

**TECHNOLOGY ADVANCEMENT – QR CODE IN TRAVEL AND TOURISM
INDUSTRY**

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Abstract

QR code technology has emerged as a game-changing innovation that maximises productivity and redefines the visitor experience in the travel and tourist industry. Two-dimensional barcodes with a lot of data contained in them are called Quick Response codes, or QR codes for short. The most significant feature of QR codes is their capacity to accelerate information flow, which has increased in our daily lives due to recent expansions in smartphones and mobile technology. Users may quickly access, record, and use information that they would normally have to memorise or scribble down while strolling down the street, in a mall, a store, or in a newspaper by using a simple application on their smartphone and its camera. Therefore, in the digital age, a QR code is among the greatest graphic components for accelerating the flow of information. QR codes are a powerful tool for businesses to market their goods, but they also provide customers a wealth of information and convenience that is revolutionising how people move about and engage with the outside world. Based on review of the literature, this study identifies visitor experiences, the concept of QR Code technologies in the tourism sector, growing patterns of QR code usage among tourism destinations and making it a smart destination, and the effects of digital transformation on tourist experience through secondary data. The study suggests that using QR codes might significantly lessen the need for paper and improve the sustainability of tourism—two things that are constructive steps in the direction of a more sustainable and ecologically friendly future. It holds the key to opening up countless opportunities to provide unique, engrossing, and profound travel experiences. It could act as a link between digital and print media.

Keywords: QR Code, Barcode, Smart destination, Tourism, Travel, Technology Transformation

Introduction

The travel and tourism sector of today is significantly impacted by digital transformation and technological influence. Modern travellers have always found that the tourism business is at the front of utilising technology to boost their experience, and one of the main strategies being used to rebuild and revitalise the industry is the use of technology. The tourist industry will grow faster because to a number of facilities including computerization, contactless services, virtual experiences, and real-time information availability. The goal of these projects is to make travel and tourism more enjoyable overall. The most practical way to make payments is now through contactless methods. In addition to improving the experience, it will provide a secure method of payment. Travel and tourism companies can offer online tourist passes, QR code menus (in

hotels, airports, restaurants, etc.), hotel check-ins, contact tracing (for their benefit), portals for travel-related information, picture QR code landmarks, and more with touchless or contactless transactions. Right now, everything is available online. In essence, QR codes, also known as Quick Response codes, are a kind of two-dimensional barcode that can be scanned by smartphones and online apps. They are a commonly used tool to enhance customer satisfaction in the service business, particularly in the travel and tourism sector. The quantity of data that conventional QR codes hold or exchange sets them apart from barcodes. Old-style bar codes have one-dimensional long lines as shown in Figure 1. and can store only 20 digits, while two-dimensional QR codes can store data with thousands of alphanumeric characters.



Figure 1 – Example of Traditional (Old-style) Barcode. Source – Created by Researchers

The basic building blocks of QR code recognition consisting of numerous indicators and markers are shown in Figure 2. QR codes are created simply by using popular QR code generator software on the internet.



Figure 2 – Example of Basic building blocks of QR code recognition. Source – Created by Researchers

Despite being created in 1994 for industrial usage by the Japanese firm Denso Wave, QR codes have grown acceptance in 2011 as a means of product packaging and promotion (Brabazon, T. et al., 2014; Fino E. R. et al., 2013). In order to encode text or URLs (Uniform Resource Locators) that lead to web pages or other data, a QR code is composed of square black modules set against a white backdrop. One of the world's most fascinating sectors is that of travel and tourism. Furthermore, travel and tourism may be made more dynamic and interesting by utilising QR Codes. The use of 2D barcodes is not constrained by time or technology. The integration of Internet technology and terminal technology facilitates the extensive use of 2D barcodes and advances technological advancements and innovation (Rathee G. et.al 2019 & Rathee G. et.al 2019). A seamless, frictionless experience is being promoted by this digital concierge. With QR codes, travellers and hotel guests have more options and don't have to worry about running out of cash or paper tickets. A QR code can include text, a phone number, an SMS message, a URL, or a V-card. They can be swiftly deciphered, which is why they are

called QR codes. Using the camera of a smartphone, it is an instantaneously readable image that can be scanned by a machine.

In actuality, users may connect electronically when QR codes are put on tangible objects like posters, handouts, or any other object. The selection of a QR code type is contingent upon the particular application and the information that the organisation or company want to disseminate to its user base. QR codes come in a variety of formats and types.

1. Static QR codes are simple QR codes with fixed, immutable data inside. They are frequently utilised for basic applications such as contact details, internet URLs, or plain text. Static QR codes have the benefit of being simple to create and requiring no continuous upkeep because the data is pre-fixed to guarantee consistency for users.
2. Conversely, Dynamic QR codes have the ability to hold data that is editable or dynamic. Once the QR code is produced, the encoded data may be modified or altered. They are frequently utilised in ticketing, marketing campaigns, and applications where the material must be updated periodically. Updates to the data that the QR code links to must be flexible. Dynamic QR codes allow content or destinations to be changed without altering the physical code; this is advantageous for information that is time-sensitive or subject to change, such as digital menus for restaurants that can be updated with daily specials or price adjustments, inventory tracking, or dynamic information displayed on packaging.

Depending on their unique use cases, the travel and tourism sector frequently uses both static and dynamic QR codes; nevertheless, they always make sure the information is well-designed, user-friendly, and offers a satisfying experience for the visitor or tourists.

Review of Literature

These days, one just need to scan anything; the days of struggling with maps and booklets are long gone. In short, travel is being revolutionised by QR Codes. They make journey discovery simpler, more instructive, and more pleasurable (Saumya May 2025, Scanova Blog). The exponential expansion of QR codes over time has been caused by the widespread use of smartphones, growing digitisation, and technical improvements. Consequently, it has been predicted that beginning in 2027, QR codes would take the role of barcodes (Roselle V. 2025), with 9.3% of all QR code scans worldwide, India ranks second in the world for QR code creation. Compared to US scans, that is a 32.9% difference. The current number represents a huge 1,101,723 scans by Indian consumers, a 3.30% increase from the previous year.

With the QR Codes, which are transforming luggage monitoring (Getbacklost, April 2024), one can travel smarter—not harder! In recent decades, the tourist industry has seen a change because to technological advancements and solutions like gamification, mobile devices, RFID, and the Internet of Things (IoT) (Buhalis, 2020). Over time, digitalization has increased dramatically (Ritter & Pedersen, 2020), and tourism organisations are using it more and more to produce value (Amit & Han, 2017). Even in heritage towns, it entails leveraging digital technology to conduct more lucrative and efficient operations (Hadjeliassa et al., 2022). As QR code trends have developed over the years, it has been seen an unheard-of rise in new applications that cut across sectors and transformed daily operations. It's interesting to note that, while being created in 1994, QR codes never lived up to their full potential prior to the COVID outbreak. The global switch to contactless technology brought about by the COVID-19 epidemic is largely

responsible for their comeback in popularity. For information transfer, people have become accustomed to scanning codes due to their speed, ease, and safety. By enabling quick and easy access to a wide range of materials, QR codes are generally helping the travel, tourist, and hotel industries improve the guest experience. The future of the business looks bright as QR codes continue to develop the visitor experience and streamline operations. The epidemic had a significant role in the development of QR codes, which are now a necessary tool for touchless transactions. Digital menus, contact tracking for individuals in public spaces, and payment via QR codes were all available. In addition to cultural heritage and attraction locations, "QR codes" have been utilised by the tourist, hospitality, and aviation sectors. For example, museums utilise "QR codes" to identify exhibits that guests may scan for information, and some airlines have switched to storing boarding card data as "QR codes" (Rouby I.). According to a study by Madhusudan (2022), the usage of QR codes for marketing is growing. On mobile devices, the imbedded information may be read. According to (Bellary, 2018), using a QR code and the built-in QR scanners on smartphones makes accessing information simpler. Users do not have to commit the important web addresses to memory. Code generators may be used to create "QR codes," which can then be deciphered using downloaded scanning apps or smartphone cameras. The schemes are decoded by the reader application software, which then transforms them into legible text and figures. The user can connect to internet data or receive direct data via the decoded codes. The vast amount of information that QR Code tags can hold, their quick reading speed, and—most importantly—their ability to read data from smartphones and tablets have led to a far greater number of applications (Fotiadis, D. et al., 2021). Pillai et al. (2017) conducted a review article that examined the diverse applications of "QR codes" in the tourist sector throughout the world. The findings demonstrate that "QR codes" offered a number of benefits, including convenience of use and the ability to get over language hurdles. However, obstacles including ignorance and poor internet access in some regions of the world limited the use of "QR codes." In order to investigate why "QR codes" are used on magazine commercials, Ertekin et al. (2014) carried out a study in the US. The findings demonstrated that customers might be persuaded to scan "QR codes" if doing so was connected to promotions and entertainment. In order to learn more about the items and read customer reviews, the respondents also indicated that they would be interested in skimming the advertisements. In an effort to increase tourism at its well-known tourist destination, Fort Kochi, one Indian state, Kerala, launched an e-guide aided by QR codes in 2022. This guide provides visitors with pertinent information, such as the location of the closest bus stop, train station, and airport, the operating hours of the terminus, and its phone number. In contrast, Mahabaleshwar in Maharashtra flung the Go-Mahabaleshwar microsite in 2022, which aims to enable local service providers to run businesses independently of intermediaries. The town's travel-tourism ecosystem will be able to utilise a single QR code thanks to it (Dar V. Financial Express, July 2022). Singapore is introducing a new system that enables drivers entering the nation through two land checkpoints to utilise a QR code instead of traditional passports in an effort to expedite border crossings and shorten wait times (As published in The Economic Times, March 2024). The country's Immigration & Checkpoints Authority declared that, as of March 19, passengers passing through the Woodlands and Tuas checkpoints can generate a single QR code in advance of their arrival. This will streamline the clearance procedure for all passengers in the car and cut down on wait times by thirty percent. The habit of QR codes has expanded dramatically in

the last several years due to the extensive use of mobile devices in a variety of industries, including retail, restaurants, logistics, commerce, and tourism (Jong-Hyuok et al., 2012; Okazaki et al., 2011; Ozkaya et al., 2015; Rotsios et al., 2022; Sang Ryu and Murdock, 2013). Travel and tourism may assist from the use of QR Codes, particularly when it comes to showcasing ideal vacation spots and activities. Get ideas for QR Codes from these sources so that your travel agency, tour operator, or tourist information centre may offer the best possible customer service and encourage feedback from their clients. To ensure that these digital tools stay relevant and beneficial for both visitors and tourism operators, it is imperative to consistently explore innovative uses and adhere to best practices in QR code utilisation (Alachi A., 2024). Furthermore, QR codes are a very useful tool for both travellers and travel agencies since they save wait times, do away with the need for paper maps, brochures, and physical cards, and promote environmentally friendly travel methods. Security precautions are being taken to protect personal data as QR codes are used more often in travel. Travel agencies are following stringent data protection standards and taking precautions to preserve the secrecy of consumer data obtained through QR codes. In order to minimise the danger of data breaches, QR code technology is always developing to solve security issues. To lower the danger of malware or phishing attempts, users are advised to scan QR codes using reputable scanner software. The tourism sector is collaborating to increase public knowledge of safe QR code usage standards (Line M. 2023).

Methodology

To comprehend the idea and use of QR code technology in the travel and tourist business, a systematic literature review, or SLR, is being conducted. The information is collected through secondary sources through: (i) Travel, Tourism, and hospitality books which are a great resource for obtaining secondary data for research, in any industry; (ii) Journal articles: because they provide in-depth discussion and analysis on a certain topic or issue, these may be highly valuable for acquiring secondary data for research; (iii) Online databases, blogs, and websites may also be highly useful for obtaining secondary material for research; (iv) Articles from newspapers and magazines that provide commentary, explanation, or analysis of any location can also be utilised as secondary sources. These secondary sources can offer insightful background and analysis that can serve to update and support study findings, making them an essential tool for researchers.

QR Codes in Travel and Tourism Industry

Below are some pointers that can prove how QR codes are taking the travel, tourism and hospitality industry forward:

- A lack of easily accessible feedback sites and hectic schedules can make it difficult to properly capture consumer comments. Thankfully, QR codes streamline the process of gathering feedback and encourage users to share their thoughts.
- Contactless access validation systems are a common feature of facility management systems (hotels, gyms, resorts, etc.). This makes it possible to discard cards, fingerprint readers, and keys.
- Visiting a new location or nation can frequently leave travellers feeling anxious and perplexed. However, in addition to providing addresses and places, QR codes now

include special features like language assistance for city tours, maps, and history excursions. This allows workers or service providers to concentrate more on interpersonal communication for other goals.

- Using augmented reality to enable virtual travel is one fruit that one must try. And how come QR codes are ever a possibility? Therefore, one may still take a few hours of respite online even if they are unable to afford to travel elsewhere.
- Because QR code technology automatically records important data, it may aid in logistics maintenance more effectively. This is a crucial task since it allows travel agencies, lodging facilities, and other businesses the chance to develop and adapt by analysing data to determine what works and what doesn't.
- Touchless and simple transactions may be made with little difficulty by using QR codes in lifts and payment websites (such as Google Pay, Paytm, and others).
- Ensuring safety should always be the first priority when travelling. Fortunately, using Google Maps QR codes can help make traveller security better. Travellers may easily obtain important information like emergency contact numbers, hospital locations, and safety instructions by scanning a QR code at hotels or tourist information centres.
- A complete catalogue is costly to produce, and to make matters worse, it must be updated frequently to reflect the most recent pricing and trends. Customers may be certain that they are always informed and that this issue won't come up thanks to the QR code. They get complete access to all of the trip options, including availability and costs, with just a single scan.
- Simplifying the decision-making process for consumers by providing a preview of the tour with a video QR Code that displays promotional materials and allows clients to quickly and easily scan the code to obtain an immersive experience of their forthcoming trip.
- Finally, since this technology is environmentally benign and does away with the need for printed tickets, boarding cards, etc., it is at least helping to achieve the aim of saving paper.

The other uses or assistance of QR Code technology in travel and tourism industry are shown below in (Figure 3):

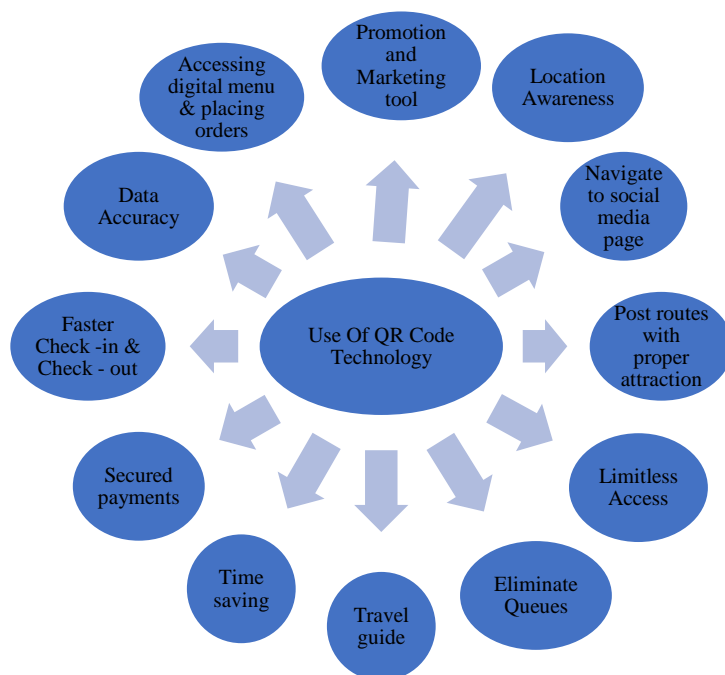


Figure 3: Use of QR Code technology in travel and tourism industry (Source: Researchers)

Travelling to new places is a great way for many individuals to unwind, spend time with loved ones, discover new things, and many other benefits. Owners of tourism-related businesses must thus seek out fresh, interesting, and modern concepts. Because of this, an increasing number of tour operators, travel agencies, proprietors of hotels and restaurants, curators of museums and art galleries, and other tourism-related organisations are utilising dynamic QR codes and QR code generators. They can support the company's substantial expansion in addition to helping it stay solvent.

Where to Place QR Codes?

The tourism marketers or travel agencies should know where exactly should QR codes in the travel and tourism industry is properly utilized. The opportunities are endless, but some common implementations are as follows:

Feedback gathering: It's not always simple to persuade a consumer to leave a review. To increase the likelihood of receiving another favourable review, feedback QR codes should be placed on labels, receipts, and inside or outside of tour vehicles.

Improving Road Signage QR code may be used to direct a visitor to a specific location on Google Maps, such as your place of business or a meeting place. Entering an address is not necessary; simply scan it.

Access to Local Attractions: Using QR codes has made it easier for travellers to find local attractions. By providing travellers with convenient access to important information, using QR codes in Google Maps improves the overall experience of travelling.

Social media: A consumer might be directed to a Facebook or Instagram profile by using QR codes in a stunning graphic design. A single scan yields an abundance of followers.

Acquire the customers: Advertising discounts or special deals that drive viewers to a certain website is one way to get new customers.

App Download: Boost the number of app downloads by creating a QR code-based download link. An excellent place to start would be by writing these scripts on counters or in windows.

Email and SMS marketing: To help promote special discounts or events, one have to do is add a QR code to an email or text message.

Payments: Adding a QR code to the product or checkout area can securely enhance transaction rates. Contactless payments are frequently favoured.

Wireless network connections: Rather of having to write down and remember the network name and password, think about putting a QR code at the hotel, workplace, or other Wi-Fi facility so that guests can use their smartphones to scan it and connect to the network right away.

Add to calendar events: Provide a QR code in the email confirmation to customers to help them avoid missing tours once they have made a reservation. Customers may even choose to indicate the meeting place when asked whether they would want to add the event to their calendar.

QR Codes for Immersive Experiences

With so many advantages for tourists and travel agencies alike, QR Codes have become a game changer for the travel business. These days, an extensive choice of useful applications in the travel and tourist industry, such as contactless ticketing, reservations, interactive maps, navigation, tour information, audio tours, real-time updates, or multilingual assistance, are made possible by the adaptability of QR codes. In general, QR codes have developed into a very useful tool for the travel and tourism sector, promoting and improving the traveller experience.

Conclusion

QR codes have developed as a key tool in the field of international travel and tourism, revolutionising the way places communicate with travellers. The two most intertwined aspects of contemporary life are technology and tourism. In a constantly evolving digital and physical environment, using this technology to reach broad consumers is the essence of a contactless and seamless experience. In the wake of the COVID-19 epidemic, QR codes have become a well-liked and long-lasting solution for the travel and tourism sector. An important step towards environmental sustainability has also been made with the introduction of QR codes in the travel and tourism sector. Destinations may contribute to conservation efforts and encourage a greener travel strategy by drastically reducing their use of paper by eliminating the need for printed guides, maps, and brochures. By these useful uses, QR codes not only improve the guest experience but also encourage the travel sector to adopt more sustainable, knowledgeable, and personalised procedures. QR code-based social media interaction is also becoming more popular. QR codes are being used by businesses and destinations to link travellers to their social media accounts, enabling them to instantly share their experiences, images, and reviews. In addition to increasing the location's internet visibility, this fosters a community of travellers who exchange travelogues. These creative applications of QR codes show how they have the power to completely transform the travel and tourism sector.

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