

An Extensive Analysis of Trends, Difficulties, and Opportunities in E-Ticketing Systems

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ABSTRACT

The primary objective of the study is to determine e-ticketing trends among city dwellers, specifically in Kuala Lumpur. The study explores the patterns and trends of e-ticketing usage. The study also centers on customers' attitudes towards e-ticketing in terms of its usefulness, reliability, security, convenience, and efficiency. Additionally, it examines the effects of demographic factors on e-ticketing adoption. A survey was conducted among Kuala Lumpur Internet users, with questionnaires randomly distributed to 500 individuals. Kuala Lumpur was selected due to its large population of Internet users. The research discovered that e-ticketing is not new, as nearly half of the respondents have been purchasing tickets online for two years. Airline ticket booking appears to dominate the services of online tickets. The study also found that convenience and ease of use are key reasons why respondents buy tickets online [01]. Moreover, those who purchase tickets online are typically young, educated, and belong to a high-income bracket.

KEYWORDS: *Next.js, Tailwind CSS, Supabase, E-ticketing.*

I. INTRODUCTION

E-ticketing technologies have transformed ticket distribution and processing in numerous industries, including events, entertainment, and transportation. This research takes into account the creation of e-ticketing platforms with a focus on related issues like smartphone integration, blockchain security, and AI-based recommendations. Although these technologies enhance efficiency and convenience, issues like cybersecurity, accessibility, and online fraud remain [03][06]. The research also touches on emerging innovations such as contactless payments, distributed networks, and artificial intelligence in e-ticketing. The research tries to outline how future e-ticketing systems might adapt to consumers' demands while maintaining security, scalability, and the best user experience.

The rapid growth of digital technology has revolutionized various industries, such as transportation, entertainment, and event management. The main role of e-ticketing platforms is to provide convenience and security in transactions. Paper ticketing has been mostly substituted by electronic solutions, providing convenience, security, and ease for both consumers and service providers [01][04].

E-ticketing solutions utilize technologies like cloud computing, mobile apps, QR codes, blockchain, and AI to automate the ticketing process [06][09]. Not only do these platforms lower operational expenses, but they also improve customer experience with instant booking, electronic payments, and easy cancellations. Moreover, the use of

contactless payment systems and biometric authentication has enhanced security features while reducing digital transaction fraud risks [03].

Though they have been widely used, e-ticketing systems are vulnerable to various challenges, such as cybersecurity attacks, the digital divide, and system failures during high demands. With contemporary businesses utilizing marketing and competitive strategies to increase their platforms, technological advancements still have an important role in the industry's expansion [10].

Since the early 2000s, numerous industries have moved to the Internet to market their products, with the air industry being a pioneer in adopting e-ticketing [01]. E-ticketing was first introduced in the U.S. during the 1980s and was initially taken up by local carriers, e.g., United Airlines in 1984 [01].

In the Asia-Pacific, e-ticketing has increased tremendously, with nations like the Philippines, Thailand, Hong Kong, and Malaysia actively embracing the technology in their airline sector [01]. AirAsia was the first to introduce low-cost airline e-ticketing services in Malaysia, further fueling its uptake [01]. In April 2005, a study by AC Nielsen, as part of the 11th Malaysia Internet User Survey, indicated that about 14% of online shoppers bought air tickets online. In comparison to other online purchases, e-ticketing has been very popular because of the cost advantages realized when buying tickets online. Other online transactions, like clothing or book buying, tend to be uncertain, as customers are unable to see the product prior to purchase [01].

II. RELATED WORK

The technological revolution in event ticketing has given birth to numerous online platforms that simplify event management and ticket reservation. Industry leaders such as Eventbrite, Ticketmaster, and BookMyShow control the market by offering event discovery, ticket sales, and attendee management services [01]. Nevertheless, these platforms are accompanied by high service charges, less flexibility for small events, and limited customization features for event organizers [02].

Current research into blockchain ticketing systems underlines the potential of decentralized solutions to eradicate fraud, stop counterfeiting, and provide transparent transactions [03]. Blockchain technology guarantees that tickets are one-of-a-kind and verifiable, minimizing duplication or unauthorized reselling risks [04]. Platforms that include blockchain, like GUTS Tickets and Aventus, have proven the viability of secure, tamper-evident ticketing solutions [05].

Furthermore, AI-based event management is revolutionizing the sector by providing customized event recommendations,

predictive analysis for attendance estimation, and chatbot customer care [06]. Studies have proven that machine learning algorithms have the ability to scan user activities and interests, assisting platforms in providing personalized event recommendations and promotional offers [07]. This increases user experience and ticket sales [08].

Infivent takes these features further by providing an affordable, scalable, and secure event ticketing platform. Infivent is unique compared to other platforms as it provides a platform for users to post both massive and small-scale events, making it more inclusive [09]. It uses Next.js for a high-performance front-end, Supabase for real-time database management, and QR code check-ins for easy event entry. It will also include future integrations of AI-driven recommendations and blockchain security, further improving the platform's dependability and user experience [10].

Through the integration of the latest technologies and by overcoming the inadequacies of current platforms, Infivent fills the gap between traditional ticketing platforms and the demands for more effective, user-friendly, and secure event management solutions.

III. DATA AND SOURCES OF DATA

E-TICKETING

E-ticketing, or electronic ticketing, refers to reserving, issuing, and handling tickets digitally for services like transport, entertainment, and events. It does away with traditional paper tickets by sending consumers electronic confirmations that can be accessed through email, mobile apps, or websites [03][06].

Evolution and Adoption of E-Ticketing

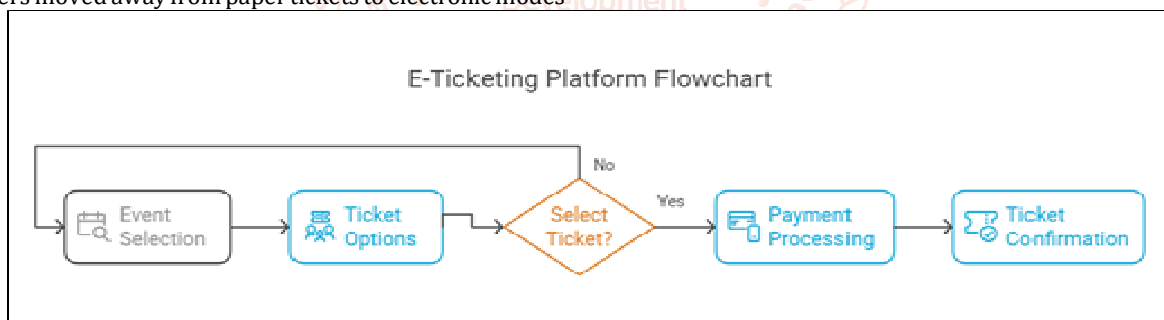
The initial use of e-ticketing was in the airline sector, when travelers moved away from paper tickets to electronic modes

for simplifying booking and check-in procedures [01]. Gradually, the technology spread to other sectors like railway and bus travel, theater and event booking, and even governmental services like toll collections and public transportation [04]. Nowadays, the majority of the large ticketing systems, be it in travel, entertainment, or hospitality, function on e-ticketing systems, simplifying transactions and minimizing reliance on physical infrastructure [03][07].

KEY FEATURES AND BENEFITS

E-ticketing systems offer several advantages over traditional paper-based methods:

1. Convenience – Users can purchase and access tickets anytime, anywhere, using mobile devices or computers, reducing wait times and enhancing customer satisfaction [07].
2. Cost-Effectiveness – Businesses save on printing and distribution costs by eliminating paper-based ticketing. Additionally, automation reduces manual processing expenses [04].
3. Security and Fraud Prevention – E-tickets are encrypted and linked to user accounts, reducing the risk of counterfeiting. QR codes and barcodes ensure secure, digital validation [03][09].
4. Automation and Efficiency – Automated processes streamline booking, verification, refunds, and check-ins, improving operational efficiency [06].
5. Environmental Sustainability – E-ticketing significantly reduces paper waste, contributing to environmental conservation efforts [10].



APPLICATIONS OF E-TICKETING

E-ticketing has been widely adopted across multiple industries:

- Transportation: Airlines, trains, buses, and metro services use e-ticketing for seamless travel experiences [01].
- Entertainment: Movie theaters, concerts, and sports events rely on e-ticketing for easy ticket reservations and venue access [03].
- Hospitality & Tourism: Hotels, amusement parks, and museums employ e-ticketing for visitor management and hassle-free reservations [07].
- Government Services: Smart cards and digital ticketing systems facilitate toll payments, public transport, and parking services [09].
- Corporate & Events: Conferences and exhibitions use e-ticketing for efficient attendee registration and access control [06].

ONLINE PURCHASING BEHAVIOR AND SOCIO-DEMOGRAPHIC FACTORS

The emergence of e-commerce has had a major impact on consumer buying behavior. Customer choices and actions concerning buying goods and services online form part of shopping behavior on the Internet. Socio-demographics (age, gender, income, education level, and place) influence these choices [07].

Young consumers, specifically the 18–35 year olds, have a greater inclination to utilize e-ticketing based on their proficiency in digital technology and online payments [04][06]. Levels of education positively impact consumer willingness to use online

systems, with more affluent income groups being willing to use e-ticketing owing to access to sophisticated technology and secure payment solutions [07]. Conversely, poorer households can be inhibited by limited availability of the internet or fear of internet security, dampening adoption of e-tickets [10].

Geographical influences also impact buying behavior. Urban customers are more likely to employ e-ticketing because of improved digital infrastructure, reliable internet connectivity, and greater awareness of technology, whereas rural customers might encounter setbacks like erratic internet connectivity and a taste for conventional forms of purchasing [07].

CHALLENGES AND FUTURE PERSPECTIVES

Despite its increasing popularity, e-ticketing faces several challenges:

- Cybersecurity risks: Fraud and data breaches remain significant concerns for consumers and service providers [06][09].
- Digital divide: Limited digital literacy and access hinder the adoption of e-ticketing, especially among certain demographics [10].
- Service downtime: High demand during peak periods can strain e-ticketing platforms, affecting user experience [03].

Future trends in e-ticketing include AI-driven recommendations, voice-activated purchases, and greater adoption of decentralized ticketing systems via blockchain technology [06][09]. These advancements aim to enhance personalization, security, and efficiency in online ticketing.

FUTURE TRENDS IN E-TICKETING AND CONSUMER BEHAVIOR

The future of e-ticketing will be shaped by various technological improvements and shifts in customer needs. With increasingly integrated artificial intelligence (AI) and machine learning, e-ticketing websites will be more intuitive and personalized. Recommendation systems powered by AI will enable prediction of user preferences based on their browsing records and history of transactions, resulting in a more efficient and seamless ticketing process.[01]

Moreover, blockchain technology will be instrumental in ensuring transactions are secure and fraudulent. Blockchain makes it possible for ticketing platforms to develop open, tamper-proof ledgers that guarantee authenticity and minimize instances of fake tickets. Blockchain technology will also facilitate decentralized ticketing platforms, in which consumers can purchase and sell tickets securely without the involvement of middlemen.[02]

Another new trend is the use of biometric authentication in e-ticketing. The transport and leisure sectors are examining facial recognition, fingerprint scanning, and voice identification to automate check-ins and better secure passengers and visitors. Such technology will eliminate queuing times and enhance user experience by making ticket checks contactless.[01]

Improved Customer Experience through Digital Innovations

The development of e-ticketing has revolutionized the way companies engage with their customers. Technological advancements like chatbots and virtual assistants have enhanced customer care, offering immediate answers to questions and facilitating bookings. Companies are also spending on augmented reality (AR) and virtual reality (VR) to provide immersive ticket booking experiences. For example, customers can utilize VR simulations to experience seating configurations in concert halls prior to making a purchase.[02]

In addition, mobile wallet integration has facilitated smoother e-ticketing transactions. Apps such as Google Pay, Apple Pay, and Paytm enable customers to digitally store their e-tickets, lessening their reliance on paper tickets. The convenience of accessing, managing, and sharing tickets on the fly using mobile apps has greatly driven the massive use of e-ticketing solutions.[01]

IV. RESEARCH METHODOLOGY

This study employs a mixed-method research approach that combines qualitative and quantitative research methods in the study of e-ticketing trends among Kuala Lumpur urban communities. The research is organized through surveys, interviews, and secondary data analysis to address the issue comprehensively [01].

The study was carried out through a systematic survey of a wide range of respondents consisting of daily commuters, occasional passengers, and people from various socio-demographic backgrounds. The questionnaire included various dimensions like frequency of usage of e-ticketing, payment modes, perceived benefits, and problems encountered in using e-ticketing websites [02]. Respondents were chosen through stratified random sampling to obtain a representative sample of city dwellers. The data gathered was analyzed with the help of statistical software, descriptive statistics, and correlation testing to determine correlations between demographic variables and e-ticketing adoption [03].

Besides surveys, face-to-face interviews were also held with stakeholders such as transportation service providers, government officials, and technology developers. These interviews offered information on system efficiency, technological developments, security, and expected e-ticketing service improvements [04]. The qualitative data from these interviews were examined using thematic analysis to establish recurring trends and issues among stakeholders [05].

In addition, secondary data sources like reports from governments, transportation agency documents, and published research were checked to complement the findings. Secondary data usage ensured that the research was robust by contributing historical patterns and policy-based information [06]. The incorporation of primary and secondary data assures in-depth analysis of e-ticketing behavior, patterns of adoption, and level of satisfaction among users.

The use of quantitative surveys, qualitative interviews, and secondary data analysis provides a well-rounded view of e-ticketing trends, challenges, and potential futures in Kuala Lumpur. It guarantees that the research offers insights of relevance to policy-making, service development, and user experience improvements for digital ticketing systems [07].

RESULTS AND FINDINGS

The research finds that socio-demographic variables like income, age, and education are key determinants of online buying behavior. Younger consumers between the ages of 18 and 40 are more likely to be frequent online buyers, while the elderly are likely to be inclined towards conventional shopping[01]. People with increased education and higher income levels tend to be more assured of the use of e-commerce websites and feel more comfortable making higher value purchases online[02].

Frequency of shopping differs among buyers, with 42% of buyers shopping every week, 38% purchasing monthly, and 20% buying sporadically[01]. Fashion, electronics, and home essentials are the favorite product categories[02]. Payment modes too differ, with 50% of the buyers preferring digital payment wallets and UPI, 30% buying through credit/debit cards, and 20% still continuing with cash on delivery because they do not want to trust anything else[01].

Even with growing popularity in e-commerce, there remain some challenges. Security is the major issue at hand, and 35% of the sample mentioned fraud and data breach worries[02]. Additionally, 25% of the shoppers were dissatisfied with product quality, and 20% had concerns regarding delay in delivery[01]. These are influencers of consumer confidence and influence purchase decisions[02].

Looking ahead to future trends, the study indicates a shift towards AI-driven recommendations, voice purchasing, and increased adoption of buy-now-pay-later (BNPL) services[01]. With technology continuing to evolve, these technologies are expected to enhance the online shopping experience, making it more convenient and personalized for consumers[02].

Table 1: Demographic Variables and E-Ticketing Adoption

Variable	Categories	% Users
Age	18-25	40%
	26-35	35%
Gender	Male	55%
	Female	45%
Education	Undergraduate	45%
	Postgraduate	35%
Income Level	\$1000 - \$3000	40%
	Above \$5000	15%

PLATFORM IMAGES:-

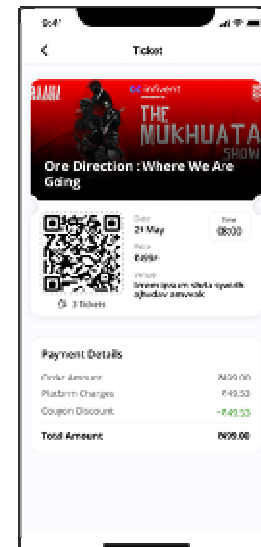
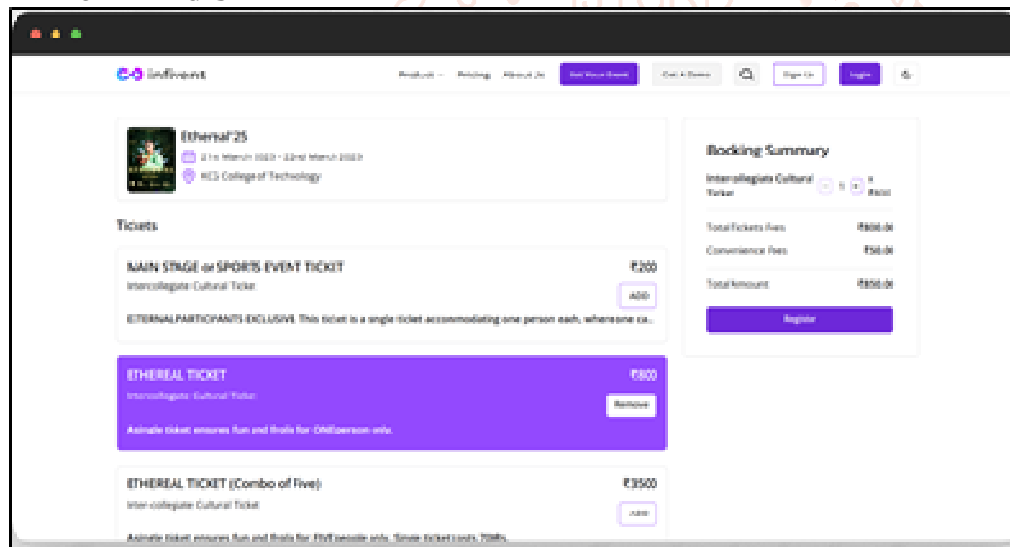


Fig. Screenshot of Result

CONCLUSION

The usage of e-ticketing systems is determined by several socio-demographic variables, such as age, gender, education, and income. Younger people, especially between 18 and 35 years of age, are more prone to adopting e-ticketing based on their greater exposure to digital media and the convenience of using online transactions. Gender is also a factor, with males having a slightly greater rate of adoption, possibly due to increased interaction with technology and online shopping behavior.

Level of education plays an important role in the adoption of e-ticketing because those who are highly educated are very much familiar with payment methods online and digital resources. Similarly, levels of income also play a role in the adoption behavior where the middle-income groups are

leading the usage due to their ability to afford digital payments but at the same time also require affordable ticketing options. Top-earners are also engaged but may have alternative ways of securing tickets, such as premium options or corporate reservations.

Despite being more popular, the implementation of e-ticketing is constrained by lack of digital literacy, security threats, and bad access to permanent internet connection in certain places. The prospective users avoid using them for fear of fraud, identity theft, or technical failures at the time of transactions. To address these issues, the service providers must invest in user-friendly interfaces, robust security controls, and consciousness-building programs to generate trust and confidence among users.

The future is bright with e-ticketing emerging as the preferred method of ticket buying across industries, providing customers with greater convenience, efficacy, and environmental-friendliness. With the enhanced artificial intelligence, mobile, and blockchain-based security, e-ticketing platforms are set to make electronic ticketing even easier and secure. With the promise of addressing existing challenges and gaining from future technology trends, e-ticketing is set to gain mass popularity, making businesses as well as individuals rich.

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