

# QR Code Application - Smart Tourism Development Solution in Vietnam

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**Abstract** - The Fourth Industrial Revolution, with a focus on digital technology and the impact of the Covid-19 pandemic, has brought new development potential to tourist destinations. The application of QR codes for tourist destinations in Vietnam is an inevitable trend and a solution for developing smart tourism destinations in the current situation. This article analyzes the benefits of using QR codes at tourist destinations and concludes that the application of QR codes is an effective solution for the development of smart tourist destinations in Vietnam, contributing to the sustainable development of tourism.

**Keywords** - QR code, destination, technology adoption, smart tourism destination.

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## I. Introduction

The Covid-19 pandemic has paralyzed and completely frozen the tourism industry in Vietnam. Since March 15, 2022, when the government allowed the reopening of tourism and the restoration of many international flights, the tourism sector has gradually started to recover. However, up until now, there is a possibility of a resurgence of the Covid pandemic. Will the situation of service cancellations by tourists, tourism businesses having to lay off employees, operating cautiously, and even temporarily suspending operations continue to occur? What solutions can help tourism businesses sustain themselves in the challenging economic environment?

The article aims to propose a solution for the implementation of synchronized QR code technology at all tourist destinations in Vietnam, contributing to the development of smart tourism destinations in Vietnam. This proposal is based on researching relevant information regarding smart tourist destinations, customer acceptance of technology, the benefits of QR codes, and the trends of digital technology in the era of the Fourth Industrial Revolution.

## II. Defining Smart tourism destination

With the development of the 4.0 technology, the concept of "smart" is becoming increasingly popular and closely linked to the integration of technology in various sectors, including the tourism industry.

Smart tourism destinations are tourist locations that utilize technology and smart solutions to provide better travel experiences and enhance convenience for tourists.

According to the Spanish Institute for Tourism Innovation (SEGITTUR) in collaboration with the National Standardization Agency AENOR, a smart tourism destination is defined as "an innovative and creative tourism area that is easily accessible to everyone and built on a foundation of modern technological infrastructure, ensuring the sustainable development of the territory, facilitating the interaction of visitors and their integration with the surrounding environment, and enhancing the quality of their experiences at destinations and the quality of life for residents [1].

A smart tourism destination can be understood as a tourism space supported by ICT applications and other advanced technologies (such as Internet of Things, cloud computing, and user-centric Internet services) aimed at enhancing the visitor's experience and improving the quality of life for residents. Additionally, it involves innovative management principles, sustainability, access to information, knowledge creation, and governance. Smart tourism destinations operate through collaborative decision-making, intelligence, and continuous interaction among various stakeholders, all facilitated by leveraging the capabilities provided by emerging technologies [2].

The features of a smart tourism destination include:

Smart tourism information: Providing detailed information about tourist attractions, itineraries, activities, and ongoing events through mobile applications, websites, or interactive information boards.

Interactive experiences: Utilizing interactive technologies such as virtual reality (VR) and augmented reality (AR) to deliver immersive and interactive experiences for tourists.

Smart navigation system: Offering smart navigation solutions, including GPS maps, optimized routing guidance,

and suggestions for public transportation or modes of transportation.

Smart and sustainable destination: Implementing sustainable solutions such as energy and resource management, waste reduction, and encouraging tourists to participate in environmental and cultural preservation activities.

Smart transactions and payments: Supporting wireless payments, e-wallets, and electronic currency systems to provide convenience and security for tourists when making service payments and purchases.

Smart management and customer feedback: Utilizing data and analytics to enhance destination management, monitor tourist feedback, and implement improvements to enhance service quality.

### III. Technology adoption

Statistics from Hootsuite and We Are Social indicate that as of January 2023, there were 5.44 billion mobile phone users worldwide (accounting for 68% of the global population) and a staggering 5.16 billion internet users (representing 64.4% of the global population) [3].



Figure 3.1. Overview of Global Digital Usage in January 2023.

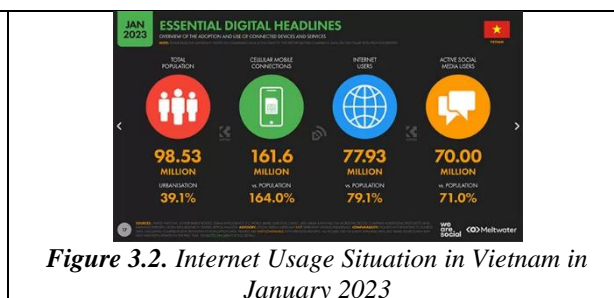


Figure 3.2. Internet Usage Situation in Vietnam in January 2023

In Vietnam, the population has surpassed the milestone of 98 million people, with 161.6 million mobile phone owners and nearly 78 million internet users [4].

Furthermore, according to data from Ookla, the average mobile internet connection speed in Vietnam was 39.59 Mbps in 2023, higher than the 35.14 Mbps in 2022. Similarly, the fixed broadband speed was 80.27 Mbps, an increase from the 2022 connectivity speed (~68.5 Mbps). The 10-20% increase in internet speed indicates significant improvement in Vietnam's internet telecommunication infrastructure over the past year. Additionally, 86.58% of internet access is performed through mobile devices, compared to only 12% on laptops and desktop computers. This demonstrates that the majority of Vietnamese people have adopted smartphones and internet connectivity for their daily lives and work purposes [3].

The installation of free Wi-Fi in tourist cities in Vietnam has been emphasized and implemented to provide free internet connectivity for both tourists and local residents. Some notable tourist destinations in Vietnam where this initiative has been implemented include:

Hanoi city has implemented the "Hanoi Smart City" project with the aim of improving the quality of smart living for residents and tourists. As part of this project, free Wi-Fi has been provided in certain public areas such as Hoan Kiem Lake, parks, the Old Quarter, and other tourist attractions.

Da Nang city has implemented the "Da Nang - Smart City" project with the goal of enhancing the quality of life and smart tourism experiences. Free Wi-Fi has been provided at popular tourist destinations such as My Khe Beach, Dragon Bridge, Son Tra Peninsula, and public parks.

The ancient town of Hoi An has also implemented free Wi-Fi in areas such as Hoi An Old Town, Japanese Covered Bridge, and other tourist spots. This facilitates convenient internet access for tourists to share their experiences.

The coastal city of Nha Trang has provided free Wi-Fi at some beaches and famous tourist sites such as Bai Truong, Bai Dai, and the city center. This enables tourists to easily access the internet while exploring and relaxing in the city.

The installation of free Wi-Fi in tourist cities in Vietnam, coupled with the sustainable increase in the number of mobile device users worldwide and in Vietnam, has brought about a significant transformation in personal behaviors in daily and professional activities. This necessitates companies to embrace these behavioral changes and come up with innovative solutions in a globally competitive environment.

Most potential customers visiting Vietnam already own smartphones with full internet connectivity, allowing them to access information anywhere, anytime. This presents an opportunity and favorable conditions for the tourism industry in Vietnam to fully exploit the advantages of QR codes, thereby promoting tourism destinations in Vietnam.

#### IV. QR Codes and the Benefits of their Applications

QR code, short for Quick Response code, is a matrix barcode or two-dimensional barcode that was created by Denso Wave (a subsidiary of Toyota) in 1994. QR codes typically contain data for a locator, identifier, or tracker that directs to a website or application [5].

QR codes consist of black squares arranged within a square grid on a white background and can be read by a barcode scanner or a smartphone with a camera function using a dedicated barcode scanning application [6].

The difference between QR codes and traditional barcodes lies in the amount of stored or shared data. Traditional barcodes have long, one-dimensional lines and can only hold 20 numeric characters, whereas two-dimensional QR codes can store thousands of alphanumeric characters. QR codes can store more information, and their user-friendly nature provides significant benefits to users in various fields.



*Traditional barcodes*



*QR Code*

**Figure 4.1.** Traditional barcodes and QR code

QR codes can store various types of information, including URL links, email addresses, phone numbers, and text [7]. Some notable advantages of using QR codes include [7]:

No special equipment required: QR codes can be easily generated and scanned using smartphones with built-in cameras.

Easy to use, quick, and accessible to users.

Allows storing more information than what can be printed on paper documents. Additionally, the information can be supplemented and updated at any time.

Compatible with multiple languages and character sets.

#### V. Potential Applications of QR Codes in the Development of Smart Tourism Destinations in Vietnam

Based on the benefits that QR codes bring, the tourism industry in Vietnam can apply and utilize QR codes for payment and tourism information, thereby attracting potential customers to visit Vietnam. Specifically:

Application of QR codes for payment:

All tourism services can integrate QR payment codes to provide convenience and speed for tourists. Therefore, when traveling, customers only need to have a smartphone with pre-installed online payment services to comfortably pay for food, entertainment, and shopping without using cash or accompanying bank cards.

Information about booked tour packages can be consolidated into a QR code, which customers receive via email or Zalo. When customers need to use a service within the tour, such as visiting a tourist attraction or registering at a hotel, they only need to present the QR code they received to the service provider for efficient assistance. Not having to present tickets or provide additional information during the tour enhances the customer's travel experience, increases convenience, reduces cumbersome procedures, and allows travel companies to track customer itineraries for timely support when needed.

Integration of tourist destination information in QR codes:

Integration of information about attractive tourist destinations in Vietnam for first-time visitors: All relevant information about attractive tourist destinations in Vietnam will be integrated into QR codes placed in the most convenient locations for customers to easily access. Using their smartphones, tourists can simply scan these QR codes to retrieve information about nearby tourist destinations in a simple and convenient manner. This eliminates the need for extensive banners or travel brochures, as tourists can obtain information about various destinations in different languages quickly and conveniently.

Integration of related introduction information about the destinations: QR codes are placed in convenient locations to provide introduction information about the destinations, including the meaning of symbols at the destinations, route instructions, or any other information that the tourism management agency wants to convey to tourists. Utilizing QR technology contributes to the professionalism of tourist destinations, creating the most favorable conditions for tourists to access destination information and guiding their perception of the destination as well as promoting it in a fast, efficient, and cost-effective way.

For example, when visiting museums, instead of having a tour guide explain the details of each exhibit, these locations can utilize QR codes to assist visitors. Visitors can use their personal smartphones with built-in

cameras and internet access to scan the QR codes associated with each exhibit. This allows them to read information, listen to explanations, view images, or watch videos introducing the location and the exhibited objects.

The information integrated within QR codes can be translated into multiple languages, making it easily accessible and serving a large number of visitors from different nationalities at the same time. QR codes not only help tourists actively and quickly grasp information about exhibited objects in museums but also assist managers in identifying popular and interesting areas by tracking the number of scans. This helps improve and enhance the quality of customer service

## **VI. Conclusion**

The article asserts that the application of QR codes at tourist destinations is an effective solution for developing smart tourism in Vietnam, contributing to efficiency and sustainable development in this field.

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