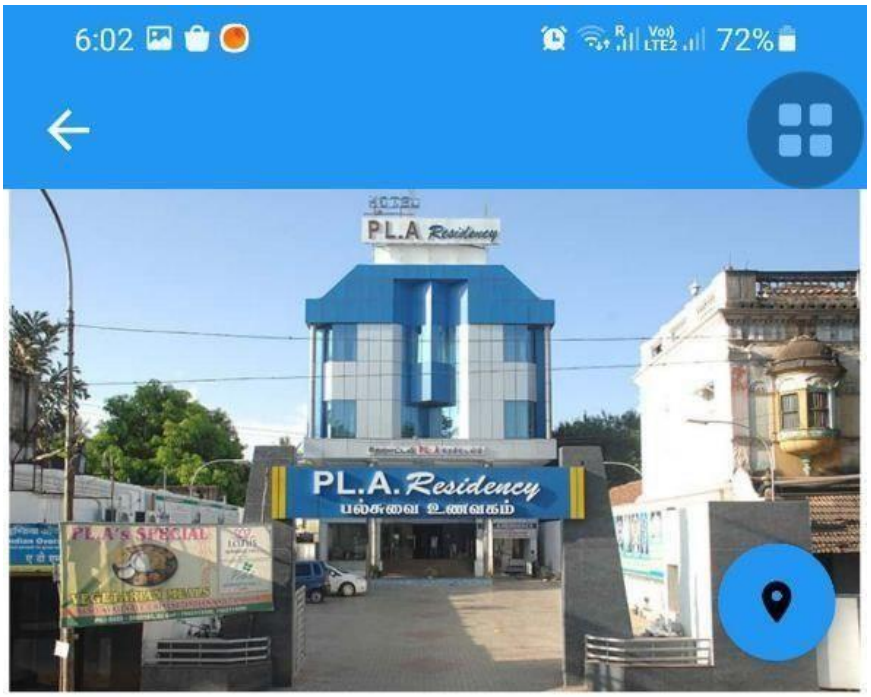


Kumbakonam home stay

Description

It is recognized as service apartment home stay place for the budget travelers the home stay blends the traditional culture of cholas with modern amenities for the travelers it is well professionally managed with expert staffs who got trained in hospitality industry we offer atmosphere like home for the guest it is located in the heart of the city the indelible experience is fashioned to make your visit perfect time and again the hotel is designed in a warm and inviting traditional style and our rooms are well appointed with your comfort in mind.

Kumbakonam home stay

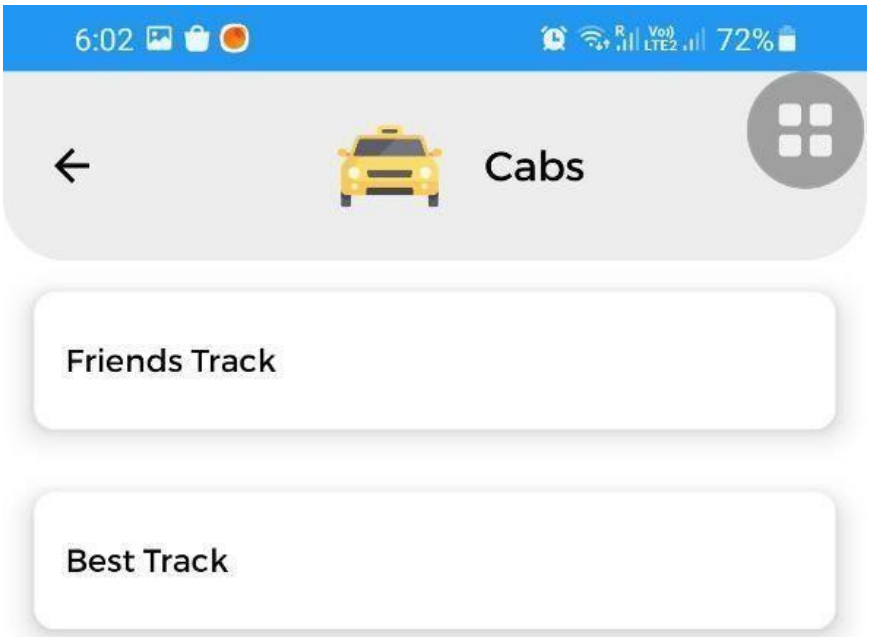


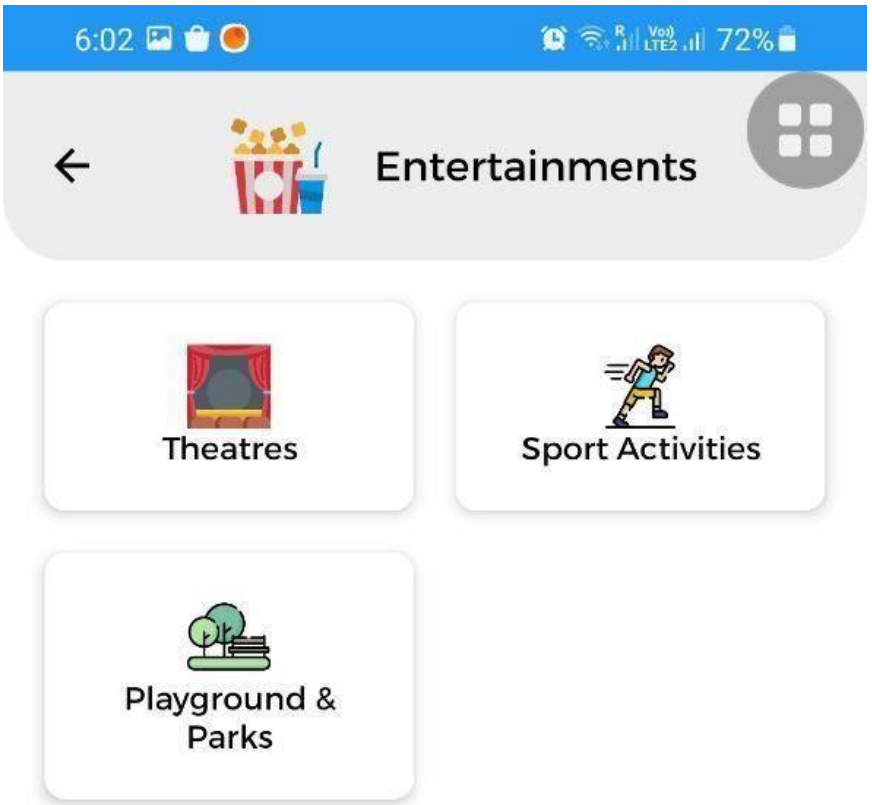
PLA Residency

Description

P LA Residency is a budget property, located at an accessible distance from 160 metres from Kumbakonam and 750 metres from Kumbakonam Bus Stop. Conveniently located in the heart of the city, the hotel is suitable for leisure travellers. The property renders facilities like conference hall, business centre, Wi-Fi facility, art boutique, room service, doctor on call, CCTV and travel assistance. All major credit cards accepted. Featuring capacious and spotlessly clean rooms equipped with modern conveniences like intercom facilities and attached bathrom with hot/cold water. Guests can relish a number of dishes at the multi-cuisine restaurant that features pleasant ambience and a wide range of mouthwatering foods.

PLA Residency


6:02
72%
Cabs
Friends Track
Best Track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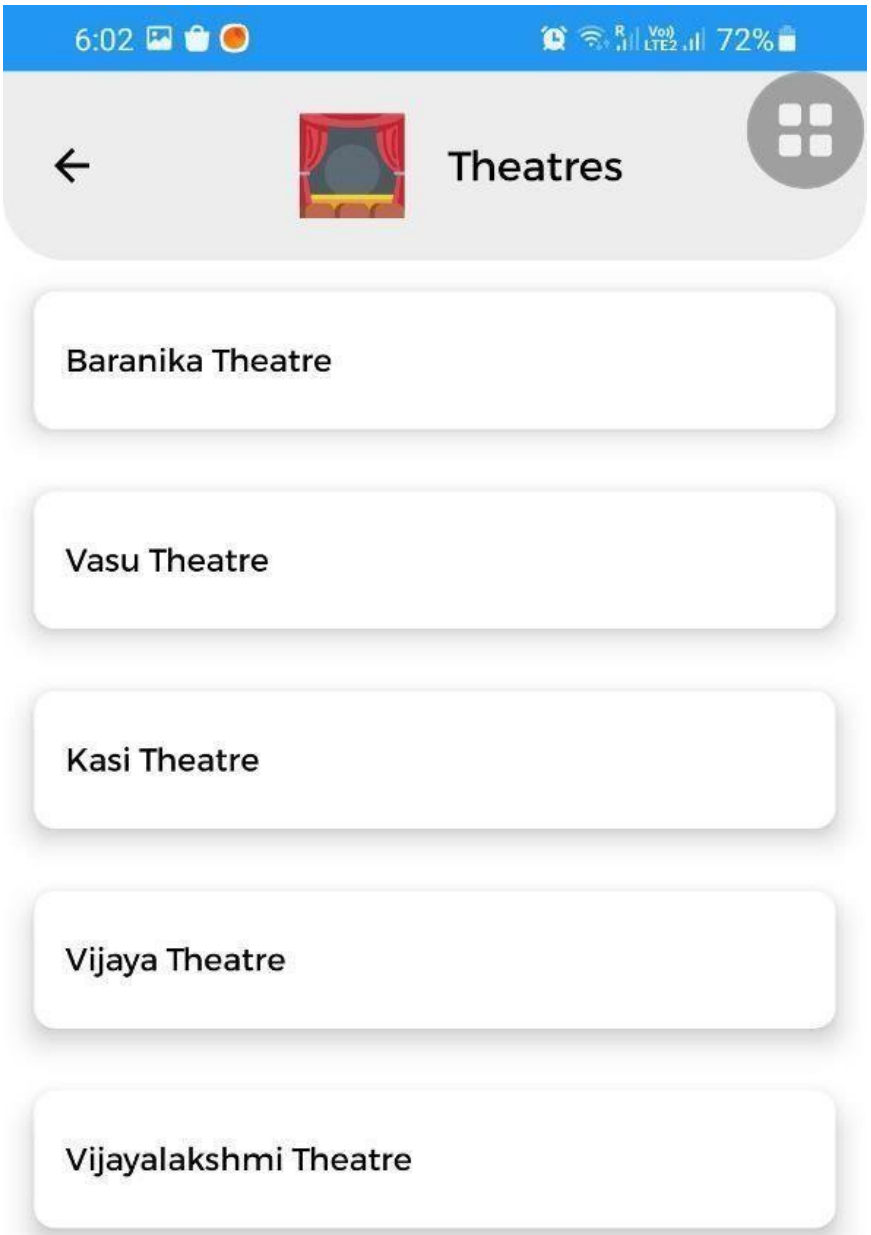
Entertainments
Theatres
Sport Activities
Playground &
Parks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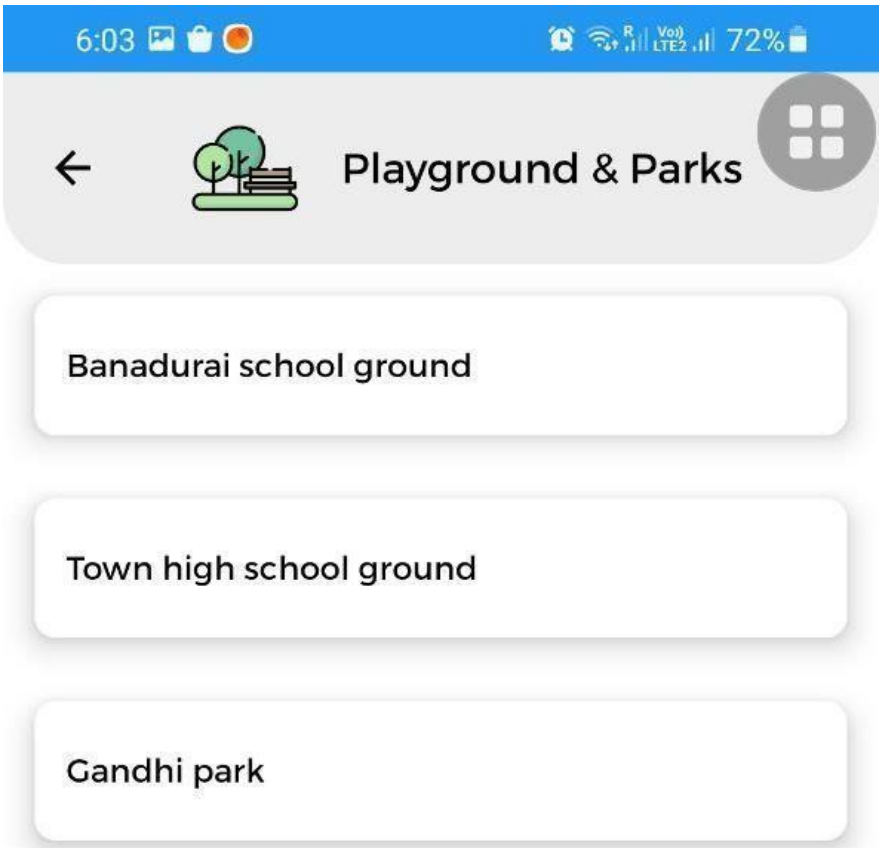
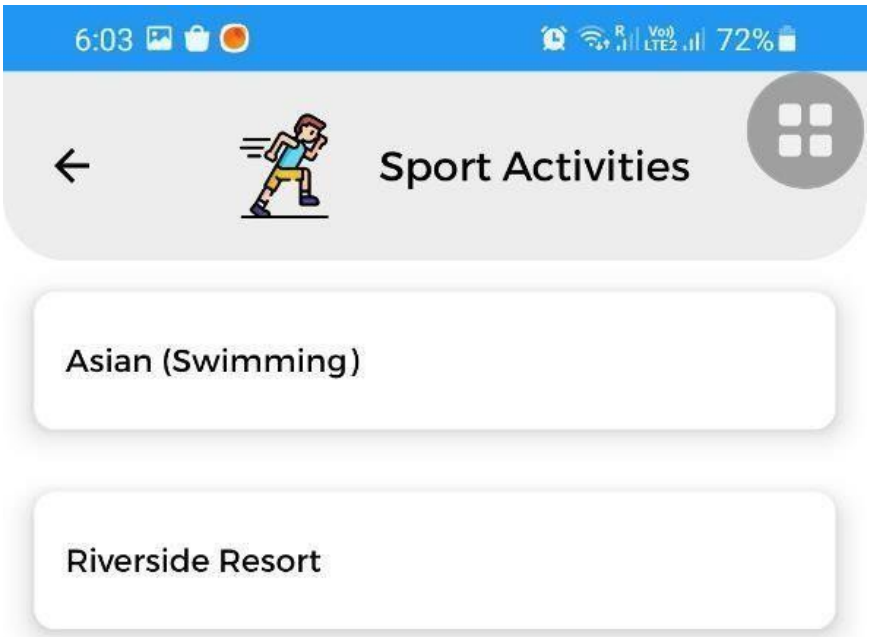
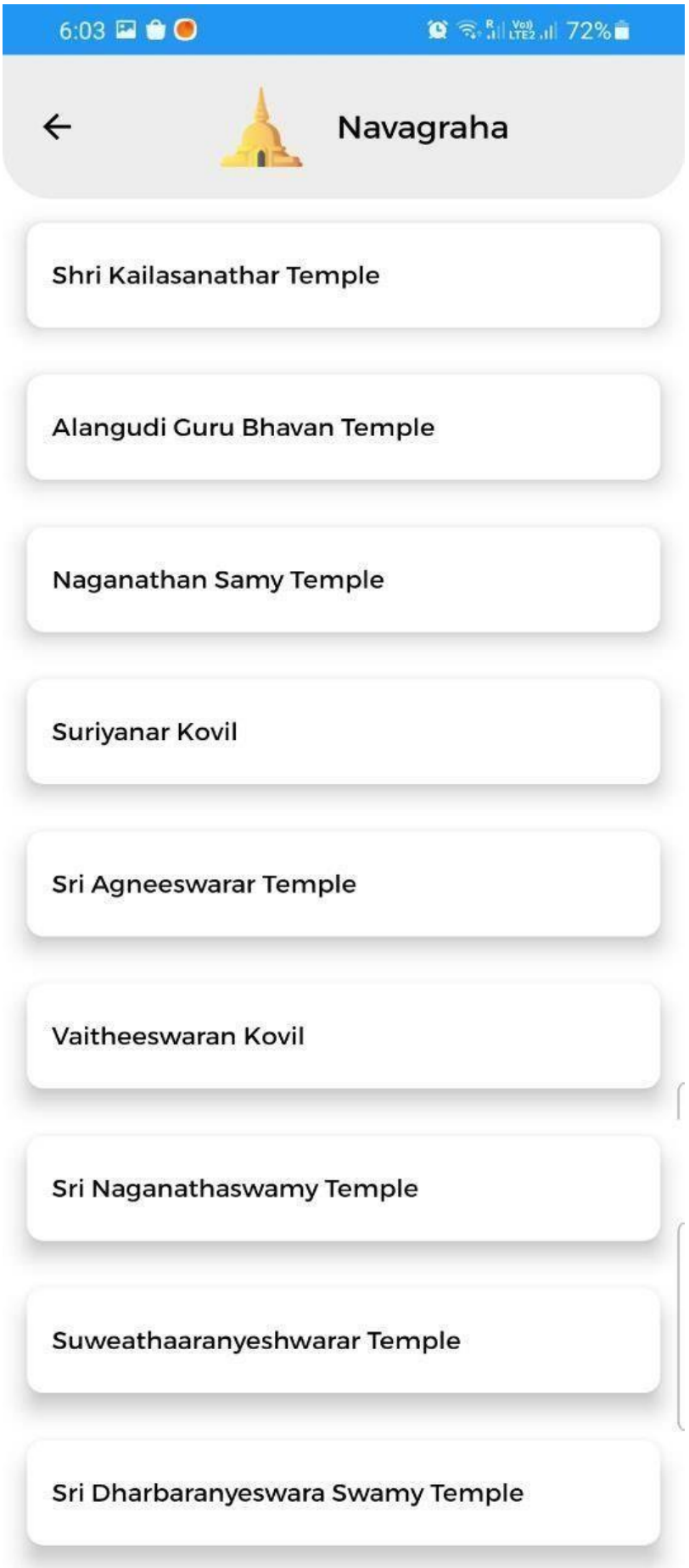
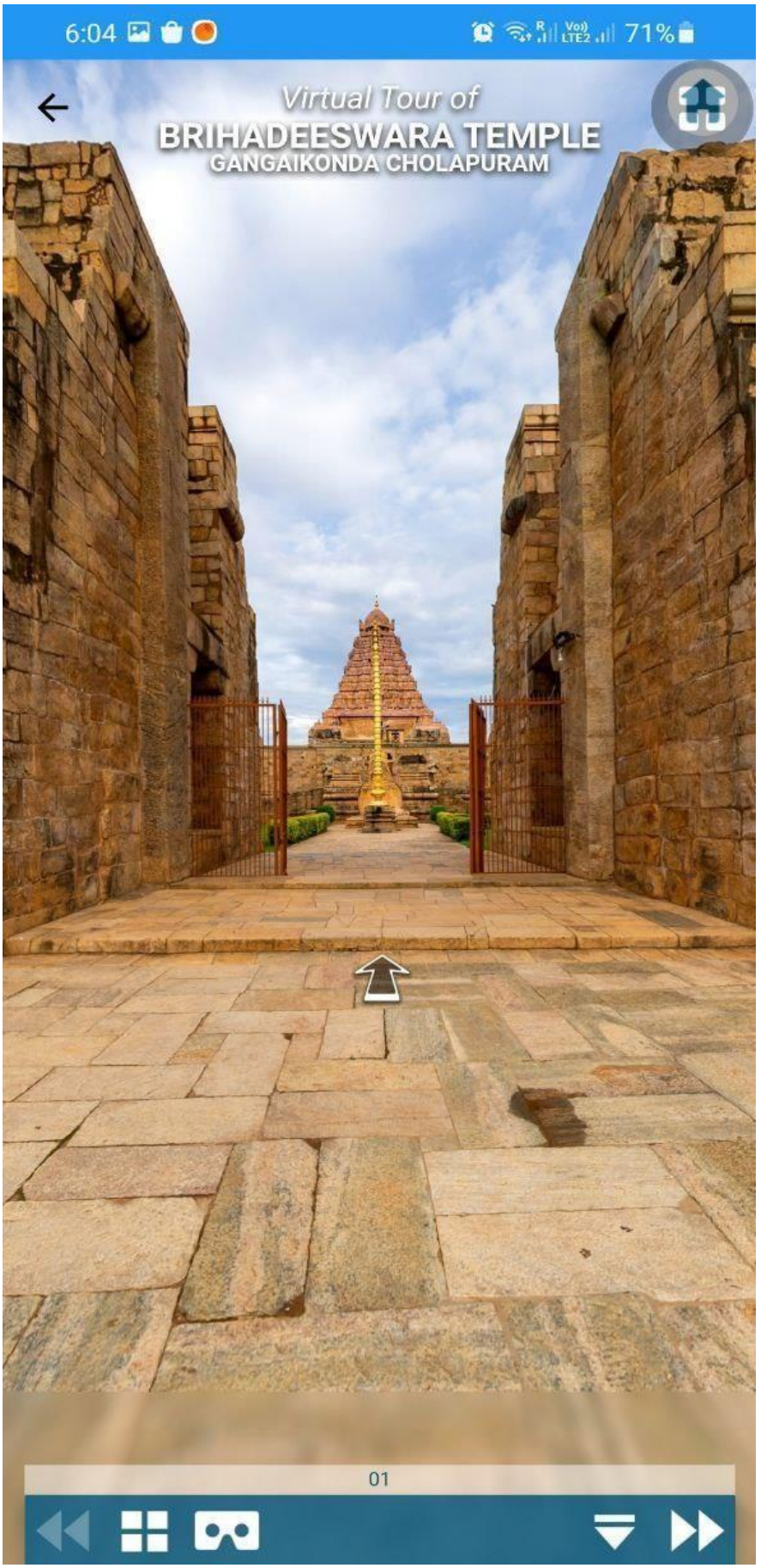
Theatres
Baranika Theatre
Vasu Theatre
Kasi Theatre
Vijaya Theatre
Vijayalakshmi Theatre


6:03
72%
Playground & Parks
Banadurai school ground
Town high school ground
Gandhi park


6:03
72%
Sport Activities
Asian (Swimming)
Riverside Resort


6:03
72%
Navagraha
Shri Kailasanathar Temple
Alangudi Guru Bhavan Temple
Naganathan Samy Temple
Suriyanar Kovil
Sri Agneeswarar Temple
Vaitheeswaran Kovil
Sri Naganathaswamy Temple
Suweathaaranyeshwarar Temple
Sri Dharbaranyeswara Swamy Temple


6:04
71%
Virtual Tour of
BRIHADEESWARA TEMPLE
GANGAIKONDA CHOLAPURAM
01


6:05
71%