

**ASSESSING THE IMPACT OF AIRPORT COLLABORATIVE DECISION-MAKING
FRAMEWORK ON QUALITY SERVICE DELIVERY IN TANZANIA;
A CASE OF JULIUS NYERERE INTERNATIONAL AIRPORT****Rehema Mlanzi Kampala**

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ABSTRACT

This study aimed to assess the Impact of Airport Collaborative Decision-Making Framework on Quality Service Delivery in Tanzania; A Case of Julius Nyerere International Airport. The specific objectives included to examine the role of information sharing in collaborative decision making on service delivery; and to identify the challenges that hinder the implementation of the A-CDM framework at JNIA. The theoretical framework incorporated Systems theory by Bertalanffy (1968) and Stakeholder Theory by (Freeman, 1984). The research design employed descriptive correlational design, with both quantitative and qualitative methods to obtain data from Julius Nyere International Airport. A sample of 119 participants was selected for the study using both simple random sampling and purposive sampling techniques, including air traffic controllers, Airport staff, ground handlers, airlines and passengers. Data were collected through interview and questionnaire methods. Data were analyzed both quantitatively and qualitatively and kept under validity and reliability. Findings revealed moderate levels of stakeholder collaboration, with 82% of respondents confirmed that information sharing enhances operational coordination and 75% reported on improved passenger satisfaction. Poor communication (78%, mean = 4.30), resistance to change (75%, mean = 4.24), technological limitations (83%, mean = 4.25), and insufficient training (66%, mean = 4.12). The study concluded that implementation of Airport Collaborative Decision-Making at Julius Nyerere International Airport contributed to improved service quality delivery and operational efficiency, but still, it is not at the outmost level due to the challenges facing the Julius Nyerere International Airport which were revealed in the study, these include poor communication, resistance to change, technological limitations and insufficient training. It was recommended that the Airport operator should invest in integrated communication systems, upgrading technological infrastructure, staff training, and a culture of adaptability among stakeholders.

Keywords:Airport Collaborative Decision-Making Framework, joint planning, coordination, and training among stakeholders

1.0 INTRODUCTION

Airport Collaborative Decision Making (A-CDM) is a modern airport operations management concept that emerged in response to increasing air traffic congestion, inefficient resource utilization, and delays in airport operations. Airport Collaborative Decision Making (A-CDM) is a process that improves airport operations by having all key stakeholders including airport operators, airlines, ground handlers, and air traffic control by sharing real-time information. (A-CDM) The concept originated in the United States in January 1998 as Collaborative Decision Making under the leadership of the Federal Aviation Administration. It aims at addressing operational inefficiencies, particularly those caused by weather-related disruptions and limited Airport capacity. Early studies conducted in the United State during pilot phase demonstrated a 15% reduction in delays during Ground Delay Programs, validating the potential of collaborative decision-making processes to enhance overall airport performance (Corrigan et al., 2015)

By the year 2005, the Euro control in collaboration with International Civil Aviation Organization and International Air Transport Association emphasized on the implementation of Airport Collaborative Decision Making (A-CDM) framework to set the global standards for airport operations. Research by International Air Transport Association (IATA) (2020) found out that airports implementing of the Airport Collaborative Decision Making (A-CDM) identified a 30% reduction in delays and a 20% increase in passenger satisfaction due to smoother check-in, baggage handling, and security processing. Studies from European and Asian airports show that Airport Collaborative Decision Making (A-CDM) leads to reduced taxi-out times, enhanced on-time performance, and improved turnaround efficiency (Euro control, 2021).

In the United States of America, Hartsfield-Jackson Atlanta International Airport, one of the busiest airports in the world, integrates Terminal Flight Data Manager (TFDM) tools to enable real-time data sharing among key stakeholders, including air traffic control, airlines, and airport operators (Leidos, 2023; MIT Lincoln Laboratory, 2021). This collaboration enhances situational awareness, optimizes departure sequencing, and reduces taxi-out delays (MIT Lincoln Laboratory, 2021).

For the case of Asia, at Singapore Changi International Airport, Airport Collaborative Decision Making (A-CDM) is used as a key part of the airport's smart operations strategy by integrating flight information, resource allocation data, turnaround status, and weather updates into a common platform. This enables all parties to make coordinated decisions regarding departure sequencing, gate management, and runway usage (Changi Airport Group, 2023; Civil Aviation Authority of Singapore, 2024; Singapore Airlines, 2023).

In Nigeria, the adoption of Airport Collaborative Decision Making is still in its early stages but is gaining attention as part of broader aviation modernization efforts. At Murtala Muhammed International Airport (LOS) in Lagos, the country's busiest international gateway, the Federal Airports Authority of Nigeria (FAAN), in collaboration with the Nigerian Airspace Management Agency (NAMA) and airlines, has initiated foundational elements of Airport Collaborative Decision Making through improved stakeholder coordination and data sharing (FAAN, 2022; NAMA, 2023).

In Johannesburg, Airport Collaborative Decision Making is applied through a collaborative platform that allows real-time information sharing between airport operations, air traffic control, ground handlers, and airlines Airports Company South Africa, 2022; ICAO, 2021. The system focuses on optimizing the aircraft turnaround process, managing gate assignments, and sequencing departures more efficiently. The airport has developed an Airport Operations Centre (AOC) to coordinate decisions, respond to disruptions, and manage resource allocation collaboratively. These measures have led to better situational awareness, more reliable scheduling, reduced taxi-out times, and improved on-time performance at the airport (Airports Company South Africa, 2022; ICAO, 2021).

At Julius Nyerere International Airport in Tanzania, the implementation of Airport Collaborative Decision Making is at initial stage, though several modernization efforts are laying the groundwork. These include the commissioning of Terminal 3, which improved operational capacity and passenger handling, and upgraded digital systems worth \$20 million installed by Société Internationale de Telecommunications Aéronautiques (SITA), that introduced self-service kiosks, baggage tracking, and flight information systems (TAA, 2024).

In addition, Tanzania Civil Aviation Authority has made installation of voice and radar communication costed about \$14 million to strengthen Air traffic coordination. Julius Nyerere International Airport has been recognized by Airport Council International with safety award, signaling strong adherence to global aviation standards. These developments support future Airport Collaborative Decision-Making implementation by improving data sharing, stakeholder coordination, and operational efficiency (TCAA, 2023).

In light of the operational demands facing modern Airports, this study aims to assess the extent to which Airport Collaborative Decision Making has been implemented or not at Julius Nyerere International Airport. The study also aims to offer practical recommendations for enhancing Airport Collaborative Decision-Making service standards in the Tanzanian aviation context. The findings may contribute to addressing persistent challenges such as fragmented communication, uncoordinated workflows, and delayed flight operations, as observed in similar African Airport environments.

1.1 Statement of the Problem

Julius Nyerere International Airport, which is a large and growing hub in Tanzania and East Africa, faces significant challenges in maintaining operational efficiency and delivering quality passenger services amid increasing air traffic. The airport must contend with infrastructure constraints, fragmented communication among stakeholders, and evolving passenger expectations that strain existing systems (Tanzania Airports Authority, 2023; East African Civil Aviation Safety and Security Oversight Agency (EAC-CASSOA, 2022; ICAO, 2021). Inadequate implementation of Airport Collaborative Decision Making has resulted in frequent flight delays, long passenger queues, and baggage mishandling. Reports indicate that miscommunication and poor coordination among stakeholders, including ground handlers and air traffic controllers, accounted for 58% of domestic flight delays (TCAA, 2021). Additionally, 65% of passengers reported experiencing delayed baggage delivery, with waits exceeding 30 minutes during peak hours (TAA, 2020).

According to an internal report by Swissport Tanzania 43% of passengers surveyed expressed dissatisfaction with Julius Nyerere International Airport services, citing issues such as unclear signage, slow boarding procedures, and congested terminals report (SPT, 2023). These inefficiencies not only diminish customer satisfaction but also harm the airport's reputation and financial performance, potentially costing up to \$1.5 million daily during disruptions.

The absence of standardized communication and real-time information exchange exacerbates operational challenges, with studies linking weak Airport Collaborative Decision-Making frameworks to increased costs and safety concerns. As air traffic is projected to double by 2037 Julius Nyerere International Airport currently operates at approximately 70% capacity during peak times, underscoring the urgent need for proactive, technology-enabled collaboration tools (IATA, 2021).

This study aimed at assessing the extent to which the Airport Collaborative Decision-Making framework has been implemented or not in the provision of quality services at Julius Nyerere International Airport. It sought to identify challenges such as poor coordination and insufficient real-time data sharing that contribute to service delays and passenger dissatisfaction. By analyzing real cases and gathering stakeholder feedback, the study aimed to provide evidence-based recommendations to enhance Airport Collaborative Decision-Making practices, ensuring Julius Nyerere International Airport operational efficiency and its ability to meet future air traffic demands.

1.2 Specific Objectives

- i. To examine the roles of information sharing in collaborative decision making on service delivery at Julius Nyerere International airport.
- ii. To identify the challenges that hinder the implementation of airport collaborative decision-making framework at Julius Nyerere International Airport.

2.0 LITERATURE REVIEW

2.1 The roles of information sharing in collaborative decision making on Airport service delivery

Effective use of digital and automation technologies in Airport operations can significantly increase productivity, enhance customer satisfaction, and streamline workflows (Antwi, Ren, & Owusu-Ansah, 2021). Technologies such as self-service kiosks, biometric identity verification, baggage handling automation, and AI-powered analytics have transformed how passengers interact with airport services and how operational decisions are made. The incorporation of digital governance systems, including cloud-based platforms and Internet of Things (IoT) infrastructure, is becoming increasingly vital as the aviation sector advances into a more data-driven environment (Tan & Masood, 2021).

According to Ha, et al, (2020), the implementation of Enterprise Application Integration (EAI) systems at Incheon International Airport significantly improved operational efficiency and customer service. Their study applied advanced Metcalfe's Law to measure the network power of interconnected systems, revealing that increased

integration among Airport IT nodes led to better turnaround times and higher passenger satisfaction. Metcalfe's Law posits that the value of a network grows proportionally to the square of the number of its connected users or nodes, meaning that as more systems or stakeholders are connected, the overall utility and performance of the network increase significantly (Metcalfe, 2013; Schaar & Sherry, 2015). This underscored the importance of investing in robust IT infrastructure to facilitate seamless information sharing across departments and stakeholders.

A study done in France by Laplace et al. (2015) titled Resilience of Airports: Information Sharing and Decision Making explored the limitations of traditional Airport Collaborative Decision-Making platforms during crisis scenarios. The authors found out that while A-CDM systems are effective under normal operating conditions, they often lack the flexibility and coordination needed during disruptions such as severe weather or unexpected closures (Laplace et al. 2015). Their case studies at Paris Paris Charles de Gaulle Airport and Toulouse Blagnac Airports revealed that communication breakdowns among stakeholders, 'airlines, ground handlers, air traffic control, and Airport Authorities can lead to delayed responses and passenger dissatisfaction (Laplace et al. 2015).

Williams and Brown (2023) in England, conducted a study that evaluated the influence of communication and information delivery on passenger satisfaction at the Airports. Their findings highlighted that clear and appropriate communication regarding flight status, gate changes, and other pertinent information is essential for minimizing confusion and frustration among both passengers and staff (Williams and Brown, 2023). This underscored the importance of effective communication strategies in enhancing passenger experience. Building on this, effective Airport collaborative decision-making practices emphasize the necessity of clear communication channels among various stakeholders. The lack of structured communication has been identified as a significant barrier to implementing health regulations and responding to emergencies. By establishing a coordination mechanism, operational efficiency can be improved, ensuring that all parties are informed and can act swiftly during health crises (Williams and Brown, 2023).

The research by Gelžinis and Jarašūnienė (2024), which focused on the role of stakeholders and governance frameworks in Lithuanian airport development, continuously emphasized how governance and regulatory frameworks have a major influence on airport service delivery. The research found that while regulatory compliance is complex and poses ongoing challenges, effective governance significantly promotes operational efficiency and improves financial and customer satisfaction metrics. The research compiled and analyzed by Lohmann and Spasojevic (2025) in their global Research Handbook on Air Transport Leadership and Governance highlighted these themes further, emphasizing how governance structures shape airport performance worldwide.

2.2 The challenges that hinder the implementation of airport collaborative decision-making framework

Airport Collaborative Decision Making (A-CDM) strategies aimed at enhancing the quality of services at Julius Nyerere International Airport which face numerous challenges and underlying factors. These challenges are multifaceted, encompassing operational, regulatory, financial, and social dimensions. One of the key issues is inadequate infrastructure, which struggles to support the increasing demand from growing passenger traffic and cargo volumes (Mkoma & Msuya, 2021).

A study conducted in Brazil by Netto, et, al (2020) explored the implementation of Airport Collaborative Decision Making in the context of the International Civil Aviation Organization's Global Air Navigation Plan. Their study found out that institutional resistance, lack of training, and cultural differences among stakeholders were key inhibiting factors. The authors argued that while Airport Collaborative Decision-Making offers a structured framework for improving airport operations, its success depends on stakeholder buy-in and the ability to adapt global standards to local contexts. The research also highlighted the scarcity of academic engagement with Airport Collaborative Decision Making, suggesting a need for more empirical studies to guide implementation strategies (Netto, et, al (2020).

Modern technology, like the Airport Operations Database, is essential for streamlining airport operations, increasing productivity, and ensuring that passengers have a seamless journey (Nzulule, 2019). According to Nduhura et al. (2021), there are a number of challenges facing the implementation of Airport Operation Database in Tanzanian municipal Airports that need careful consideration. An all-inclusive system designed to compile and manage critical operational data in airports is the Airport Operations Database. Numerous data sources are incorporated into the system, including resource allocation, baggage management, passenger information, and flight scheduling (Nzulule, 2019). By offering real-time information, improving coordination, and eventually raising the general effectiveness of airport management, the use of Airport Operation Database is anticipated to drastically alter airport operations.

The Airport Collaborative Decision-Making Impact Assessment by EUROCONTROL (2017) highlighted operational complexity and data integration as significant barriers to Airport Collaborative Decision-Making implementation. The report, based on 17 European airports, found out that while Airport Collaborative Decision Making improves predictability and reduces delays, many airports struggle with integrating real-time data across diverse systems. These challenges are compounded by legacy infrastructure and inconsistent data standards among stakeholders. The study emphasized that without robust IT systems and harmonized data protocols, the full benefits of Airport Collaborative Decision Making cannot be realized (EUROCONTROL, 2017).

According to García-Herreros et al. (2022) explored the strategic and policy-level constraints affecting Airport Collaborative Decision-Making adoption in Latin American airports. Their research found out that while the benefits of Airport Collaborative Decision Making are well-documented, implementation is often hindered by misaligned national aviation policies, limited funding, and lack of institutional commitment. The study also noted that cultural differences in decision-making and communication styles among stakeholders can slow down collaborative efforts. They advocated for region-specific frameworks that accommodate local operational realities while aligning with global standards (García-Herreros et al, 2022).

According to Ntambi (2022) in Uganda, pointed out that the lack of adequate technology infrastructure at domestic airports could be a significant barrier to the seamless integration of Airport Operation Data Base systems. Also mentioned that a lack of funding could make it difficult to purchase and use Airport Operation Data Base technology, particularly for smaller local Airports. The successful implementation of Airport Operation Data Base necessitates a skilled workforce capable of operating and maintaining the system. (Ntambi, 2022). The presence of skill gaps among airport employees may hinder the successful deployment.

3.0 METHODOLOGY

The research methodology for the study assessing the impact of the Airport Collaborative Decision-Making framework on quality service delivery at Julius Nyerere International Airport is systematically structured to encompass a range of essential components, beginning with a descriptive correlational design that facilitates a comprehensive examination of stakeholder interactions without manipulating variables. The study utilized a mixed methods approach combining quantitative data collection through structured questionnaires and qualitative insights via interviews, targeting a sample of 119 participants drawn from various airport stakeholders, including air traffic controllers, ground handlers, and passengers. Data were analyzed using both descriptive and inferential statistical techniques, augmented by thematic analysis for qualitative responses, ensuring a robust understanding of the collaborative decision-making processes at the airport. The research emphasized the importance of ensuring validity and reliability, with pilot testing conducted to optimize the data collection instruments. Ethical considerations were strictly adhered to, guaranteeing participant confidentiality and voluntary participation throughout the study. This methodological framework not only provided a thorough analysis of operational efficiencies but also identified the challenges and opportunities inherent in the collaborative decision-making practices at the airport.

4. RESEARCH FINDINGS

4.1 Role of Information Sharing in collaborative decision making on service delivery

The study investigated how information sharing among stakeholders at Julius Nyerere International Airport (JNIA) significantly enhanced collaborative decision-making processes. The findings revealed that the availability of timely and accurate information played a crucial role in optimizing operational efficiency, enabling stakeholders to make informed and coordinated decisions. The study also examined whether compliance with governance policies positively affected the travel experience, revealing that respondents believed regulatory adherence contributed to smoother operations and reduced delays at Julius Nyerere International Airport.

Table 4.1: Responses to Statements on the Role of Information Sharing in collaborative decision making at JNIA from the questionnaire

S/N	Variables	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	SD
1	Information sharing among stakeholders at JNIA significantly enhances ACDM.	34	48	25	6	6	4.27	0.84
2	The availability of timely and accurate information is crucial.	40	47	16	8	8	4.32	0.79
3	Compliance with government policies positively affects travel expediciencies.	32	46	25	8	8	4.18	0.91
4	Information sharing positively impacts passenger satisfaction.	37	52	10	9	8	4.30	0.81

Source; Field Data (2025)

The findings indicated a strong belief among respondents on the importance of information sharing for enhancing ACDM at JNIA. Timely and accurate information is recognized as crucial for optimizing operations and improving passenger satisfaction, aligning with existing literature that underscores the role of effective information flow in collaborative decision-making.

The study on the (table 4.5) found that 82% of the respondents with 34% strongly agreed and 48% agreed that information sharing enhances the effectiveness of Airport Collaborative Decision Making (A-CDM), supported by a high mean score of 4.27. This strong positive response reflected a clear recognition among stakeholders at Julius Nyerere International Airport (JNIA) of the critical role that timely and transparent communication played in optimizing airport operations. Respondents emphasized that effective information exchange among airlines, ground handlers, air traffic controllers, and airport authorities is essential for synchronizing activities, anticipating disruptions, and making informed decisions. This aligned with the findings of Johnson et al. (2019), who argued that robust information sharing is the backbone of successful collaborative decision-making frameworks. Similarly, Goh et al. (2020) highlighted that improved information flow minimizes delays and enhances operational predictability. At JNIA, where diverse stakeholders must coordinate in real time, the integration of efficient communication systems and data-sharing protocols is vital for achieving the full benefits of A-CDM and delivering consistent, high-quality service to passengers.

In the (table 4.5) A significant 87% of respondents with 40% strongly agreed and 47% agreed which affirmed the importance of timely and accurate information in enhancing airport operations, reflected in a robust mean score of 4.32. This overwhelming consensus underscores the belief among stakeholders at Julius Nyerere International Airport (JNIA) that real-time data and precise communication are indispensable for streamlining workflows, reducing delays, and improving overall decision-making. In an environment like JNIA, where operational coordination among airlines, ground services, and air traffic control is complex and time-sensitive, access to accurate and up-to-date information enables proactive responses to dynamic situations such as weather changes, flight rescheduling, and resource allocation. This finding is consistent with the research of Wang and Zhang (2018) and Smith et al. (2020), who emphasize that timely and reliable information is a cornerstone of efficient airport management and collaborative decision-making. For JNIA, investing in advanced information systems and fostering a culture of transparency among stakeholders can significantly elevate operational performance and passenger satisfaction.

The study also in the (table 4.5) found out that 78% of the respondents with 32% strongly agreed and 46% agreed which approved that compliance with government policies significantly affects travel expediency, supported by a mean score of 4.18. This finding reflected a strong awareness among stakeholders at Julius Nyerere International Airport (JNIA) of the critical role that regulatory adherence plays in maintaining operational efficiency and ensuring smooth passenger flow. Respondents also acknowledged that aligning airport procedures with national aviation

regulations, customs protocols, and health and safety standards is essential for minimizing delays and avoiding administrative bottlenecks. This perspective is reinforced by Lee et al. (2019), who emphasize that policy compliance is not only vital for operational safety but also for sustaining efficiency across airport systems. At JNIA, where multiple agencies and service providers operate under a shared regulatory framework, consistent compliance ensures that collaborative decision-making processes remain legally sound and operationally effective, ultimately contributing to a more reliable and expedient travel experience for passengers.

The findings revealed (Table 4.5) that 89% of the respondents with 37% strongly agreed and 52% agreed which confirmed that information sharing positively impacted passenger satisfaction, reflected in a high mean score of 4.30. This underscores the belief that timely, accurate, and accessible information is a cornerstone of a positive travel experience. At Julius Nyerere International Airport (JNIA), where passenger volumes continue to grow, the importance of clear communication regarding flight schedules, gate changes, baggage handling, and security procedures cannot be overstated. Effective information dissemination through digital displays, mobile apps, public announcements, and staff interactions helps reduce passenger anxiety, enhances trust in airport services, and streamlines decision-making during travel. This aligned with the findings of Chen (2020) and Zhao et al. (2019), who emphasized that proactive information sharing not only improves satisfaction but also contributes to operational resilience by enabling passengers to adapt quickly to changes. For JNIA, investing in robust communication systems and staff training is essential to maintaining high levels of passenger satisfaction and competitive service standards. Effective information sharing plays a crucial role in enhancing passenger satisfaction by ensuring timely, accurate, and accessible communication throughout the travel experience. With an 89% positive response rate and a mean score of 4.30, respondents strongly believed that sharing relevant information such as flight updates, security procedures, and service changes reduces passenger anxiety and improves overall satisfaction. At Julius Nyerere International Airport (JNIA), this underscored the need for integrated communication systems and coordinated efforts among stakeholders to deliver seamless, responsive service. Literature by Chen (2020) and Zhao et al. (2019) supports this view, highlighting that timely information is one of the keys for improving passenger experiences and fostering trust in airport operations.

Below are the interview findings when respondents were asked about how does information sharing among stakeholders at JNIA enhance collaborative decision-making processes?

RP2 stated that;

Information sharing among stakeholders at JNIA is significant for enhancing collaborative decision-making processes because it helps in creating a common operational picture. When stakeholders such as airlines, air traffic control, ground handlers, and airport authorities have access to the same real-time data, they can make more informed and coordinated decisions (24, August 2025)

These finding proved that collaborative approach allows for consistent coordination of aircraft movements, gate assignments, and runway usage, leading to optimized ground handling processes and reduced taxiing times This finding aligned with the report by IATA (2020), which asserts that sharing information, values, and preferences enables stakeholders to learn from each other and build a common pool of knowledge, resulting in more valuable decisions and actions for the whole airport system.

When asked about how important is the availability of timely and accurate information for optimizing operational efficiency at JNIA,

RP3 responded that;

According to my understanding, availability of timely and accurate information is extremely important for optimizing operational efficiency at JNIA because real time data on passenger volume, security wait times, aircraft turnaround times, and baggage tracking empowers managers to anticipate and respond swiftly to changing conditions (24th August 2025)

The findings proved that proactive approach prevents cascading delays, improves resource allocation, and enhances the passenger experience. Access to immediate and accurate information enables better management of gates and timely provision of airport support services. This finding aligned with the study by the International Air Transport Association (2024), which reported that airports utilizing real-time analytics experienced a 22 percent reduction in average turnaround times for aircraft, leading to better on-time performance and increased airport capacity.

The overall findings from investigating on role of information sharing among stakeholders at Julius Nyerere International Airport (JNIA), showed how respondents expressed a strong belief that timely and accurate information is essential for optimizing airport operations and improving passenger satisfaction. Effective information exchange fosters coordination among airlines, ground handlers, air traffic controllers, and airport authorities, enabling them to anticipate disruptions and make informed decisions that streamline operations.

Moreover, stakeholders recognized that adherence to government policies is vital for maintaining operational efficiency and ensuring smooth passenger flow, emphasizing the importance of aligning airport procedures with regulatory standards. The study also underscored the positive impact of information sharing on passenger satisfaction, with respondents noting that clear communication regarding flight schedules, security procedures, and service changes significantly enhances the travel experience.

Interview responses reinforced these insights, with airport staff highlighting that shared real-time data creates a common operational picture that facilitates coordinated actions, while ground handlers emphasized the importance of timely information for effective resource management and improved service delivery. Overall, the findings indicated that investing in robust communication systems and fostering a culture of transparency among stakeholders is crucial for achieving operational excellence and enhancing passenger satisfaction at JNIA.

4.2 The challenges that hinder the implementation of airport collaborative decision-making framework at Julius Nyerere International Airport

The study also investigated on the challenges associated with implementing Airport Collaborative Decision Making (A-CDM) at Julius Nyerere International Airport (JNIA) and to identify strategies for enhancing airport services through collaborative practices. As the aviation industry increasingly emphasized efficiency and passenger satisfaction, understanding the barriers to effective ACDM implementation became critical. This study sought to explore various factors that influenced operational performance at JNIA, including communication breakdowns among stakeholders, resistance to change among staff, technological deficits, and inadequate training. By analysing these challenges, the research aimed to provide actionable insights that could inform airport management and policymakers in developing targeted interventions.

Table 4.2: Responses to Statements on Challenges affecting ACDM framework implementation from the questionnaire

S/N	Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Mean	SD
1	Poor communication among stakeholders negatively impacts service delivery here at JNIA.	42	36	20	10	11	4.30	0.83
2	Resistance to change among airport staff is a significant barrier.	40	35	25	10	9	4.24	0.80
4	Lack of technology and infrastructure affects service delivery at JNIA	38	45	20	10	6	4.25	0.82
5	Lack of training for staff on ACDM practices affects service quality at JNIA	35	31	25	14	14	4.12	0.88

Source: Field Data (2025)

The study in (Table 4.6) revealed that 78% of respondents with 42% strongly agreed and 36% agreed believing that poor communication negatively impacts airport service delivery specifically at JNIA as reflected in a high mean score of 4.30. This strong consensus highlighted the critical challenge of communication breakdowns among stakeholders involved in Airport Collaborative Decision Making (ACDM). At Julius Nyerere International Airport (JNIA), where coordination between airlines, ground handlers, air traffic control, and regulatory bodies is essential, ineffective communication can result in delays, misaligned operations, and passenger dissatisfaction. The lack of real-time data sharing and inconsistent updates can hinder proactive decision-making, especially during disruptions or peak traffic periods. This concern is echoed in the works of Ritchie and Brindley (2016) and Kaldasch (2018), who argued that communication failures are a major source of operational inefficiencies of complex airport environments as JNIA,

addressing these challenges through integrated communication platforms, stakeholder training, and standardized protocols is vital to unlocking the full potential of A-CDM and improving overall service delivery at JNIA.

The study in (Table 4.6) also showed that 75% of respondents where by 40% strongly agreed and 35% agreed that resistance to change is a significant barrier to implementing Airport Collaborative Decision Making (A-CDM) at JNIA supported by a mean score of 4.24. This reflects a widespread recognition that institutional inertia and reluctance to adopt new technologies or procedures can hinder progress in improving airport service delivery. At Julius Nyerere International Airport (JNIA), such resistance stem from entrenched operational habits, lack of awareness about ACDM benefits, or concerns over job roles and accountability. Transitioning to collaborative systems requires not only technological upgrades but also a cultural shift among stakeholders toward openness, adaptability, and shared responsibility. Kumar and Singh (2019) and Zhang et al. (2020) affirmed that resistance to change is a common challenge in aviation, often slowing innovation and integration efforts. For JNIA, implementing targeted change management strategies, including stakeholder engagement, training programs, and leadership support, is essential to overcoming resistance and fostering a collaborative environment conducive to ACDM success.

Furthermore, the study also (Table 4.6) 83% of respondents with 38% strongly agreed and 45% agreed believed that a lack of technology negatively affects airport service delivery, as reflected in a mean score of 4.25. This underscored a shared concern that technological deficits pose a serious obstacle to operational efficiency and the successful implementation of Airport Collaborative Decision Making (A-CDM). At Julius Nyerere International Airport (JNIA), outdated systems, limited automation, and insufficient integration between stakeholder platforms can lead to delays, data silos, and poor coordination. For example, the absence of real-time data sharing tools and predictive analytics hampers proactive decision-making and resource optimization. Goh et al. (2020) and Verhoeff et al. (2019) proved that inadequate technological infrastructure directly undermines service efficiency, especially in complex airport environments. To address this, JNIA must prioritize investments in modern ICT systems, interoperable platforms, and digital training for staff to enhance responsiveness, streamline operations, and fully realize the benefits of A-CDM.

The findings in (Table 4.6) reveal that 66% of respondents with 35% strongly agreed and 31% agreed which proved that lack of training negatively impacts service quality, supported by a mean score of 4.12. This highlighted a clear recognition that workforce development is essential for the successful implementation of Airport Collaborative Decision Making (ACDM). At Julius Nyerere International Airport (JNIA), the absence of structured and continuous training programs for airport personnel including ground handlers, airline staff, and regulatory agent scan lead to inconsistent service delivery, miscommunication, and underutilization of available systems. Many staff members may not be fully aware of ACDM principles or how to apply collaborative tools effectively, resulting in fragmented operations and reduced efficiency. Lee et al. (2019) and Johnson et al. (2020) stressed that ongoing training is vital for equipping employees with the skills and mindset needed to embrace new technologies and collaborative practices. For JNIA, investing in tailored training modules, simulation exercises, and cross-agency workshops can build a competent, agile workforce capable of driving A-CDM success and elevating overall service standards.

Interview findings on the challenges affecting the implementation of ACDM Framework

Under this section interviewee were asked on their view on challenges affection ACDM framework implementation and bellow are their responses

RP5 stated that,

Some departments are reluctant to change their traditional ways of working, which slows down the adoption of collaborative systems despite the push for Airport Collaborative Decision Making (A-CDM) framework and some legacy departments like customs and cargo handling still rely on manual logs and paper-based communication, making it difficult to integrate with digital systems used by airlines. (24, August 2025)

The statement underscores a critical challenge in implementing the Airport Collaborative Decision Making (A-CDM) framework: the reluctance of legacy departments, such as customs and cargo handling, to abandon traditional, manual processes. This resistance hinders the integration of digital systems, which is essential for improved collaboration and efficiency in airport operations. The finding concurs with that of Netto, et al, (2020) discuss the complexities involved in ACDM implementation, emphasizing that successful adoption requires not only technological upgrades but also a cultural shift within organizations. Their research highlights that departments must embrace collaborative decision-making practices to fully realize the benefits of ACDM. The reluctance of customs and cargo handling departments

to transition from paper-based systems to digital solutions exemplifies the barriers identified by the authors. They note that without addressing these institutional and cultural challenges, the potential of ACDM to enhance operational efficiency and coordination will remain unfulfilled.

RP8, stated that.

Certain departments continue to cling to traditional methods of operation, which hinders the adoption of collaborative systems, despite efforts to implement the Airport Collaborative Decision Making (A-CDM) framework. Legacy units such as customs and cargo handling still depend on manual records and paper-based communication, creating challenges in integrating with the digital platforms already utilized by airline operators. (24 August 2025)

The persistence of traditional work methods among certain airport departments such as customs and cargo handling presents a significant barrier to the effective implementation of Airport Collaborative Decision Making (A-CDM) frameworks. These departments' reliance on manual records and paper-based communication limits real-time data sharing and reduces operational transparency, thus impeding seamless coordination among stakeholders.

This finding aligns with Netto et al. (2020), who argue that one of the main challenges in adopting A-CDM lies in institutional inertia, where departments are slow to shift from legacy systems to integrated digital solutions. According to their study, the lack of technological readiness and a resistance to abandon familiar workflows creates fragmentation in operational processes, particularly in environments requiring synchronized decisions.

Zhang et al. (2021) similarly observed that traditional practices in key airport functions—such as cargo operations and immigration clearance often lag behind in digital transformation, undermining the overall efficiency gains expected from collaborative frameworks. Their research highlighted that without standardized digital communication across all units, the benefits of A-CDM, such as reduced delays and improved resource allocation, cannot be fully realized.

Moreover, IATA (2020) emphasizes that for A-CDM to succeed, all participating units must be equally integrated into the data-sharing ecosystem. Departments that remain outside digital systems become weak links, causing delays and misalignment, especially during critical situations like flight diversions, security alerts, or peak travel hours.

Therefore, the statement illustrates a critical operational gap that is not unique to JNIA but is echoed across many international airports undergoing A-CDM transitions. Addressing these issues requires targeted change management strategies, including stakeholder engagement, cross-departmental training, and investment in interoperable systems, as recommended by Kumar and Singh (2019).

RP9 stated that,

We lack the technological infrastructure to support real-time collaboration, which limits our ability to implement A-CDM effectively for example the absence of a unified digital platform means that flight status updates are often communicated via phone calls or emails, leading to delays in decision making especially when coordinating emergency landings or rerouting aircraft" (25 August, 2025)

The statement highlights that a lack of adequate technological infrastructure impedes the effective implementation of A-CDM, resulting in operational inefficiencies; for instance, the absence of a unified digital platform forces reliance on outdated communication methods like phone calls and emails for flight status updates, causing delays in critical decision-making during emergency situations such as coordinating emergency landings or rerouting aircraft. This deficiency is further compounded by the absence of real-time data sharing and collaborative tools, hindering stakeholders' ability to respond promptly and effectively to unforeseen events. These findings aligned with findings by Netto, et al (2020), who emphasized that ACDM implementation requires a collaborative decision-making process supported by robust technological infrastructure to ensure seamless information exchange and coordinated responses among all stakeholders without such infrastructure, airports cannot fully realize the benefits of ACDM in enhancing operational efficiency and safety.

RP7 stated that;

The airport has few E-gates for immigration clearance and the only two E-gates available are only at the arrival of terminal three and only used by Tanzanians and foreign passenger use manual clearance system, also we do have few boarding bridges and sometimes make passengers make long queues in open space while departing. (25 August 2025)

The statement pointed out two key infrastructure limitations at the airport: a scarcity of e-gates for immigration and a limited number of boarding bridges. The few e-gates available are restricted in their use location and user eligibility, forcing most foreign passengers to use manual immigration clearance, which is typically slower. The insufficient number of boarding bridges results in passengers having to queue outdoors, exposed to elements like the sun, winds and sometimes rains during departure. These limitations negatively impact passenger experience, increase processing times, and can lead to discomfort and potential safety concerns to passengers.

The findings finally revealed several critical challenges affecting service delivery at Julius Nyerere International Airport (JNIA) related to communication, resistance to change, technology, and training. A significant majority of respondents believed that poor communication negatively impacted airport service delivery, highlighting the importance of effective communication among stakeholders involved in Airport Collaborative Decision Making (ACDM). Ineffective communication was linked to delays, misaligned operations, and passenger dissatisfaction, particularly due to a lack of real-time data sharing. Additionally, resistance to change emerged as a notable barrier to implementing ACDM, with respondents recognizing that institutional inertia and reluctance to adopt new technologies hindered progress, stemming from entrenched operational habits and concerns about job roles.

Furthermore, respondents expressed concerns about technological deficits as a serious obstacle to operational efficiency, citing outdated systems and insufficient integration among stakeholder platforms, which contributed to delays and poor coordination. The lack of training was also identified as negatively impacting service quality, with the absence of structured, continuous training programs for personnel leading to inconsistent service delivery and underutilization of available systems. Overall, the findings underscored the necessity for JNIA to invest in integrated communication platforms, targeted change management strategies, modern technological infrastructure, and tailored training programs to enhance collaboration and improve overall service delivery in alignment with ACDM principles. RP10 Stated that.

There are limited E-gates available for immigration processing at the airport, with only two located at Terminal Three and currently reserved for Tanzanian nationals. Foreign travelers are required to undergo manual clearance procedures. Additionally, the airport has an insufficient number of boarding bridges, which often results in passengers queuing in open areas during departure, especially during peak hours. (26 August, 2025)

The limited availability of E-gates at Julius Nyerere International Airport (JNIA), restricted to Terminal Three and exclusively for Tanzanian nationals, highlights a significant infrastructural challenge impacting passenger processing efficiency. The reliance on manual immigration clearance for foreign travelers not only slows down the flow of passengers but also increases congestion and waiting times, particularly during peak periods. This situation is exacerbated by the insufficient number of boarding bridges, which forces passengers to queue outdoors, exposing them to environmental discomfort and potential safety risks.

Similar infrastructural limitations have been noted in other studies. For instance, Adeyemi and Obafemi (2018) found that inadequate automation in immigration processes contributes to increased passenger delays and dissatisfaction at airports in developing regions. The lack of sufficient boarding bridges has also been linked to operational inefficiencies and diminished passenger experience, as noted by Smith and Chen (2019), who emphasized that proper boarding infrastructure is crucial for maintaining smooth passenger flow and minimizing exposure to weather elements.

Furthermore, IATA (2020) recommends the expansion and modernization of airport facilities, including the installation of more E-gates and boarding bridges, to enhance operational efficiency and passenger comfort. Their guidelines suggest that integrating automated immigration systems for all passengers, regardless of nationality, can significantly reduce processing times and improve overall airport throughput.

Therefore, RP10's observation underscores the urgent need for infrastructural investments at JNIA to support the goals of Airport Collaborative Decision Making (A-CDM) and improve service delivery standards, consistent with global best practices in airport management.

5.0 SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary

The study also underscored the vital role of information sharing in enhancing Airport Collaborative Decision Making (ACDM) and improving passenger satisfaction, with 82% of respondents believed it enhances A-CDM effectiveness (mean score of 4.27). Timely and accurate communication among stakeholders, including airlines and air traffic

controllers, is crucial for optimizing operations, as evidenced by 87% affirming its importance for airport efficiency (mean score of 4.32). Additionally, 78% recognize that compliance with government policies significantly impacts travel expediency (mean score of 4.18), highlighting the necessity of regulatory adherence for smooth passenger flow. Notably, 89% of respondents assert that information sharing positively affects passenger satisfaction (mean score of 4.30), as effective communication reduces anxiety and fosters trust in airport services. These findings emphasized the need for JNIA to invest in advanced information systems and cultivate a culture of transparency among stakeholders to enhance operational performance and passenger experiences.

Furthermore, the study at Julius Nyerere International Airport (JNIA) highlighted significant challenges affecting the implementation of Airport Collaborative Decision Making (ACDM), with 78% of respondents indicating that poor communication negatively impacts service delivery, reflected in a mean score of 4.30. Ineffective communication among stakeholders leads to delays and passenger dissatisfaction, particularly during disruptions, underscoring the need for integrated communication platforms and standardized protocols. Additionally, 75% of respondents viewed resistance to change as a critical barrier, with a mean score of 4.24, stemming from entrenched habits and concerns over new technologies. The lack of technology is also a concern for 83% of respondents, with a mean score of 4.25, as outdated systems hinder operational efficiency and integration. Furthermore, 66% believed that insufficient training negatively impacts service quality, supported by a mean score of 4.12, indicating the necessity for continuous workforce development. Collectively, these study findings emphasized the importance of overcoming communication breakdowns, fostering a culture of adaptability, investing in modern technology, and prioritizing training initiatives to enhance service delivery and operational efficiency at JNIA.

5.2 Conclusion

The study concluded that the implementation of the Airport Collaborative Decision-Making (A-CDM) framework at Julius Nyerere International Airport (JNIA) positively influences the quality-of-service delivery through enhanced stakeholder collaboration and effective information sharing. While a strong consensus among stakeholders highlighted the benefits of real-time data and compliance with government policies, significant challenges such as poor communication, inefficient boarding bridges, resistance to change, outdated technology, and insufficient training remain prevalent. Addressing these challenges through the implementation of integrated communication systems, fostering a culture of adaptability, and investing in staff development is essential for optimizing operations and improving passenger satisfaction. By overcoming these barriers, Julius Nyerere International Airport can elevate its service delivery standards and fully realize the potential of Airport Collaborative Decision-Making, ultimately enhancing the travel experience for all passengers.

5.3 Recommendations

To address the identified challenges and enhance operational efficiency at Julius Nyerere International Airport (JNIA), several recommendations are proposed;

Implement Integrated Communication Systems: Invest in advanced communication platforms tailored for Julius Nyerere International Airport (JNIA) that facilitate real-time data sharing among airlines, ground handlers, air traffic controllers, and airport authorities. For example, implementing a centralized digital dashboard that displays live flight updates and operational changes can help all stakeholders coordinate more effectively, similar to systems used at major international airports like Singapore Changi Airport.

Julius Nyerere International Airport management should foster a Culture of Adaptability which encourages stakeholders at the Airport to embrace change by promoting a collaborative environment that values openness and flexibility. For instance, implementing a recognition program, similar to the one at Amsterdam Schiphol Airport, where teams that successfully adapt to new technologies are rewarded, can cultivate a positive attitude toward innovation and ultimately deliver quality service at Julius Nyerere International Airport.

Upgrade Technological Infrastructure, by Prioritizing investments in modern ICT systems and interoperable platforms, construction E-gates, more boarding bridges, ensuring that outdated systems are replaced. For example, adopting cloud-based solutions for data sharing, similar to those used at Dubai International Airport, can support real-time data exchange and predictive analytics, enhancing operational efficiency and passenger experience hence making Julius Nyerere International Airport a real mother Airport in Tanzania by providing quality services to both local and international travellers.

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Strengthening compliance mechanisms at Julius Nyerere International Airport (JNIA) is essential for ensuring adherence to government policies and regulations like Civil Aviation facilitation of air transport regulations. Establishing clear guidelines and comprehensive training for all stakeholders is crucial to create a culture of compliance. Regular workshops should be continuously given to airport employee, ground handlers, and air traffic controls and should also receive periodic updates on compliance standards and operational protocols to ensure alignment with national aviation regulations. These training sessions will not only enhance understanding of legal requirements but also address specific challenges faced by airport staff, such as risk management and emergency response procedures. By incorporating interactive elements, such as simulations and scenario-based training, Julius Nyerere International Airport can foster a proactive approach to compliance, enabling employees to better navigate complex regulatory landscapes. Additionally, establishing a feedback loop with employees can help identify gaps in training and compliance practices, ultimately leading to continuous improvement and a more resilient operational framework.

Promoting passenger communication initiatives at Julius Nyerere International Airport (JNIA) would be very important for enhancing the travel experience and ensuring passenger satisfaction. Developing targeted communication strategies aimed at informing passengers about flight statuses, security procedures, and operational changes will create a more informed traveler base. Utilizing digital displays and mobile apps, similar to the approach used by Hong Kong International Airport, can enhance transparency and reduce anxiety among travelers. These platforms can provide real-time updates on delays, gate changes, and security wait times, ensuring passengers are well-informed and can plan accordingly. Additionally, incorporating multilingual support in these communication tools can cater to the diverse passenger demographic, further improving accessibility.

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