

## QR Code Menus: Exploring the Role of QR Codes in Enhancing Operational Efficiency and Customer Engagement in Restaurants and Cafes

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### Abstract

*Many of the industries need to adopt digital technologies to improve the overall activity. The hospitality industry is no exception, one of the means which enables the businesses to enhance their services and the interaction with customers is the use of QR codes. The purpose of the article was to explore the effects of the QR codes adoption in the activities of restaurants and cafes, emphasizing its important role in improving operational processes. The research performed among various restaurant and cafes owners, using semi-structured interviews, investigated how the QR codes were integrated in the day-to-day activity and the perceived impact. Furthermore, it explored the benefits, challenges and the plans for using this technology. The results provided a detailed analysis on how the QR codes were integrated, offering useful insights on how digital tools are improving businesses and the relationship with the customers.*

**Key words:** QR codes, hospitality industry, digital menus, restaurants, cafes

**J.E.L. classification:** M31, L81, L83, L86

### 1. Introduction

The hospitality industry, particularly within the HORECA sector (Hotels, Restaurants, Cafes), has significantly transformed by integrating QR codes. The widespread adoption of QR codes has been driven by the demand for efficient, contactless interactions, a need that has grown increasingly important during the COVID-19 pandemic. Numerous services, such as digital menus, self-service ordering, payment processing, and gathering customer feedback, are made possible by QR codes. By using QR codes businesses were able to reduce physical contact, simplify procedures, and improve customer support. QR codes have revolutionized the hospitality industry's functions, creating a safer and more convenient experience for customers and staff (Ozturkcan et al, 2023, p.1).

The hospitality sector saw a dramatic digital transformation as a result of the COVID-19 pandemic. Minimal physical contact was mandated by health guidelines, and businesses needed to use QR codes to continue operating while adhering to safety regulations. QR codes have been used for contactless menus, allowing customers to view options on their mobile devices without touching physical menus.

According to Gursoy et al. (2020, p.528), QR code menus emerged as the most frequently utilized option in restaurants during COVID-19. These digital menus have continued to be popular even in the post-pandemic era. Restaurants were a part of the service industry adapting to the COVID-19 pandemic by changing business practices and physical spaces. Some of these adjustments involved reducing the number of customers allowed in the restaurant, using digital menus, providing more outdoor dining options, and offering contactless payment methods (Taylor, 2020, p.7). Iskender et al. (2022, p.1) researched restaurant customers' behavioural intentions using QR code menus during the pandemic. Trialability and hygiene, two contextual factors that are frequently disregarded in

conventional technology acceptance models, were included in their study. When it came to forecasting customers' behavioural intentions, their model performed better than the conventional models.

Among other industries, the hospitality industry has seen an increase in technology use as a consequence of the COVID-19 pandemic. The primary driver of this adoption was the need to adapt to new safety standards, maintain operational continuity, and meet changing consumer preferences, all within the constraints imposed by the pandemic (Ameen et al, 2021).

The purpose of this study is to investigate how QR code technology is being adopted and used in the hospitality sector. The primary focus was on how customer interactions and the effectiveness of service in cafes and restaurants have been affected by QR code menus.

The paper is structured as follows: an introduction to digital technologies, specifically QR codes, in the hospitality sector and a detailed description of the research methodology. Then twenty café and restaurant owners' in-depth interviews were examined, where they talk about why they adopted QR codes, the advantages they've noticed, and the challenges they've faced. The paper ends with a discussion on how these findings could impact the hospitality industry.

## **2. Literature review**

### **2.1 QR codes**

A QR Code (Quick Response Code) is a two-dimensional matrix barcode created by a Japanese company, Denso Wave. This barcode format can encode information in both horizontal and vertical directions. Initially developed to track vehicle parts during the manufacturing process in the automotive industry, QR codes have a much larger storage capacity than traditional barcodes (Mishra et al, 2017, p.17).

According to Davies et al. (2023, p.1131), a Quick Response (QR) code is a two-dimensional barcode that consists of a square grid of black and white pixels. It can be scanned by digital devices, such as smartphones or cameras, to retrieve encoded information, such as a website URL, contact details, or payment information. QR codes became popular during COVID-19, and they are likely to continue being used because they're so handy for things like marketing, tickets, and paying without touching anything.

QR codes aren't just for factories anymore. Now they are very important for talking to people online and getting customers interested in products or services. This evolution was spurred by the widespread adoption of smartphones, allowing consumers to access digital content linked through QR codes instantly. QR codes are being utilized by numerous number of industries to improve customer experience. For example, shops use them on product packages to provide more information or special deals, making it easier to shop online and in-store simultaneously; museums use QR codes to give visitors cool tours and information about exhibits, making trips more educational and interesting.

### **2.2 QR codes in hospitality**

Companies nowadays feel pressured to use technology to make things better. With technology growing fast and the economy focusing more on knowledge, it's no surprise. Customers now have access to more information than ever before, thanks to technology. They use this information to help them decide what to buy.

Albăstroiu et al. (2015, p.564) note that QR codes provide instant access to a range of data via mobile devices, including website URLs, email addresses, phone numbers, and geographical coordinates.

Nowadays, QR codes are considered a smart choice for hotels looking to improve their sustainability. By simply putting QR codes around, like in the lobby, rooms, and public spots, hotels offer guests a convenient experience. QR codes mean less need for printed materials and let guests quickly see things like menus and room service options. This makes QR codes effective for promoting sustainability in the hospitality industry while improving the overall guest experience (Touch Menu App, 2023).

QR codes have been a staple in the hospitality industry for a considerable time. QR codes are now commonly used in hotels, restaurants, and cafes. Initially, they were primarily used to access digital content quickly. Nowadays, QR codes are used for several purposes in the hospitality industry. These codes not only streamline menu access, room selection, and payment transactions but also play a pivotal role in improving the overall customer experience and optimizing business operations (Finedine Menu, 2023).

### 2.3 QR codes in menus

The dining experience in table-service restaurants has been revolutionised by QR codes. With the help of these codes, customers can place their meal orders and make payments without interacting with servers. The table number is contained in the QR code, which makes it easier for servers to deliver food to the right table. Throughout the pandemic, businesses have promptly adopted QR code menus as a modern trend, placing the safety of their patrons at the forefront. A QR code menu empowers customers to access a digital menu directly on their smartphones with a mere scan. The best part is that virtually all mobile devices can scan QR codes, enabling patrons to swiftly point their devices at the QR code and be instantly directed to a contactless menu, ensuring a secure dining experience (Can, 2021, p.211).

Restaurant menus are crucial to a restaurant's success because they serve as a marketing tool to present its offerings to customers (Dennis, 2023). The restaurant industry is labour-intensive and complex, and it must continually adapt to changing trends to remain competitive and avoid stagnation (Can, 2021, p.216). QR-coded menus are a modern alternative to traditional printed menus.

QR code applications play a vital role in restaurants. They provide a mobile marketing platform for customers to access menu information and additional marketing communications. This approach is particularly beneficial for food and beverage establishments, as setting up and managing QR codes is more accessible and cost-effective than traditional printed menus (Kiliç et al, 2023, p.1059).

Restaurants increasingly adopt QR codes to offer guests a more convenient and contactless dining experience. These codes can be placed at the entrance or on tables, allowing customers to scan and access an online menu or be redirected to an online ordering platform or app. Doing so allows them to easily place orders and make payments independently without interacting with a cashier or server. Moreover, QR codes can also provide links to daily or weekly specials that might not be listed on standard printed menus. Restaurants can now easily keep their customers updated on their menu offerings without the hassle of printing new copies all the time. QR codes offer restaurants a practical and innovative solution to improve customers' experience, save costs, and increase efficiency (Modern Restaurant Management, 2020).

Restaurants can make dining a better customer experience and smoother for operations with QR codes. Restaurants that go digital can learn more about their customers' preferences and tailor their dining experiences for them.

### 2.4 QR codes menus advantages

The use of QR codes has significantly increased due to the recent pandemic. In order to prevent customers from touching surfaces and to facilitate secure transactions and communication, hotels and restaurants started to utilize QR codes. In response to the rising demand for touchless interactions from customers, these changes were implemented. While paper menus have made a comeback, the use of QR codes has continued even after the pandemic. QR codes are still used today because they are adaptable and practical in various areas (DXglobal, 2023). For restaurants and cafes, using QR codes in menus has been really helpful for business owners, especially during the pandemic. This shows how valuable and current they are even after all these years. Customers were now able to interact more easily and safely.

Here are the primary benefits noted from the perspective of restaurant and cafe owners:

- *Enhanced customer safety*  
QR codes have become essential for minimizing physical contact by replacing traditional paper menus with digital alternatives.

- *Long-term financial benefits*  
Adopting QR code menus is a strategic move that can lead to substantial cost savings over time. With digital menus, updating menu items is quick and easy, without the need for frequent reprinting. Significant cost savings and increased business flexibility may result from this.
- *Operational efficiency*  
QR codes streamline the ordering process. Customers can scan the code, view the menu, and sometimes even place an order without waiting for a server. This efficiency not only speeds up the service but also reduces the workload on staff, allowing them to focus on enhancing customer service elsewhere (Lingaros, 2023).
- *Data collection and analytics*  
Digital menus linked to QR codes allow restaurant owners to collect valuable data on customer preferences and ordering patterns. With the use of this data, menu options, price policies, and marketing campaigns can all be better tailored to the needs of the target audience.
- *Environmental benefits*  
QR codes contribute to an establishment’s sustainability efforts by reducing the need for paper-based menus. Digital menus decrease the amount of waste produced, aligning with the growing consumer preference for environmentally responsible businesses (Iskender et al, 2023, p. 595).
- *Improved customer experience*  
QR code menus often enhance the dining experience by integrating features such as dish recommendations, ingredient sourcing information, and interactive elements like video preparation of meals. These features can help educate customers about their food and create a more engaging dining experience (Touch Menu App, 2023).
- *Flexibility and agility*  
The ability to quickly change menu items, prices, or descriptions based on inventory levels, special promotions, or customer feedback provides agility that is difficult to achieve with printed menus. This adaptability can be particularly valuable in responding to changes in supply chain availability or special events (Mildred et al, 2023, p.75).

In the hospitality industry, QR codes have been a considerable improvement. With the help of this technology, professionals can increase operational effectiveness, succeed in a market that is continuously changing, and more effectively adjust to the constantly evolving requirements of their guests. It’s not just a technological trend but a decision that can lead to long-term success in the competitive world of hospitality.

### **3. Research methodology**

To carry out the research a detailed methodology was used, involving in-depth interviews which gathered the restaurant and cafes owners’ perceptions and experiences about the adoption and use of QR codes. In-depth interviews are a qualitative research method commonly used to gather comprehensive information from a specific group of participants. These interviews use open-ended questions to promote a conversational and exploratory communication style (Boyce et al, 2006, p.3). This technique is used to explore the interviewed persons attitudes and viewpoints on a specific topic.

The purpose of the investigation on how the QR codes are integrated and used in the current activity of restaurants and cafes, was to provide a profound understanding of the impact this technology has in the HORECA sector.

The semi-structured interview process follows a multi-stage design:

#### **1. Planning the research and selecting participants.**

The first stage comprised in defining the scope and objectives of the research, focusing mainly in how QR codes are used in the daily activity and regarding customer interactions. It involves researching a carefully selected group of 20 restaurant and cafe owners from Brasov, Romania, chosen to represent a diverse range of businesses within the HORECA sector, encompassing various types and sizes.

## 2. Interview guide creation

The interview guide, a key tool in this study, is meticulously crafted to elicit rich, detailed participant narratives. A predefined set of interview questions steered the conversations, although participants were encouraged to express their views freely in their own words. The advantages, disadvantages and implications of QR codes were covered during the interview.

## 3. Conducting the interviews

Semi-structured in-depth interviews were carried out on the Zoom platform during January 2024. During the data collection process, the researchers followed ethical guidelines to ensure informed consent, protect the privacy and confidentiality of the data, and manage the data responsibly.

## 4. Data collection and analysis

A thorough data analysis was undertaken. All notes and answers recorded during the interviews were subjected to a thorough review and refinement process. All the data obtained was carefully arranged in order to reflect the goals and inquiries of the study and make it easier to draw insightful conclusions.

## 5. Interpretation

This step was crucial as it allowed for presenting the main findings based on the insights gained from the data. The process allowed the reach of the objectives and provided important answers at the research questions.

Here are the objectives of the current research:

### *O1: Implementation and motivation*

This objective aims to document the reasons behind adopting QR code technology in business operations. It aims to find out the start point of QR code implementation and identify the main reasons of this integration.

### *O2: Usage in operations*

This objective thoroughly examines the use of QR codes in daily business operations.

### *O3: Benefits and challenges*

This objective evaluates the dual aspects of benefits gained and challenges faced from using QR codes.

### *O4: Customer response and experience impact*

This objective assesses how customers have reacted to the implementation of QR codes and how these reactions translate into changes in customer experience.

### *O5: Future directions*

Finding out whether companies intend to use QR codes in the same way or in different ways, as well as the rationale behind these choices, is the main goal.

Based on these objectives the entire research project could be finished.

## 4. Findings

To ensure logical presentation and alignment with study objectives, we have organized the main findings by each objective.

### *O1: Implementation and motivation*

Restaurant and cafe owners reported implementing QR codes at the beginning of the COVID-19 pandemic in response to health guidelines and customer safety concerns.

Most respondents indicated their primary motivation was to minimize physical contact to ensure customer and staff safety. Beyond the immediate health benefits, many owners recognized the potential of QR codes to sustain operations amidst restrictions on physical interactions. Many owners decided to use QR codes after seeing how well they worked in other industries and within the hospitality industry. Using QR codes was essential for some businesses to continue operating during lockdowns and social distancing orders. They noticed the operational benefits and how readily customers accepted the technology.

Numerous respondents said the efficacy and versatility of QR codes were the main deciding factors in their selection of resources because they felt these tools would meet their immediate needs and complement their long-term business plans. The decision to implement QR code technology was predominantly a tactical response to unprecedented external pressures. However, for the majority of respondents, it also marked a significant strategic shift within the sector; businesses were not merely

reacting to short-term challenges but were also proactively seizing an opportunity to innovate and enhance their resilience against future disruptions.

Many business owners have started using QR codes to provide a blend of traditional and digital services.

#### *O2: Usage in operations*

Respondents reported employing QR codes across various applications within their operations. Most respondents have integrated these codes primarily to access digital menus, facilitate contactless ordering, and execute seamless payment transactions. Numerous participants have reported that incorporating QR codes into their incentive schemes has enhanced customer involvement and retention percentages. Moreover, a few businesses have effectively utilized QR codes for their promotional activities.

On the operational side, most owners utilize QR codes for efficient inventory management. By scanning a code, staff can instantly update inventory data or trigger supply orders, integrating real-time data flow into their systems. Furthermore, a lot of business owners recognise how useful QR codes are for getting fast feedback from clients. This feedback mechanism is often structured to provide insights shortly after dining, allowing for swift operational or menu adjustments based on customer satisfaction metrics.

According to the majority of respondents, QR codes improve service delivery responsiveness and streamline management tasks.

#### *O3: Benefits and challenges*

Many restaurant and cafe owners reported significant benefits from implementing QR codes, primarily citing increased operational efficiency as a significant advantage. Faster order processing and shorter customer wait times were examples of this efficiency in action. Additionally, a substantial reduction in costs associated with printing and updating paper menus was highlighted, along with enhanced customer safety through minimized physical contact. On the other hand, several challenges were also noted. The most common issue mentioned by many respondents was initial customer resistance, especially among older demographics who needed to be more accustomed to digital technology. One of the other challenges was the sporadic requirement for technical support, like resolving software problems or guaranteeing that every customer had a device that could read the QR codes.

The majority of owners discovered that encouraging employees to use QR codes and being proactive in communicating with them helped allay some of these worries, thereby empowering both staff and clients.

Furthermore, addressing the technical challenges associated with QR code implementation required some establishments to invest in staff training and occasionally in technical support to ensure a seamless customer experience.

The overall sentiment among most respondents is that while adopting QR codes involves an upfront adjustment and ongoing management of technology, the long-term benefits - such as cost savings, improved efficiency, and enhanced safety - significantly outweigh the initial challenges.

#### *O4: Customer response and experience impact*

According to most restaurant and cafe owners, customer feedback on QR codes has been overwhelmingly positive. Many customers have expressed satisfaction with the efficiency and speed of service facilitated by QR code menus, appreciating the immediate access to menus and the ability to place orders directly from their smartphones. The improved interactive elements of digital menus - like thorough dish descriptions, photos, and occasionally even videos - have greatly improved the eating experience. Nevertheless, there has been a noticeable preference for traditional paper menus among some customer base segments, particularly older customers, who find digital menus less accessible or more challenging to navigate.

QR technology adoption has improved consumers' experiences in cafes or restaurants. The predominantly positive feedback from customers suggests that QR codes align well with contemporary expectations for convenience and efficiency in dining experiences.

The importance of adopting a hybrid strategy - maintaining both traditional menu options and menus enhanced with QR codes - is highlighted by this client feedback. With a strategy like this, businesses can effectively serve all customers, regardless of their technological proficiency and preferences.

#### *O5: Future directions*

Unanimously, the restaurant and cafe owners indicated their plans to continue using QR codes and expand their capabilities within their establishments. Nowadays, restaurant and cafe owners are using advanced technologies like augmented reality (AR) in order to create interactive menus and virtual food presentations. Coupled with this, there's a strong interest in utilizing data analytics from QR code usage to tailor marketing strategies and menu offerings more precisely based on customer behaviour and preferences. QR codes are seen not just as a temporary measure but as a versatile tool that will evolve alongside their businesses and the broader industry.

According to the findings QR codes are more than just a pandemic response. QR codes are seen as a key component in the hospitality industry. Initially adopted for contactless interactions, their use has expanded to improve service efficiency and reduce operational costs. Despite initial resistance and technological learning curves, the industry has embraced QR codes enthusiastically. Looking forward, innovations like augmented reality and targeted data analytics are poised to further enhance customer engagement.

## **5. Conclusions**

Since their invention, QR codes have come a long way. QR codes have become popular, being used in all sorts of commercial tracking and mobile tagging applications. QR codes can display text, open web pages, add contact details to a user's device, connect to a wireless network, or even compose emails and text messages. As of 2024, QR codes have become an integral part of our daily lives, serving as a quick and efficient way to access information and connect with others (Wikipedia, 2024).

The hospitality industry undergoes accelerated transformation which is enabled by innovations in the digital field, such as QR codes. Originally adopted to meet the demand for safer, contactless services during the pandemic, QR codes have become crucial for modernizing restaurant and cafe operations. The possibility to have access to the menu as soon as you sit down at the table, to be able to view the dishes you order and even to benefit from certain discounts following the use of QR codes, are just some of the main advantages that these codes offer.

The frequent use of QR codes in the hospitality industry opens a path to an interactive and precise business practice. Owners are now looking towards future enhancements such as augmented reality in menus and more precisely targeted marketing through data analysis, showing a commitment to leveraging technology to meet changing consumer demands. The switch to digital solutions, like QR codes, is not without its difficulties, though. However, despite all the challenges, the industry has embraced QR code technology.

The future of the hospitality sector could be greatly influenced by QR codes. It is essential for the sector to adopt these digital technologies in order to boost customer satisfaction and keep up with the evolving market. It is also advantageous to do so. In an increasingly digital world - where QR codes are leading the way - the hospitality industry can maintain its competitiveness and satisfy customer demands by continuously adopting and integrating new technologies.

The qualitative technique used in the research constitutes one of the limitations, as the results cannot be extrapolated at general population level. The information discovered offers an overview of the use of QR codes which can be helpful especially for those who want to use QR codes in their activity, this can be a starting point.

This paper highlights the importance of adapting to technology and focusing on customer needs. It examines how consumer preferences, operational requirements, and technological advancements shape the future of the hospitality industry. The paper specifically looks at the role of QR codes in revolutionizing hospitality operations and improving customer interactions. It provides important insights for businesses aiming to succeed in the digital age.

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