

Smart Audio Navigation System for Tourists

¹Swathi M (4MC23CS167) CSE, Malnad College of Engineering (Hassan)

²Varshini K L (4MC23CS179) CSE, Malnad College of Engineering (Hassan)

³Samruddhi H S (4MC23CS197) CSE, Malnad College of Engineering (Hassan)

⁴Mohan S K (4MC24CS411) CSE, Malnad College of Engineering (Hassan)

⁵Dr. B Uma, Professor, Malnad College of Engineering (Hassan)

Abstract

Tourism is really important for keeping our culture alive helping our economy grow and bringing people from around the world together. When tourists visit temples, museums, old monuments and special heritage places they often have a time understanding what these places mean what they represent and how they were built.

Tourists usually have to rely on guides or paper brochures to learn about these places but these are not always available and can be hard to understand if you do not speak the language.

To fix these problems we came up with a Smart Audio Navigation System for Tourists Using QR Codes. This system uses QR codes to give tourists audio explanations and information about the places they visit in their language through a phone app. We put QR codes near sculptures and old buildings. When tourists scan the QR code the system finds the information they need and plays it back to them in a language they can understand, like English, Kannada or Hindi.

The system we made has parts, including a QR code scanner, a database to store information a way to choose your language, audio guides and suggestions for where to go next. We use a kind of database to store information about tourists, sculptures, languages and audio files. Our system is better because it helps tourists have an engaging experience does not need human guides as much and is cheap and easy to take care of.

In the future we can make the system better by adding things, like GPS navigation, artificial intelligence assistants, special reality effects and cloud-based analytics.

The main points of our system are Smart Tourism, QR Code, Audio Guidance, Multilingual System, Tourist Information System, database management system and Mobile Application.

1 Introduction

Tourism is one of the industries that is growing fast all around the world. It helps to preserve the buildings and cultural things that are important to us. Every year a lot of tourists visit temples, museums and historical places to learn about the past and the traditions of those places.. Many tourists have a hard time understanding the importance of old sculptures and buildings because they do not speak the language and there is no one to guide them properly.

The old way of guiding tourists is to use guides, brochures or information boards.. Human guides are not always available and they can be very expensive. Information boards are not very helpful because they do not talk to you and they are usually in one language. Tourists from countries often have trouble understanding the information at historical places.

Nowadays we have technologies like mobile applications QR codes and digital information systems that can help tourists. QR codes are very useful because they are easy to make do not cost much and're easy to use. When you scan a QR code with your phone you can get a lot of information quickly.

The Smart Audio Navigation System for Tourists Using QR Codes is a system that provides audio guidance in many languages using QR codes. QR codes are put near sculptures and tourist places. When a tourist scans the QR code with their phone the system gets the information from the database. Plays an audio explanation in the language they choose.

This system is very helpful for tourists because it makes it easier for them to get information and it is more fun. It also reduces the need for ways of guiding tourists. The system shows us how database management, mobile technologies and smart tourism ideas can be used in a way. Tourism is an important industry and the Smart Audio Navigation System for Tourists Using QR Codes is a great example of how tourism can be improved with the help of new technologies. Tourism and QR codes are a combination that can make traveling easier and more enjoyable, for tourists.

2 Literature Survey

Several researchers have come up with tourism systems that use things like artificial intelligence and object recognition. They also use GPS navigation and mobile applications and virtual reality.

Shi and his team proposed a tourism interpretation system that is based on light control technology. This system uses light communication technology to provide automatic interpretation functions. These functions include text guidance and intelligent navigation and audio explanations. The research focused on improving tourist experiences using smart communication systems.

WanderGenie introduced a tourism guidance system that uses Generative AI and RFID technology and image processing and autonomous navigation systems. This system provides tourist interaction and landmark recognition and real-time tourism information using conversational AI tech-

nologies. The research shows how artificial intelligence can improve user interaction and tourism accessibility.

GuideMe proposed an application that uses GPS and deep-learning-based object recognition to identify holy places and tourist attractions. This system supports image recognition and GPS-based tourist guidance and digital information retrieval.

Another intelligent tourism system is based on computer data and virtual reality technologies. This system focuses on tourism management and virtual roaming and route planning and panoramic tourism experiences. It integrates cloud computing and mobile internet technologies and smart tourism management systems.

Even though existing systems provide smart tourism solutions many of them need expensive infrastructure or advanced hardware devices or continuous internet connectivity or complex implementation methods. There is still a need for a low-cost and multilingual tourism guidance system that can be implemented easily in temples and museums and historical locations.

The proposed Smart Audio Navigation System addresses these limitations by using QR-code-based access and audio guidance and mobile applications and relational database management systems. The proposed Smart Audio Navigation System is simple and user-friendly and scalable and easy to maintain. The Smart Audio Navigation System is a solution for people who want to explore new places. The Smart Audio Navigation System can be used in different locations. The Smart Audio Navigation System is an option, for people who want a simple and easy to use tourism guidance system.

3 Problem Statement

When people visit buildings, temples and museums they often have a hard time understanding what the statues and buildings mean. Tourists may not always be able to get a guide and even when they do they might not be able to talk to them because of language problems.

The old ways of giving tours are expensive and hard to take care of. They do not always give people the information they want in their own language. People can get brochures. Look at signs but these are not very helpful and do not do much. This is especially true, for tourists who speak languages. So we need a tourist guide system that's smart and easy to use and can give people information in many languages without costing too much.

This system should be able to give people information and audio explanations when they scan a QR code, which is a special kind of code that phones can read

4 Objectives of the Project

The major objectives of the proposed system are:

1. To provide automatic audio guidance for tourists.
2. To support multiple languages for better accessibility.
3. To provide historical and cultural information digitally.
4. To reduce dependency on human tourist guides.

5. To improve tourist engagement using smart technologies.
6. To create a low-cost and easy-to-maintain tourism guidance system.
7. To provide an efficient digital tourism information platform.
8. To support future expansion using advanced tourism technologies.

5 Proposed System

The Smart Audio Navigation System for Tourists is an idea.

It uses QR Codes to give tourists audio explanations in languages. The Smart Audio Navigation System for Tourists also gives tourist information using QR-code technology and mobile applications. The Smart Audio Navigation System for Tourists puts QR codes near sculptures, monuments and tourist attractions. Each QR code is special. Is connected to a database record that has details about the sculpture, historical information, cultural significance and descriptions of the architecture.

The database record also has files in many languages for the Smart Audio Navigation System for Tourists. When a tourist scans the QR code with the application the QR scanner figures out the QR value and sends it to the database module. The Smart Audio Navigation System for Tourists then gets the information and lets the tourist choose the language they like. The audio guidance module then plays the explanation in the language the tourist chose for the Smart Audio Navigation System for Tourists. The Smart Audio Navigation System for Tourists also keeps track of the tourist attraction or sculpture that it thinks the tourist should see.

Even though the current Smart Audio Navigation System for Tourists does not have navigation it can be added in the future with GPS and map integration systems for the Smart Audio Navigation System, for Tourists.

The proposed system provides:

- Multilingual audio guidance
- QR-code-based digital information access
- Historical and cultural information retrieval
- Low-cost implementation
- User-friendly tourist interaction
- Scalable database management

6 System Architecture

The Smart Audio Navigation System is made up of parts that work together. These parts help give tourists information in languages using QR codes.

First we put QR codes near sculptures and tourist spots.

Then the tourist uses an app to scan the QR code.

The mobile app reads the QR code. Lets the tourist pick a language they like such as English, Kannada or Hindi.

After the tourist picks a language the Smart Audio Navigation System gets the information from a big collection of data.

This information is then sent to a tool that turns written words into audio so the tourist can hear it.

The audio is in the language the tourist picked.

Finally the Smart Audio Navigation System gives the information to the tourist.

This helps tourists have a time and makes visiting places more fun and interesting for people who speak different languages.

The Smart Audio Navigation System is a way to make tourism more fun and interactive, for everyone.



Figure 1: System Architecture of Smart Audio Navigation System

The major modules of the system are:

- QR Code Module
- Mobile Application Module
- Language Selection Module
- Content Database Module
- Text-to-Speech Engine
- Audio Guidance Module
- Admin Management Module

The architecture ensures efficient information retrieval, multilingual accessibility, easy maintenance, and scalable smart tourism management.

7 Methodology

The methodology of the Smart Audio Navigation System focuses on providing efficient tourist guidance using QR-code-based information retrieval and multilingual audio support.

7.1 QR Code Scanner Module

The QR Code Scanner Module is what we use to scan those QR codes you see near sculptures and monuments. Each QR code has a code inside that tells us which tourist attraction it is for.

When you scan the QR code with your phone the scanner figures out what the code means and sends that information to the database retrieval module. I think QR codes are great because they work fast do not cost a lot to set up and are easy to take care of. The QR Code Scanner Module and QR codes really make things simple, for us.

7.2 Database Module

The Database Module stores tourist place information, sculpture details, QR-code mappings, multilingual audio files, and language information.

The database is implemented using relational database management system concepts. Primary keys and foreign keys are used to establish relationships between different tables.

The database stores:

- Tourist place information
- Sculpture details
- Historical descriptions
- Cultural significance
- Language data
- Audio files
- QR-code mappings

The database module ensures efficient storage, retrieval, and management of tourist information.

7.3 Language Selection Module

The Language Selection Module allows tourists to select preferred languages such as English, Kannada, and Hindi.

After selecting the language, the system retrieves the corresponding audio explanation from the database and provides multilingual audio guidance.

This module improves accessibility for domestic and international tourists.

7.4 Audio Guidance Module

The Audio Guidance Module retrieves audio explanations from the database and plays them automatically after the QR code is scanned.

The module provides:

- Historical explanations
- Architectural details
- Cultural significance
- Tourist information

The audio guidance system improves user interaction and provides an immersive tourism experience.

7.5 Navigation Suggestion Module

The Navigation Suggestion Module recommends the next sculpture or tourist attraction based on the current scanned location.

Although advanced GPS-based navigation is not fully implemented in the current version, future versions of the system can integrate:

- GPS-based navigation
- Smart route optimization
- AI-based tourist assistants
- Map integration
- Augmented reality navigation

7.6 System Workflow

The complete workflow of the system is as follows:

1. Tourist opens the mobile application.
2. Tourist scans the QR code near the sculpture.
3. QR code is decoded by the scanner.
4. Database retrieves corresponding information.
5. Tourist selects preferred language.
6. Audio explanation is played.
7. Additional tourist information is displayed.
8. Suggested next attraction is provided.

8 Database Design

The proposed system uses relational database concepts for storing tourist information efficiently.

8.1 Tourist Places Table

Field Name	Data Type	Description
place_id	INT	Place identifier
place.name	VARCHAR	Tourist place name
location	VARCHAR	Tourist location
description	TEXT	Tourist place details

Table 1: Tourist Places Table

8.2 Sculptures Table

Field Name	Data Type	Description
sculpture_id	INT	Sculpture ID
place_id	INT	Place reference
sculpture.name	VARCHAR	Sculpture name
historical.info	TEXT	Historical details

Table 2: Sculptures Table

9 ER Model Explanation

The ER model represents relationships between Tourist Places, Sculptures, QR Codes, Languages, and Audio Guides.

- One Tourist Place contains many Sculptures.
- One Sculpture is associated with one QR code.
- One Sculpture can contain multiple audio guides.
- Each audio guide belongs to one language.

Primary keys uniquely identify records while foreign keys establish relationships between tables.

10 Advantages of the Proposed System

The proposed system offers several advantages:

1. Easy to use for tourists.
2. Low implementation cost.
3. Supports multilingual audio guidance.
4. Improves tourist engagement.
5. Reduces dependency on human guides.
6. Easy maintenance using QR codes.
7. Provides accurate historical information.
8. Improves accessibility for foreign tourists.
9. User-friendly mobile application interface.
10. Scalable for large tourist attractions.

11 Results and Discussion

The system we came up with works well for helping tourists using QR codes and audio explanations in languages.

It stores a lot of information like details about tourist spots, sculptures and the audio guides in different languages.

When tourists scan a QR code they can quickly get the information they need with a few taps.

The audio guides in languages help tourists from different places understand and enjoy their visit more.

Our solution is also easy on the budget. Can be easily expanded to help manage tourist spots like temples, museums and historical sites.

The system helps a lot in managing tourist information. It stores information about sculptures. Provides audio guidance in many languages. Tourists can quickly get information by scanning a QR code. The audio guidance system helps tourists who speak languages. The system is also good for places, like temples and museums. It is cost and can be scaled up easily.

The proposed system demonstrates practical implementation of:

- Relational database concepts
- Mobile application technologies
- QR-code integration
- Smart tourism systems
- Audio management systems

12 Future Scope

The proposed system can be further enhanced using advanced smart tourism technologies.

Future enhancements include:

- GPS-based navigation
- Artificial intelligence-based tourist assistants
- Augmented reality integration
- Cloud database integration
- Offline audio support
- Smart route optimization
- Voice-command interaction
- Tourist analytics and feedback systems

Future developments can transform the system into a fully intelligent tourism platform.

13 Conclusion

The Smart Audio Navigation System for Tourists Using QR Codes is a way to help tourists at temples and museums and old historical places. It uses QR codes and audio that talks to you in languages and special apps on your phone and a way to keep all the information organized.

This system is good because it helps tourists who do not speak the language and it means they do not have to rely on a human guide all the time. The Smart Audio Navigation System for Tourists Using QR Codes is easy to use. It does not cost too much money. It is also easy to make bigger or smaller depending on what's needed.

The people who take care of the Smart Audio Navigation System for Tourists Using QR Codes can fix it easily if something goes wrong.

In the future the Smart Audio Navigation System for Tourists Using QR Codes can be even better with things like GPS navigation and special helpers that use intelligence and special reality that is increased and cloud integration.

The Smart Audio Navigation System, for Tourists Using QR Codes will keep getting better and better with these things.

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