

QR Code Information at Metro Stations: Creating Convenience and Access to Information for Passengers

Qodirov Ravshan Lazizjon o'g'li

Head of the "Modern Information Technologies Implementation" Department at the Scientific Innovation Center for Metropolitan Personnel Training of the "Tashkent Metro" State Unitary Enterprise (SUE)

Abstract: This article explores the possibilities of creating convenience and obtaining information for passengers by introducing QR code technology in the subway. Through the use of QR codes, passengers are provided with quick information about the history of subway stations, timetables, exits and additional services. Using modern technologies, this project will save passengers' time, increase the convenience of using the transport system, and develop urban tourism. Technical possibilities and limitations are also considered.

Keywords: QR code, subway, transport system, convenience for passengers, subway routes, safety, tourism.

Introduction

QR code technology is widely used in many sectors today, including transportation systems. This technology provides a convenient and fast way to deliver necessary information to passengers. The introduction of QR code information at metro stations offers an opportunity to increase convenience by providing passengers with essential information about the history of metro stations, schedules, exit points, and additional services. The relevance of the project lies in the fact that modern technologies and information systems are of great importance in meeting passenger needs, saving their time, and improving the convenience of using the transportation system.

Materials.

Main Body General Information about QR Code Technolog

A QR code (Quick Response code) is a two-dimensional matrix or barcode that encodes large amounts of data. It was created in 1994 by the Japanese company Denso Wave. Its key feature is its speed and ability to encode a large volume of information compared to regular barcodes. A QR code can easily be scanned using a smartphone or tablet. The use of QR codes in transportation systems allows for fast access to information and increases efficiency.\

Research and methods.

History of Metro Stations

In this project, a special QR code will be developed for each metro station. Passengers can scan this code to learn about the history of the station. For example, information will be provided about the station's opening date, architectural achievements, materials used in construction, and

unique art pieces present at the station. This information will spark interest in the city's history and the development of the metro system, especially for tourists who may find it fascinating.

Movement Schedules and Metro Routes

A QR code will provide the ability to receive real-time metro schedules, which will help passengers get information about train intervals and arrival times. Passengers will also receive real-time notifications about trains approaching their station. This will help optimize their travel time and reduce the number of passengers waiting at the stations. Additionally, QR codes can provide information about all metro routes and their arrival times at different stations.

Information about Station Exits

Metro stations often have multiple exits, each leading to different areas. By scanning a QR code, passengers will be able to find out about the location of the exits, nearby attractions, shopping centers, parks, public transport stations, and other infrastructures. This information will be especially helpful for passengers who are unfamiliar with the station and need assistance in finding the right direction.

Results.

Additional Information About Services at Metro Stations

The project will also provide passengers with the opportunity to access information about the following services:

- **Waiting Areas and Amenities:** Passengers can learn about the locations of waiting areas, information panels, seating, and direction indicators, allowing them to make the most of the services available at the station.
- **Assistance Services and Information Desks:** Through the QR code, passengers will be able to find the location of assistance services, information desks, security services, and help centers at the station.
- **Safety and Movement Convenience:** Passengers can access information about safety measures, such as the location of surveillance cameras, security personnel, and safety protocols in place for passengers' protection.
- **Information on Escalators and Elevators:** The QR code will provide information about the location of escalators and elevators at each station, improving passenger movement within the station.

Discussion.

Practical Aspects and Benefits of QR Codes

There are several significant practical aspects and advantages to implementing QR code technology in the metro:

- **Convenience for Passengers:** Passengers can easily access full and quick information about metro stations using their smartphones. The QR code technology makes this process much easier and more convenient. Passengers will be able to identify metro routes, easily find exits, and learn about the history of the stations.
- **Contributing to Tourism Development:** QR codes at metro stations will provide fascinating information about the city's history and culture, which will spark the interest of tourists. This will allow the metro system to be showcased as a tourist attraction linked to the city's history.
- **Updates on Safety and Services:** The ability to receive updated information through QR codes will enhance the effectiveness of technical services and security measures. Passengers

will be informed about the latest news regarding technical services and safety measures, which will help ensure the stable and safe operation of these services.

Technical Capabilities and Limitations

To implement the QR code system in the metro, technical aspects need to be considered. The data connected to each QR code must be stored in a central information database and updated regularly. Continuous technical support and monitoring of the technological infrastructure will be necessary. Each QR code requires a stable internet connection, and each station must ensure good signal coverage. The technical team will be responsible for maintaining the service and providing technological support.

Conclusion

The project of providing information about metro stations through QR codes creates significant convenience for passengers. The implementation of the project will improve the metro usage experience for passengers, save their time, and enhance metro services. Additionally, the project will help improve the quality of metro services and increase the level of metro usage by passengers.

Through this project, the improvement of services will increase the number of passengers, boost metro revenues, create new advertising and marketing opportunities, and open up new sources of income for the metro. As a result, it will contribute to the overall economic efficiency of the metro system.

References

1. **O‘zbekistonda QR kod texnologiyasining rivojlanishi va uning transport tizimida qo‘llanilishi** // Texnologiya va Innovatsiya jurnal, 2023.
2. **Nazarov, S., Karimov, J.** “O‘zbekistonda transport tizimida raqamlashtirishning dolzarb muammolari va ularning yechimi.” O‘zbekiston Texnika Universiteti Ilmiy Nashri, 2022.
3. **Denso Wave Incorporated.** “QR Code Essentials.” Denso Wave (1994). Available at: <https://www.denso-wave.com/qrcode/>
4. **Jones, R., and Smith, L.** “QR Codes in Public Transportation: A Case Study.” *Transportation Technology Journal*, vol. 15, no. 3, 2020, pp. 215-230.
5. **Evans, C.** "Digital Innovation in Public Transport: QR Codes and Beyond." *International Journal of Transport Innovation*, 2021, pp. 112-125.