CHALLENGES AND STRATEGIES IN IMPLEMENTING A CENTRAL CLEARING HOUSE FOR UNIFIED TICKETING IN BANGKOK METROPOLITAN REGION'S PUBLIC TRANSPORT

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ABSTRACT

The study examines the challenges in implementing a Central Clearing House (CCH) for a unified ticketing system in Bangkok's public transport network in Thailand. The qualitative approach was conducted. In-depth interviews were used with eight key informants, employing purposive sampling. Content analysis was used to analyze the data. The findings illuminate the multifaceted challenges inherent in the implementation of a CCH in Thailand. The research underscores the necessity of meticulous planning, robust legislative frameworks, and collaborative synergy between governmental bodies and private sectors as fundamental strategies to navigate these complexities. The study further highlights that the endeavor to institute a CCH is not merely a response to logistical and operational challenges but also a strategic alignment with the global evolution of public transportation systems. This alignment is indicative of an acute awareness of and responsiveness to the dynamic needs and anticipations of contemporary commuters. The research posits that the realization of a more interconnected and efficient transit network is pivotal in meeting these evolving consumer demands and contributing to the broader discourse on urban mobility solutions.

Keywords: Central Clearing House (CCH), Public Transport, Ticketing System, Challenges, Bangkok Metropolitan Region

Introduction

Traffic congestion in Bangkok has long been a significant issue affecting the lives of residents in the metropolitan area and its surrounding vicinities. This problem has resulted in various economic impacts, such as altering commuting behaviors and travel methods of Bangkok residents, increasing domestic fuel consumption, and necessitating new public infrastructure investments to address traffic issues. Traffic congestion in Bangkok is a complex and long standing issue, with the city being ranked among the world's most congested cities by several international organizations (Bhu-Anantanondh et al., 2021; Marks, 2020; Vichiensan et al., 2021; Phiboonbanakit & Horanont, 2021; Prakayaphun et al., 2023). One of the primary causes of traffic congestion in Bangkok is the high number of vehicles on the roads and the inadequate public transport services to meet the population's needs. This results in a low proportion of public transport use compared to personal vehicle usage. In 2019, a survey found that the total travel volume in Bangkok and its surrounding areas was 11,124.3 million trips per year, with only 19.24% of these trips made using public transport systems. Notably, 80% of public transport users utilized regular buses. It is evident that the proportion of public transport users is still low compared to private vehicle users, partly due to various factors such as limited reach of mass transit systems, high ticket prices, unreliable transport schedules, and poor conditions of public transport vehicles. One factor contributing to the low usage of mass transit systems is the high cost of tickets, especially for electrified train services, which are the most expensive among public transport services. The average fare for an electrified train trip is around 28.30 baht, making it less accessible to a large portion of the population. When comparing the daily electrified train fare to the minimum daily income in Bangkok and its surrounding areas, passengers spend 26-28% of their income on daily electric train tickets (Kasikorn Research Center, 2016; Marks, 2019; Ayaragarnchanakul, & Creutzig, 2022). Addressing Bangkok's traffic congestion requires a multifaceted approach. Upgrading the public transport system, particularly in terms of mobility, comfort, convenience, and capacity, is essential. Railways have been identified as a crucial solution for future mass transit in the city. Plans are in place to construct additional train routes across Bangkok, with a focus on enhancing traffic efficiency and reducing operational costs. Increasing train routes is also environmentally beneficial, as most trains use electricity, whereas public buses are just starting to transition to clean energy. Innovations in the railway system are critical for the city's development, and expanding the mass rail network is expected to alleviate congestion, although additional measures will be necessary (Basu, 2017; Iamtrakul et al., 2017; Kii et al., 2021; The Nation 2023).

The Central Clearing House (CCH) is an integral component in electronic payment systems, serving as an intermediary platform that facilitates and categorizes transactions according to their respective service providers. This system plays a critical role in the operational framework

of electronic payments. The CCH is indispensable to contemporary business operations. Its significance lies not only in its convenience but also in its capacity to handle substantial financial transactions securely and reliably. The implementation of a CCH system enhances the efficiency of financial exchanges, ensuring both safety and dependability in electronic payment processing. This system's ability to manage large volumes of transactions effectively makes it a fundamental element in the financial infrastructure of digital commerce (Bangkok Payment Solutions Company Limited, n.d.; Office of Transport and Traffic Policy and Planning, 2015).

The traffic congestion problem in Bangkok is a result of outdated city planning, an increasing number of vehicles, inadequate public transportation, and economic growth. The high number of vehicles, combined with limited road space, leads to severe congestion, and the existing public transport system, especially buses, fails to meet the needs of many Bangkok residents. Addressing this issue requires improvements in public transport, particularly in expanding and integrating the mass transit network, and making it more accessible and affordable for the general population. Given their importance, the traffic congestion issues in Bangkok and the challenges in establishing a CCH in Thailand warrant thorough examination. Therefore, The study examines the challenges of establishing a CCH for a unified ticketing system in Bangkok's public transportation network. The establishment of a unified ticketing system through a CCH could have significant economic benefits, such as increased efficiency and cost savings in the long run. It could also have social impacts, like improved accessibility and convenience for the public, potentially leading to increased use of public transport and reduced traffic congestion.

Objective

The study examines the challenges of establishing a CCH to upgrade ticketing systems and integrate public transport in Bangkok and nearby areas.

Methodology

The research adopted a qualitative strategy as its core framework, emphasizing in-depth interviews—a cornerstone of qualitative studies. This method aims to unearth the underlying motives behind specific phenomena by examining the circumstances under which people or groups make choices and exhibit behaviors (Siripipatthanakul et al., 2022). In-depth interviews excel at providing granular insights on focused issues, thereby yielding data that align closely with the objectives of the research. These discussions offer an opportunity to thoroughly explore topics, achieving a level of understanding that quantitative approaches might miss (Brounéus, 2011; Khan & Razzaque, 2023). Furthermore, this study employed the documentary method as an auxiliary tool to bolster the gathering of primary data. This involved an in-depth analysis of

existing literature, which was instrumental in developing pertinent survey questions. The combination of firsthand insights from interviews and the analysis of secondary data through the documentary method laid a robust groundwork for the generation of comprehensive and precise findings. For participant selection, the research utilized purposive sampling, a technique prevalent in qualitative research for its targeted selection of individuals who possess significant insight into the study's focus, as judged by the researchers' expertise. This method seeks to deeply understand a specific phenomenon or group. The study's participants included eight distinguished professionals such as scholars, educators, and experts in the domains of shared ticketing systems and public transport networks, all above 18 years of age and residing in the Bangkok metropolitan region of Thailand.

Content analysis, employed as a qualitative technique, enables the systematic and objective identification and measurement of various phenomena. This approach allows for the extraction of valid insights from textual, visual, or auditory data sources (Asanprakit & Limna, 2023; Limna, 2023; Phuangsuwan et al., 2024). Within the scope of this research, content analysis served as the key instrument for examining the qualitative data collected through in-depth interviews. By applying this method, it was possible to interpret the subtle verbal feedback provided by participants, thereby facilitating a thorough comprehension of the study's topic.

Results

The challenges and obstacles in establishing a Central Clearing House (CCH) in Thailand primarily stem from organizational overlap and conflicting interests. Technical aspects are considered secondary. This issue arises from the overlapping responsibilities of several government and private entities invested in various electric train projects. Government agencies involved include the State Railway of Thailand, the Mass Rapid Transit Authority of Thailand (MRTA), and the Bangkok Metropolitan Administration. Major private investors include BTS Group Holdings and Bangkok Expressway and Metro, along with upcoming participant Eastern High-Speed Rail Linking Three Airports Co., Ltd., responsible for the Airport Rail Link and high-speed rail connecting three airports. A significant current barrier to establishing the CCH in Thailand is the absence of a specific Act to regulate, supervise, and manage the automated fare collection system in transportation. This leads to duplicated systems within both the public and private sectors and a lack of clear directives at both policy and operational levels for a unified plan for automated fare collection systems across all relevant agencies. Moreover, there is no existing agency that has the legal authority to act as a CCH, which requires legal backing to enforce data integration and fee determination among transport providers. For CCH operations to be viable, they must generate sufficient revenue to cover expenses. Therefore, in establishing a CCH, it is crucial to

assess potential revenues and expenses, considering the public transportation system has multiple concessionaires, each designing its fare collection system to maximize its initial investment return, unwilling to compromise this advantage. Regarding the management of Thailand's CCH, it is proposed that it should fall under a neutral, honest, and accountable government agency, such as the Office of Transport and Traffic Policy and Planning, Ministry of Transport. This would encompass fare systems for buses and boats as well. Alternatively, if bus and boat systems are not integrated, it could be managed by the Department of Rail Transport, with new concessionaires mandatorily participating in a unified ticketing system. The government might have to negotiate with or compensate existing concessionaires for integrating their fare collection systems to ensure data compatibility. A common ticketing system would increase passenger numbers depending on its clarity and convenience. If a central agency issues a card usable across all transport modes with some discounts, it will likely attract more users due to its ease and cost-effectiveness.

> *A CCH faces current challenges and obstacles due to the public transportation fare collection system involving multiple concessionaires. Each concessionaire has designed their own fare collection system to maximize their initial profits, reluctant to forfeit these benefits. The government lacks legislation that mandates these concessionaires to adopt a unified ticketing system or join the CCH* (Respondent 1).
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> *The CCH, ideally, should be managed by the Office of Transport and Traffic Policy and Planning to ensure comprehensive coverage, including bus and boat fare systems. The government needs to enact laws compelling future concessionaires to participate in a unified ticketing system* (Respondent 2).
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> *The primary challenges arise from organizational overlap and conflicting interests among government and private entities involved in electric train projects. These include the State Railway of Thailand, the Mass Rapid Transit Authority of Thailand, Bangkok Metropolitan Administration, and major private investors like BTS Group Holdings and Bangkok Expressway and Metro. The addition of Eastern High-Speed Rail Linking Three Airports Co., Ltd. further complicates the scenario* (Respondent 3).
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> *The technical aspects, while secondary, involve the need for a unified automated fare collection system. Currently, we have duplicated systems within both public and private sectors. This lack of a cohesive approach results in inefficiencies and conflicts at both*

policy and operational levels. Indeed, a significant barrier is the absence of a specific Act to regulate, supervise, and manage these systems. Without this, there's no clear directive for a unified plan. Also, no existing agency has the legal authority to act as a CCH, which is crucial for enforcing data integration and fee determination among transport providers (Respondent 4).

The financial aspect in establishing a CCH is crucial. For CCH operations to be viable, they must generate sufficient revenue to cover expenses. With multiple concessionaires involved, each aiming to maximize its return on investment, there's a reluctance to compromise on their fare collection systems (Respondent 5).

For management structure for Thailand's CCH, it's proposed that the CCH should fall under a neutral, honest, and accountable government agency, like the Office of Transport and Traffic Policy and Planning, Ministry of Transport. This would ideally encompass fare systems for buses and boats as well (Respondent 6).

If bus and boat systems aren't integrated, the Department of Rail Transport could manage it, mandating new concessionaires to participate in a unified ticketing system. However, this might require negotiations or compensation for existing concessionaires to ensure data compatibility (Respondent 7).

A common ticketing system, particularly one that is clear, convenient, and offers discounts, could significantly increase passenger numbers. A central agency issuing a card usable across all transport modes with some discounts would likely attract more users due to its ease and cost-effectiveness (Respondent 8).

Discussion

Successfully establishing a CCH in Thailand requires a holistic approach that includes organizational restructuring, legislative support, financial model building, client-centric service development, equity considerations and future-proofing strategies. These elements, if implemented synergistically, would not only address current challenges but also position Thailand's public transportation system for long-term sustainability and growth. The findings of the study are consistent with those of several other studies. According to Mahitthirook (2017), the lack of specific legislation to regulate, monitor and manage automated fare collection systems in transportation leads to duplicate systems in the public and private sectors. This also creates a

gap in providing clear guidance for a unified fare collection system. In addition, none of the current authorities have the legal authority to act as a CCH, which is critical to enforcing data integration and setting charges between transport providers. To be financially viable, a CCH must generate enough revenue to cover its expenses. However, the involvement of multiple concessionaires, each with its own fare collection system, creates resistance to standardization and compromises the financial viability of a unified approach. In addition, Bresson et al. (2003) analyzed the impact of changes in factors such as fares, service quality and revenue on the demand for public transportation. They concluded that demand for public transport is very sensitive to fare changes, suggesting that policy measures to reduce fares, possibly through subsidies, could significantly increase the use of public transport and reduce dependence on private vehicles. Satranarakun and Kraiwanit (2022) recommended that fares should be set lower than the cost of parking and vehicle maintenance to increase the use of public transport. They also emphasized the need to improve both the operation and equipment of buses to better meet the needs of passengers. Mahitthirook (2017) also suggested that the management of Thailand's CCH should be placed under a neutral, honest and accountable government agency, such as the Office of Transport and Traffic Policy and Planning within the Ministry of Transport. This arrangement should ideally include bus and boat fare systems to ensure a comprehensive and integrated approach to public transportation fare management. In addition, Satranarakun and Kraiwanit (2023) emphasized the need for a CCH to be managed by either a government agency or a neutral entity. Transport service providers were recommended to undertake promotional activities through digital networks targeting potential users who have the financial means but do not currently use these services. The study also suggested a collaboration between metro systems and community groups and stakeholders. The goal of this partnership is to develop initiatives and programs that address the specific needs of vulnerable populations while ensuring universal access to public transportation. The importance of subway accessibility laws, rules and regulations that focus on affordability and accessibility for the entire population was emphasized.

Conclusion

The successful establishment of a CCH in Thailand, though fraught with complexities, is attainable through a multi-faceted approach. Detailed planning, comprehensive legislative support, and synergistic collaborations between public and private entities are crucial for navigating the challenges. Such a development necessitates an understanding of the intricate dynamics of various stakeholders, including government agencies, private investors, and transit operators, and their alignment towards a common goal. The legislative aspect involves crafting and enacting specific regulations to govern automated fare collection and ensure the legal

empowerment of the CCH. This would provide a structured framework for data integration and fare standardization across different transport modes. Moreover, financial sustainability is a pivotal factor. The CCH must be designed to be economically viable, taking into consideration the revenue generation and cost implications of integrating disparate fare collection systems. This includes negotiating with multiple concessionaires to achieve a balance between individual profit motives and the overarching objective of a unified system. Additionally, the project aligns with the global evolution of public transport systems, which are increasingly moving towards integration and user-centricity. The focus on a more connected and efficient transport system not only responds to the global shift in public transport but also caters to the evolving needs and preferences of the consumer base. This includes ease of access, affordability, and reliability of public transportation, factors that are essential in enhancing public transit appeal and reducing reliance on private vehicles.

Practical and policy recommendations

To successfully establish a CCH in Thailand and address the complexities of integrating a common ticketing system for public transportation, the following policy and practical recommendations are proposed:

1. Establish a comprehensive legal framework specific to CCH operations. This framework should regulate fare collection systems, ensure data integration across various transportation modes, and define the roles and responsibilities of involved stakeholders.

2. Foster a collaborative environment among all stakeholders, including government bodies, private investors, and public transport operators. Encourage regular dialogues and workshops to align interests and objectives.

3. Develop a sustainable financial model for the CCH. This could involve exploring various funding options, including government subsidies, public-private partnerships, and fare restructuring to ensure the viability and sustainability of the CCH.

4. Invest in advanced technology to support an integrated ticketing and fare collection system. Ensure the technology adopted is scalable, secure, and user-friendly, facilitating seamless transitions between different transport modes.

5. Design the CCH with a strong focus on consumer convenience. This includes creating a simple, understandable fare structure, ensuring ease of ticket purchase and recharge, and providing real-time information to commuters.

6. Conduct extensive training programs for staff managing the CCH and related systems. This will ensure smooth operations and effective handling of the technological and operational aspects of the system.

7. Implement stringent data security measures to protect user information. Ensure compliance with privacy laws and build public trust in the system.

8. Launch public awareness campaigns to educate commuters about the benefits and usage of the new system. Engage with the public to gather feedback and make iterative improvements.

9. Establish a robust monitoring and evaluation mechanism to regularly assess the performance of the CCH. Use data-driven insights for continuous improvement and adaptation to changing needs.

Implementing these policies and practical recommendations will be crucial for the successful establishment and operation of a Central Clearing House in Thailand, leading to a more efficient, integrated, and user-friendly public transportation system.

Limitations and recommendations for future studies

The research on implementing a central clearing house (CCH) for Bangkok's public transport system acknowledges certain limitations. The primary concern stems from the reliance on in-depth interviews with just eight participants, selected through purposive sampling. This raises questions about the comprehensiveness and representativeness of the outcomes. Despite the richness of the qualitative data, the absence of quantitative insights limits the ability to generalize the findings across a broader context. Moreover, concentrating solely on Bangkok's transportation network might overlook the varied challenges encountered in different regions or situations. Future studies should aim to expand both the methodological approach and the diversity of the participant pool. Incorporating a wider array of stakeholders, such as commuters, government officials, and the private sector, could yield a more holistic view. Integrating quantitative research methods would enable a finer analysis of the CCH scheme's impact and efficacy. Comparative analysis with regions that have adopted similar systems could shed light on effective practices. Longitudinal research would offer insights into the long-term effects of CCH implementation. Furthermore, exploring the influence of technology, innovation, and differing policy environments would enhance understanding of the complexities involved in applying CCH within urban transport networks.

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