

Advanced Biometrics Scanning: Preventing Unwanted Access in Public Transport

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Abstract:

In order to prevent unwanted access, this essay examines how advanced biometrics can be integrated into the ever-changing public transportation security landscape. The abstract establishes the scene by outlining the growing problems that public transportation networks are facing, such as ticket fraud and security lapses. It explores technology such as fingerprint scanning and facial recognition to present the idea of enhanced biometrics. The paper looks at implementation tactics and highlights the advantages, like increased security and increased productivity. Successful biometric installations are demonstrated through real-world case studies, and privacy concerns and new trends are covered. This investigation ends with predictions about the use of biometrics in public transportation, providing a thorough rundown of a revolutionary strategy for improving system security.

Keywords: Biometrics, Public transportation security, Fingerprint scanning, Facial recognition

1. Introduction:

Conventional security methods are facing increasing hurdles in the intricate environment of public transportation, where passenger safety and security are of utmost importance. This introduction emphasizes how crucial it is to assess and strengthen these defences in order to effectively combat changing threats.[1] Risks such as ticket fraud, illegal entry, and security breaches necessitate a careful and pre-emptive response.

Upon commencing this investigation, the incorporation of sophisticated biometrics appears to be a viable resolution. Advanced biometrics, in contrast to traditional techniques, make use of cutting-edge technologies like iris detection, fingerprint scanning, and facial recognition. These technologies offer a more seamless and effective way to manage access control in public transportation networks, in addition to improving the accuracy of identification verification.[2]

The article aims to explore the security picture of public transportation and provides insights into how enhanced biometrics can help mitigate current issues. In doing so, we explore methods of implementation, look at concrete advantages, analyse case studies from the actual world, and discuss the practical and ethical issues related to using biometric solutions in public areas. The ultimate goal of this investigation is to offer a thorough grasp of how cutting-edge biometrics can alter security paradigms in the context of public transportation.

2. Current Challenges in Public Transport Security:

Ensuring the safety and integrity of the service is of paramount importance in the changing environment that public transportation systems operate in. But this project has a lot of moving parts, therefore security needs to be handled carefully. A recurring problem, ticket fraud jeopardizes revenue sources and fare collecting

systems' effectiveness. Tailgating or evading authorities to gain unauthorized entry puts passengers' safety and system integrity at risk. Furthermore, precautionary and preventative procedures are necessary due to the possibility of security breaches, which can range from minor events to more serious threats.[3]

While somewhat successful, conventional security measures are unable to match the cunning and flexibility of contemporary threats. Upon closer examination of these issues, it is clear that a paradigm change is needed to strengthen public transportation security. A workable answer to these problems is advanced biometrics, which offers a more reliable, accurate, and flexible method of access management and identity verification. The next sections will explore how sophisticated biometrics might provide focused and revolutionary responses to the complexities of public transportation security issues.

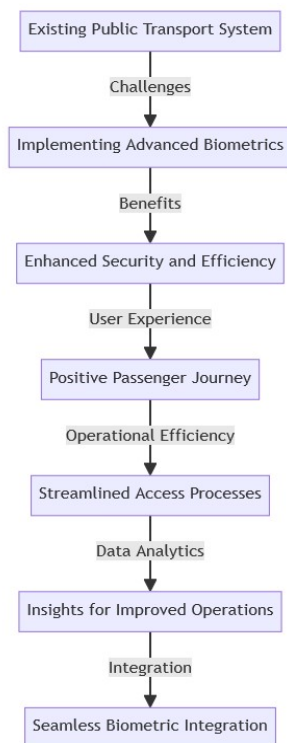


Figure 1: Integration of Biometrics in Public Transport System

3.The Role of Advanced Biometrics

By exploring the finer points of each biometric modality, we hope to demonstrate the adaptability and accuracy of these technologies in identifying between people. The possibility of multimodal biometrics, in which security is further improved by combining various biometric factors, is also discussed. The groundwork for comprehending why sophisticated biometrics is positioned as a transformational force in altering the management and security of access in public transportation systems is laid out.

4.Implementation Strategies:

Careful planning and execution are necessary when using advanced biometrics in the context of public transportation security. The several approaches to incorporating biometric technologies into current access control systems are examined in this section. It takes into account how biometrics may be seamlessly integrated into turnstiles, ticketing systems, and other access points found in transportation infrastructure.

The conversation also explores the issues of user acceptability, scalability, and interoperability. Analysing the various biometric implementation modalities—from centralized databases to mobile applications—offers insights into the viability and flexibility of these approaches. Comprehending the subtleties of implementation is essential to guarantee a seamless shift to sophisticated biometrics and optimize its influence on augmenting security in public transportation networks.

5.Benefits of Advanced Biometrics in Public Transport:

It describes the many advantages that come with implementing these cutting-edge technology when public transportation networks make the shift to sophisticated biometrics. At the forefront is enhanced security, where sophisticated biometrics provide a more dependable way to verify identity and lower the chances of ticket fraud and illegal access.

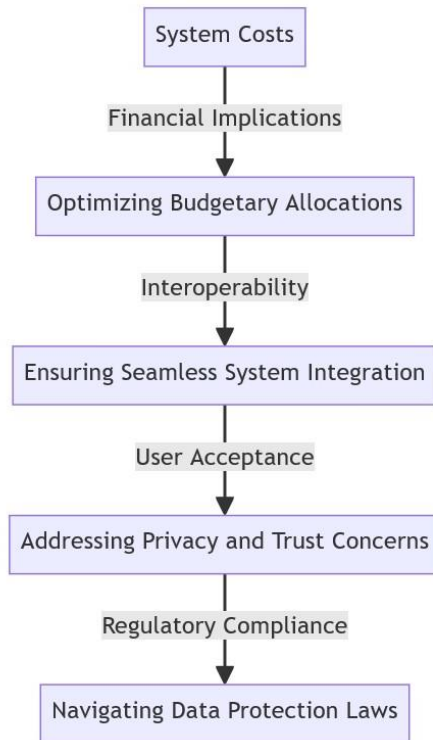


Figure 2: Biometric Implementation Challenges and Considerations

Efficiency gains also become apparent, as expedited access procedures result in quicker boarding and less traffic. Passengers may easily utilize the transportation system without the inconveniences of traditional ticketing methods, which improves the user experience.

The conversation also explores the ways in which biometrics improve overall operational effectiveness, providing information on data analytics for passenger flow, customized security warnings, and the possibility of integrating with smart city

projects. This section provides a thorough explanation of why enhanced biometrics is a driving force behind improvements in public transportation systems.

Case Studies and Success Stories:

This part takes the reader on a globe tour through engrossing case studies and success stories that highlight the revolutionary role that enhanced biometrics play in public transportation security.

City-wide Transit Systems: Examine how large cities have effectively incorporated cutting-edge biometrics into their whole public transportation systems. See how smoothly biometric-enabled access replaces traditional ticketing, improving operating efficiency, reducing fare evasion, and enhancing security.

Transportation Hubs: Examine case studies centered on significant transportation hubs where biometrics have proved crucial in bolstering security, such as airports and central train stations. Learn how access control has been transformed by facial recognition, fingerprint scanning, or iris detection technology, making travel safer and more effective.

Mobile-Based Biometric Solutions: Learn about successful biometric technology implementations through mobile applications. See how mobile-based solutions improve the accessibility and ease of public transportation while guaranteeing strong security measures, from biometric verification for mobile ticketing to facial recognition for boarding.

Challenges and Considerations:

Although the use of advanced biometrics in public transportation security has many advantages, this section honestly discusses the difficulties and factors that must be taken into account when putting them into practice.

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System Costs: Examine the financial effects of implementing sophisticated biometric systems, taking into account the total cost of ownership as well as setup and maintenance costs.[4] Evaluate the ROI and investigate methods for making the most use of your budgetary resources.

Interoperability: Consider the difficulties of incorporating biometric technology into the current infrastructure. Think about the necessity for defined protocols, compatibility with legacy systems, and any obstacles to smooth interoperability.

User Acceptance: Recognize how critical it is to win over the public to biometric technologies. Examine issues with data security, privacy, and the moral application of biometric data. Examine tactics for open dialogue and instruction to promote public confidence.

Regulatory Compliance: Handle the intricate web of privacy rules and data protection regulations.[5] Recognize the legal frameworks governing the use of biometric data in public areas and make that local, national, and international standards are being followed.

Conclusion:

Upon concluding our investigation into the use of sophisticated biometrics to public transportation security, it is clear that this technology ushers in a new era of effectiveness, security, and user-centeredness.

A thorough picture of the revolutionary potential of advanced biometrics is painted through the combination of case studies, success stories, and an open assessment of difficulties. The advantages are evident and promising, ranging from reducing ticket fraud to improving security and expediting passenger flow.

Advanced biometrics seems not only as a remedy but also as a strategic necessity as public transportation networks struggle with the ever-changing set of security issues. The favorable results seen in a number of international implementations highlight how flexible and efficient biometric technology are.

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