

STRUCTURAL MODELING OF FACTORS INFLUENCING EMPLOYEE READINESS FOR ORGANIZATIONAL CHANGE IN AVIATION GROUND OPERATIONS*

HAVACILIK YER HİZMETLERİNDE ÇALIŞANLARIN ÖRGÜTSEL DEĞİŞİME
HAZIRLIK DÜZEYİNİ ETKİLEYEN FAKTÖRLERİN YAPISAL OLARAK
MODELLENMESİ

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Abstract

This study explores the critical factors influencing employee readiness for organizational change within the context of aviation ground operations—a sector undergoing rapid transformation due to the integration of digital technologies such as predictive maintenance and AI-driven systems. While change management has been widely studied in administrative and corporate settings, limited attention has been given to the frontline operational workforce in high-reliability industries like aviation. Using a quantitative, cross-sectional design, data were collected from 344 ground operations personnel through a structured survey instrument incorporating validated scales. Structural Equation Modeling (SEM) was employed to examine the effects of transformational leadership, internal communication satisfaction, training effectiveness, and technology readiness on employee readiness for change. The findings not only confirm the significance of these constructs but also reveal a moderation effect of technology readiness and a mediation effect of communication, highlighting the complexity of change dynamics in operational environments. The study contributes a novel perspective by extending established change management theories to a safety-critical, labor-intensive context and provides practical insights for HR professionals and change leaders in the aviation industry.

Keywords: Organizational change, Employee readiness, Aviation management, Ground operations, Digital transformation, Structural equation modeling (SEM)

JEL Classification Codes: M12, L93 O33, M53, D23

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Öz

Bu çalışma, dijital teknolojilerin—özellikle kestirimci bakım ve yapay zekâ destekli sistemlerin—entegrasyonu ile hızla dönüşen bir sektör olan havacılık yer hizmetleri bağlamında, çalışanların örgütsel değişime hazır olma düzeyini etkileyen temel faktörleri incelemektedir. Değişim yönetimi literatürde genellikle idari ve kurumsal bağlamlarda ele alınmış olsa da, havacılık gibi yüksek güvenilirlik gerektiren sektörlerde ön saflarda görev yapan operasyonel iş gücüne yönelik araştırmalar sınırlı kalmıştır. Bu çalışma, nicel ve kesitsel bir araştırma tasarımı kullanarak, doğrulanmış ölçeklerin yer aldığı yapılandırılmış bir anket aracılığıyla 344 yer hizmetleri personelinden veri toplamıştır. Yapısal Eşitlik Modellemesi (SEM) kullanılarak, dönüşümcü liderlik, iç iletişim memnuniyeti, eğitim etkinliği ve teknolojiye hazır olmanın değişime hazır olma üzerindeki etkileri analiz edilmiştir. Bulgular, bu değişkenlerin önemini doğrulamakla kalmamış, aynı zamanda teknolojiye hazır olmanın bir düzenleyici (moderasyon) etkisi ve iletişimin aracı (mediasyon) etkisi olduğunu da ortaya koyarak operasyonel ortamlarda değişim dinamiklerinin karmaşıklığını vurgulamıştır. Çalışma, mevcut değişim yönetimi kuramlarını güvenlik kritik ve emek yoğun bir bağlama taşıyarak alana yenilikçi bir bakış açısı kazandırmakta ve havacılık sektöründeki insan kaynakları profesyonelleri ile değişim liderleri için uygulanabilir öneriler sunmaktadır.

Anahtar Kelimeler: Örgütsel değişim, Çalışanların hazır oluşluğu, Havacılık yönetimi, Yer hizmetleri, Dijital dönüşüm, Yapısal eşitlik modellemesi (SEM)

JEL Sınıflandırma Kodları: M12, L93, O33, M53, D23

1. Introduction

The aviation industry is undergoing unprecedented digital transformation, characterized by the integration of predictive maintenance systems, enterprise asset management (EAM) platforms, AI-driven decision-making tools, and real-time operational planning systems. These technological advancements are reshaping not only air traffic and flight operations but also the core processes and responsibilities of ground operations personnel. Employees in roles such as ramp agents, maintenance technicians, and operations supervisors are now required to interact with advanced technologies and adapt to digitized workflows at a rapid pace (Cui et al., 2022; Borges et al., 2022). This evolving operational landscape demands not only technological investment but also a human-centered understanding of how employees respond to change, adapt their routines, and sustain new practices under pressure.

However, despite the critical role that ground personnel play in ensuring safety, timeliness, and operational continuity, there is a notable lack of research focusing on their readiness for organizational change. Much of the existing literature on change management in aviation emphasizes pilots, regulatory bodies, or managerial staff (Xue & Fu, 2018; Herrera et al., 2009), often neglecting the perspectives and needs of ground teams who are responsible for executing the operational core of aviation systems. These employees are frequently at the receiving end of top-down change initiatives—such as the introduction of digital inspection platforms or AI-based diagnostic systems—yet are seldom involved in the design or communication of these changes. The result is often confusion,

resistance, or disengagement, which can compromise safety, increase errors, and erode trust (Van Praet & Van Leuven, 2022).

This gap in attention becomes even more problematic given the increasing pace of technological implementation and the high reliability expected in aviation environments. As shown by Engida et al. (2022) and Latif et al. (2024), employee readiness for change (ERC) is influenced by several interrelated factors, including leadership behavior, training effectiveness, organizational communication, and employee attitudes toward technology. Without addressing these factors, digital transformation efforts may stall, be only partially adopted, or result in hidden inefficiencies. Moreover, ground operations are typically more hierarchical, time-sensitive, and exposed to physical risk, further magnifying the consequences of failed or poorly managed change.

The present study is motivated by the urgent need to understand what enables or impedes readiness for change among aviation ground operations personnel. Resistance in this context often stems from inadequate training, lack of clear communication, and insufficient leadership support (Indriastuti & Fachrunnisa, 2021; Rahi et al., 2022). This study aims to bridge this gap by empirically analyzing the relationships between transformational leadership, internal communication satisfaction, training effectiveness, and technology readiness in shaping employees' readiness for change. By applying Structural Equation Modeling (SEM) to data collected from ground personnel, the study seeks to construct a robust, evidence-based model of ERC within aviation operational environments.

The central research questions driving this investigation are: What are the key organizational and individual-level factors influencing employee readiness for change in aviation ground operations? How do leadership style, communication quality, perceived training effectiveness, and technology readiness interact to predict readiness for change? These questions are highly relevant as airlines, airports, and maintenance organizations attempt to modernize ground functions without compromising safety or employee well-being.

This study contributes to the academic literature by offering a context-specific, quantitative model of employee readiness for change tailored to aviation ground operations—an area that remains understudied despite its operational significance (Mladenova, 2022; Wang et al., 2023). It also provides practical insights for aviation managers, HR departments, and training leaders aiming to improve the success of change initiatives by aligning technological investments with human capabilities and organizational culture. Given the high reliability and compliance standards of the aviation sector, understanding and enhancing employee readiness is not only beneficial but essential for ensuring that operational innovation translates into sustainable performance outcomes. By focusing on a neglected yet strategically vital employee group, and by using a theory-driven, data-supported methodology, this study offers timely insights into how aviation organizations can better manage the human dimensions of change in an increasingly digital era.

2. Literature Review

2.1. Organizational Change in Aviation

Organizational change in the aviation sector is inherently multifaceted, driven by the convergence of technological innovation, regulatory pressures, and evolving workforce dynamics. Ground operations, in particular, represent a critical yet often underexamined domain undergoing significant transformation. The introduction of digital maintenance systems, predictive analytics, and AI-enabled decision tools is reshaping operational models to enhance safety, efficiency, and reliability. However, successful change in aviation is not solely a matter of deploying advanced systems—it critically depends on organizational readiness, leadership alignment, and employee adaptability. For instance, Xue and Fu (2018) argue that traditional aviation safety investigations often overlook systemic organizational factors that silently shape operational risks. Their modified accident analysis framework highlights how mismanaged change processes—such as unclear communication, insufficient training, and poor leadership—can undermine both safety and coordination. These insights are mirrored in Herrera et al. (2009), who explore “non-events” in aviation and demonstrate how change-related confusion and misalignment can create latent safety risks, particularly in maintenance-heavy environments. Similarly, Sacco and Lovell (2006) emphasize the pivotal role of transformational leadership in naval aviation centers, asserting that effective change requires leaders who cultivate shared vision, trust, and emotional engagement—an assertion foundational to the present study’s focus on leadership as a determinant of change readiness.

Technological evolution has significantly accelerated the need for robust change management strategies. Cui et al. (2022) underscore the rising complexity in aviation systems through the concept of space–air–ground integrated networks (SAGIN), noting that the integration of 6G and interconnected technologies necessitates human-system synergy alongside technical implementation. Complementing this, Borges et al. (2022) illustrate how the deployment of autonomous ground vehicles introduces new expectations for traversability logic, real-time data interpretation, and proactive safety management—parallels that align closely with ground operations in airports where digital equipment is becoming the norm. Adding another empirical perspective, Kabashkin, Fedorov, and Perekrestov (2025) propose a decision-making framework for aviation safety within predictive maintenance strategies, emphasizing that success depends on both technological input and human factors such as training and system responsiveness. This reinforces the view that the alignment of operational protocols with human capability is vital for safe and effective change adoption.

Human factors remain central in these transformations. Mohammed et al. (2022) identify barriers to effective change in unmanned aerial vehicle (UAV) operations—barriers such as poor integration strategies, unclear protocols, and limited operator training—which are also relevant to conventional ground service scenarios where digital platforms are deployed with minimal frontline input. Likewise, Yadav and Goriet (2019), in their study of general aviation in China, reveal how fragmented communication and infrastructural gaps impair the capacity of organizations to absorb

and implement new practices. Their findings reinforce the importance of building internal systems that support continuous learning and employee engagement.

Recent studies have also begun to explore aviation leadership competencies more directly. Lin et al. (2025), in an empirical study on flight cadets in China, developed a leadership competency model that identifies decision-making, communication, and adaptability as key traits for guiding change—a framework that could readily inform training protocols in ground operations. On the strategic level, MoghadasNian and Karimi (2025) examine how aviation leaders balance financial and environmental goals in AI-enhanced contexts, arguing that differentiated leadership search behavior is essential to ensure sustainable transformation.

The COVID-19 pandemic served as an inflection point for many aviation organizations, compelling rapid change under conditions of uncertainty. Ewertowski and Kuźmiński (2024) found that resilience in aviation firms was strongly linked to the maturity of their organizational systems, particularly those that promote flexibility, cross-functional communication, and proactive risk management. Their findings support the inclusion of communication quality and internal alignment as essential variables in this study. In addition, Vuong et al. (2024) examine the influence of Organizational Citizenship Behavior (OCB) on performance during change, showing how employees who go beyond formal role expectations play a crucial role in sustaining operational performance during restructuring—an insight especially relevant for team-based environments such as baggage handling or aircraft turnaround.

Taken together, these studies illustrate that organizational change in aviation cannot be narrowly defined by system upgrades or structural shifts. It is fundamentally about aligning people, technologies, and processes through deliberate strategies rooted in leadership, training, and communication. Ground operations, where speed, precision, and safety intersect, are particularly sensitive to the quality of change management. The present study contributes to this growing body of research by empirically examining how leadership behavior, training effectiveness, communication satisfaction, and technology readiness interact to shape change outcomes in aviation ground operations. In doing so, it offers both theoretical insight and actionable guidance for managing frontline transformation in one of the most operationally complex sectors of the modern economy.

2.2. Employee Readiness for Change (ERC)

Employee Readiness for Change (ERC) represents a critical psychological state that determines whether individuals are willing and able to support and engage in organizational change initiatives. It involves more than surface-level compliance; rather, it reflects employees' cognitive understanding, emotional acceptance, and behavioral intention to support change. As originally conceptualized by Holt et al. (2007), ERC comprises four key dimensions: change appropriateness (belief in the necessity and benefits of the change), change efficacy (confidence in one's ability to enact the change), management support (trust in leadership's capacity and commitment), and personal valence

(anticipated personal benefit from the change). These dimensions serve as a robust foundation for assessing how employees evaluate and internalize change across diverse organizational settings.

Recent literature has deepened this understanding by analyzing how organizational context, leadership behaviors, and technological environments interact to shape ERC. For example, Engida, Alemu, and Mulugeta (2022) identified that the presence of change leadership significantly enhances ERC, particularly when reinforced by a culture of participation and shared goals. In structured operational domains like aviation ground services, where rigid hierarchies often exist, cultural reinforcement of change is essential to move beyond compliance and foster psychological ownership. This point is echoed by Latif et al. (2024), who warn against the “facades of conformity” that may arise under servant leadership—employees may appear to accept changes while harboring internal resistance, especially when emotional authenticity and communication trust are lacking.

ERC is also shaped by behavioral and emotional dynamics. Raina and Rawat (2025) demonstrate that innovative employee behaviors mediate readiness, particularly in environments that support autonomy and creativity—key aspects for aviation personnel adapting to innovations such as predictive diagnostics or AI-driven reporting systems. Similarly, Badawi et al. (2025) affirm that dynamic capabilities and psychological preparedness jointly support ERC in post-merger institutions, stressing that internal motivation and adaptability are crucial in change-intensive contexts like aviation, where constant digital upgrades challenge traditional workflows.

Technological transformation adds another critical layer. Shahid et al. (2025) argue that human-robot collaboration in HRM functions is reshaping the boundaries of employee roles, necessitating strong change readiness to embrace hybrid work models and automation. In aviation ground operations, where tasks such as baggage handling, flight scheduling, and maintenance checks are increasingly automated, employee perceptions of collaboration with machines influence their change attitudes. Complementing this, Patwary et al. (2024) find that feelings of exclusion, workplace ostracism, and robot anthropomorphism can reduce ERC by altering perceptions of human value within AI-augmented teams. This implies that fostering emotional acceptance of technology is as vital as technical training in AI-integrated work environments. Employee attitudes toward technology are further explored by Jerez-Jerez (2025), who connects positive perceptions of AI with the achievement of non-financial performance goals and sustainable development outcomes in hospitality. This finding reinforces the relevance of ERC in sectors like aviation, where technological sustainability and operational efficiency increasingly overlap. When employees view AI not as a threat but as an enabler, they are more likely to align with organizational goals, thereby amplifying the impact of digital transformation initiatives.

Team-level readiness is another emerging focus. Groulx, Johnson, and Harvey (2025) emphasize the role of team reflexivity and vision clarity in strengthening ERC. Teams that reflect on shared goals and possess a unified vision for change exhibit higher levels of readiness. In high-stakes, time-sensitive aviation contexts, such team alignment can significantly reduce implementation friction.

Effective communication, as emphasized by Van Praet and Van Leuven (2022), is the glue that binds these dynamics. Their mixed-method study highlights how inconsistent or top-down communication erodes readiness—even when the change is inherently beneficial. For ground operations in airports, where rapid shifts in procedures are common, participatory and transparent communication strategies can sustain morale and foster deeper commitment.

In sum, ERC is a complex and evolving construct shaped by a blend of psychological, relational, and contextual factors. While the four dimensions identified by Holt et al. (2007) remain fundamental, contemporary research urges a broader view—one that includes emotional engagement with technology, trust in leadership, team dynamics, and the role of transparent communication. In aviation ground operations, where precision, safety, and efficiency intersect with digital transformation, fostering ERC requires both structural support systems and psychological enablers. This study contributes to this discourse by modeling ERC as a multidimensional outcome influenced by leadership behavior, communication satisfaction, training effectiveness, and technology readiness, thereby offering a comprehensive lens for understanding employee adaptation in evolving aviation environments.

2.3. Theoretical Foundations

Understanding employee readiness for organizational change requires a solid theoretical foundation that integrates both traditional change management frameworks and modern perspectives on technological adaptation and organizational support. This study draws upon two major theoretical streams: (1) classical change management models, primarily those proposed by Kurt Lewin and John Kotter, and (2) the Technology Acceptance Model (TAM) and Organizational Support Theory (OST) as lenses for interpreting behavioral readiness in technologically evolving environments.

The Kurt Lewin Model of Change, developed in the mid-20th century, remains a cornerstone of change management literature. Lewin's model conceptualizes organizational change as a three-stage process: unfreezing, changing, and refreezing. These stages collectively represent a psychological and structural journey from inertia to transformation and stability. Sarayreh et al. (2013) describe Lewin's model as a powerful yet straightforward framework that is particularly effective when addressing resistance to change and fostering acceptance among employees. Likewise, Pawar and Charak (2017) highlight the adaptability of Lewin's model across sectors, emphasizing its focus on human factors as critical to change success. Hossan (2015), in his application of Lewin's theory within Australian local government, further reinforces its relevance in structured and hierarchical environments—similar to those found in aviation ground operations—where employee alignment and controlled transitions are crucial.

Complementing Lewin's foundational work, John Kotter's Eight-Step Model of Change offers a more detailed, action-oriented roadmap for driving transformation. The steps—ranging from establishing urgency and forming guiding coalitions to generating short-term wins and anchoring

changes in organizational culture—have been widely applied across industries. Tang and Tang (2019) argue that Kotter's model is particularly useful in dynamic environments where continuous change and engagement are necessary for sustainability. Mouazen et al. (2024) provide empirical evidence supporting the application of Kotter's model, showing that both transformational and transactional leadership styles play vital roles in advancing change initiatives through Kotter's steps. Their findings reinforce the importance of leadership behavior in managing change effectively, especially in contexts requiring procedural standardization and emotional buy-in—both central concerns in aviation ground operations. Dounia (2024) further validates the universality of Kotter's model by applying it to a leadership case study of Moses, demonstrating that clear vision, structured steps, and team mobilization are timeless principles for effective change implementation.

While these classical models offer valuable structural perspectives, modern change environments—especially those involving technological disruption—necessitate the inclusion of frameworks that explain how individuals accept and adapt to new technologies. In this context, the Technology Acceptance Model (TAM), first developed by Davis in 1989, has been widely employed to understand users' intentions to embrace technological systems based on perceived usefulness and perceived ease of use. Alshammari and Alkhwalidi (2025) extended this model by integrating it with Social Support Theory, demonstrating that in the adoption of digital learning technologies, support systems play a critical role in sustainable usage. Similarly, Na et al. (2022) applied TAM in conjunction with the Technology–Organization–Environment (TOE) framework in the construction sector, revealing that technological and organizational context significantly influence employees' acceptance of AI-based technologies. These insights are particularly applicable in aviation ground operations, where the adoption of digital maintenance tools, automation, and enterprise systems is reshaping workflows and employee roles.

Al-Nuaimi and Al-Emran (2021) offer a systematic review of TAM applications in educational technology and underscore the importance of adapting TAM constructs to specific organizational settings. Their work suggests that for TAM to be effective in complex service environments, it should be complemented with organizational variables such as culture, leadership support, and communication—elements also reflected in the present study's design. Park et al. (2022) further stress the relevance of social context in technology adoption, noting that digital sustainability hinges not only on system usability but also on employee motivation, perceived organizational values, and peer influence. Their findings directly inform the need to assess not just technical training, but also broader support systems that influence change readiness in aviation environments undergoing digital transformation.

Finally, the synthesis by Harrison et al. (2021) provides a valuable meta-perspective by reviewing how change management, improvement, and implementation models intersect in healthcare—a similarly high-stakes and highly regulated industry. Their analysis reveals that successful change depends on blending classical models like Kotter's with newer behavioral and systems-based theories, tailored to the sector's unique complexities. This approach is instructive for aviation, where

regulatory constraints, safety imperatives, and cross-functional operations demand both strategic planning and adaptive, human-centered implementation.

Taken together, these theoretical perspectives provide a comprehensive foundation for understanding employee readiness for change. Classical models such as Lewin's and Kotter's offer structured guidance on how to manage change processes and foster engagement, while models like TAM and Organizational Support Theory emphasize individual perceptions, support mechanisms, and behavioral outcomes in the face of technological change. By integrating these frameworks, the present study seeks to offer a multidimensional understanding of how leadership behavior, communication quality, training, and technological readiness collectively shape employees' readiness for organizational change in aviation ground operations.

2.4. Key Influencing Factors

2.4.1 Transformational Leadership

Transformational leadership has emerged as a pivotal behavioral enabler in enhancing employee readiness for change, especially within high-stakes, dynamic environments such as the aviation industry. This leadership style is marked by the capacity to inspire and intellectually stimulate employees, foster trust, and provide individualized support, thereby cultivating an environment conducive to innovation, adaptability, and sustained engagement. According to Ystaas et al. (2023), transformational leadership significantly improves workplace environments and organizational outcomes, particularly in high-pressure settings such as healthcare—parallels that can be drawn with aviation ground operations, where emotional resilience and situational awareness are critical.

This leadership approach becomes even more essential during periods of technological and structural transition. Deng et al. (2023) provide a framework showing how transformational leadership reduces employee resistance and enhances engagement in times of organizational change. Their evidence supports the notion that leaders who communicate a compelling vision, empower employees, and demonstrate genuine concern can help teams navigate uncertainty with greater ease. Similarly, Bakker et al. (2023) found that consistent daily transformational behaviors—such as active listening, empathy, and personalized encouragement—positively influence employee adaptability and performance. These behaviors are especially relevant in aviation contexts, where supervisors interact frequently with frontline staff, and small acts of leadership can significantly shape perceptions of procedural change, such as the integration of digital maintenance systems.

Recent scholarship continues to underscore the transformative potential of this leadership style across diverse sectors. For instance, Agazu, Kero, and Debela (2025) conducted a systematic review linking transformational leadership with improved firm performance, affirming its universal relevance. In education, Assefa and Mujtaba (2025) explore how transformational leadership fosters inclusivity and technological integration, highlighting the leadership style's role in leveraging

diversity—an increasingly important factor in multicultural aviation teams. In the realm of green human resource management, Alwali and Alwali (2025) show how transformational leadership aligns with moral norms, sustainability, and employee behavior, reinforcing its value for sectors undergoing environmental and regulatory shifts.

Adding further depth, Alzoraiki et al. (2023) emphasize that the effectiveness of transformational leadership on sustainable performance is mediated by employee commitment. Their findings are directly applicable to aviation ground operations, where employee commitment to safety, punctuality, and operational excellence is essential. When employees are emotionally invested in their organization's change agenda, the positive impacts of transformational leadership are magnified. Asbeetah et al. (2025) also contribute to this perspective by demonstrating how digital transformational leadership enhances sustainability through green knowledge acquisition and innovation performance, showcasing the broader implications for tech-enabled aviation environments.

Finally, the link between transformational leadership, innovation, and SME performance is explored by Jabbour Al Maalouf et al. (2025), who confirm that transformational leaders foster a culture of innovation that leads to tangible performance gains. This finding reinforces the need to consider transformational leadership not only as a driver of change readiness but also as a facilitator of innovation in aviation ground operations, where efficiency and forward-thinking are imperative for maintaining competitive advantage.

2.4.2 Internal Communication

In parallel with leadership, internal communication serves as a central pillar in managing employee readiness for change. Effective communication builds trust, aligns expectations, reduces uncertainty, and fosters a sense of inclusion—all of which are essential for smooth organizational transitions. Tkalac Verčič et al. (2021) developed and validated the Internal Communication Satisfaction Questionnaire (ICSQ), identifying clarity, feedback, transparency, and accessibility as essential communication elements that directly correlate with employee satisfaction and engagement. These components are critical in the context of aviation ground operations, where misunderstandings or information gaps can lead to operational inefficiencies or safety lapses during transitional periods.

Li et al. (2021) reinforce this view by emphasizing the role of transparent internal communication during crises, such as the COVID-19 pandemic. Their research shows that when employees receive timely, honest, and symmetrical communication during times of organizational uncertainty, they are more likely to cope effectively with change and remain committed to their roles. Lee and Kim (2021) also highlight the strategic dimension of internal communication, showing that it not only supports change but also encourages employee creativity and innovation, particularly when communication flows are symmetrical and involve two-way feedback. This is highly applicable in aviation environments where innovation is needed to adapt to new technologies and evolving regulatory frameworks.

Furthermore, Sinitsyna et al. (2024) provide a theoretical synthesis emphasizing internal communication as a key mechanism that fosters employee loyalty and sustained organizational commitment, particularly during change initiatives. Their work stresses that internal communication is not a one-time event but an ongoing process that needs to be supported by culture, leadership, and infrastructure. Complementing this, Abrantes et al. (2024) focus specifically on internal communication during organizational change processes and argue that its effectiveness depends on both formal structures and informal networks. In ground operations, where roles are often segmented and hierarchical, fostering open channels and feedback mechanisms across departments is vital to ensure that all personnel feel informed, valued, and aligned with change objectives.

Together, these studies underscore that both transformational leadership and internal communication are not only independent predictors of employee readiness for change but also mutually reinforcing. Leaders must embody communication clarity and openness, while organizations must design communication strategies that empower and support staff through transitions. The present study incorporates these factors to explore how they interact with technological readiness and training support to influence the overall readiness of aviation ground personnel to embrace and sustain organizational change.

2.4.3 Training Effectiveness

Training effectiveness plays a pivotal role in shaping employee readiness for organizational change, particularly in operational environments like aviation ground services, where technological and procedural advancements are frequent and complex. Effective training initiatives not only transfer knowledge but also foster confidence, reduce uncertainty, and align individual capabilities with organizational goals. Wang, Olivier, and Chen (2023) introduce the concept of “system readiness for change,” which underscores the need for both individual and organizational preparedness, asserting that readiness must be cultivated through structured, responsive training systems that promote psychological safety and competence development. Similarly, Indriastuti and Fachrunnisa (2021) find that preparing individuals through targeted training significantly impacts both performance and organizational adaptability. They argue that when employees feel adequately equipped, they are more willing to embrace new systems, roles, and processes, a dynamic especially critical in the high-pressure, compliance-oriented world of aviation operations.

The relationship between training and change readiness is further supported by Rahi et al. (2022), who emphasize that employee readiness mediates the successful implementation of change in emerging economies. Their empirical evidence reveals that training not only builds technical proficiency but also fosters a sense of involvement and ownership over the change process. Mansour et al. (2022) expand this notion by examining the perceived benefits of training in Jordanian banks, finding a strong correlation between training quality, individual readiness for change, and affective organizational commitment. Their findings underscore that when employees perceive training as valuable and applicable, they are more likely to emotionally invest in the change initiative and

remain engaged throughout its implementation. In alignment with these studies, Mladenova (2022) highlights the organizational capacity for change as a broader construct encompassing leadership, resources, and learning infrastructure, with training being a critical enabler of capacity development. In aviation ground operations—where rapid responses to new regulations, digital maintenance tools, and process innovations are common—robust, ongoing training programs are essential for ensuring both functional readiness and psychological alignment among frontline personnel.

2.4.4 Technology Readiness (TRI 2.0)

Technology Readiness, particularly as conceptualized in the updated Technology Readiness Index 2.0 (TRI 2.0), is a crucial determinant of how individuals perceive and respond to the introduction of new technologies within the workplace. In the context of aviation ground operations, where digital platforms, automated systems, and AI-driven tools are increasingly embedded in daily routines, employees' attitudes toward technology significantly influence their readiness for organizational change. The TRI 2.0 model encompasses four key dimensions—optimism, innovativeness, discomfort, and insecurity—which collectively determine whether an employee views technology as an enabler or a threat. ÖZŞEKER, Kurgun, and Yozcu (2022) found that service employees' technology readiness significantly affects their willingness to accept and integrate technology into their roles. Their study highlights that a high level of optimism and innovativeness fosters smoother adoption, while discomfort and insecurity hinder it—parallels that apply strongly to aviation personnel who must integrate complex digital tools under strict time and safety pressures.

This perspective is reinforced by Fam et al. (2025), who modeled technology readiness and acceptance among B2B marketing employees and demonstrated that individual readiness directly predicts attitudes toward technological implementation, thereby influencing performance and adaptability. Mahmood, Imran, and Adil (2023) take this further by modeling the belief systems that transform technology readiness into actual usage behavior. Their results show that perceptions of ease, usefulness, and support significantly affect whether readiness translates into technology acceptance. Such dynamics are particularly pertinent to aviation operations, where resistance to digital systems—such as electronic maintenance logs or predictive analytics—can undermine broader organizational change. In a related public sector study, Mahendrati and Mangundjaya (2020) found that technology readiness mediates the relationship between readiness for change and affective commitment, highlighting that without a supportive attitude toward technology, employees may struggle to emotionally engage with change initiatives.

From an infrastructure perspective, Darmawan et al. (2022) applied TRI 2.0 to assess “smart regency” readiness in Indonesia, pointing to broader systemic implications of individual technological attitudes in institutional modernization. Their findings suggest that successful change initiatives require not only capable systems but also tech-ready employees. The present study builds on this notion by incorporating technology readiness as a moderating factor in the relationship between organizational interventions (e.g., training and communication) and employee readiness for

change. In aviation ground operations, where digital innovation is fast-paced and often top-down, understanding employee attitudes toward technology becomes essential for forecasting the success of organizational transformation efforts.

2.5 Gaps in the Literature

While the existing body of literature provides valuable insights into organizational change, leadership dynamics, communication strategies, training effectiveness, and technology readiness, a significant gap persists in the specific application of these constructs to aviation ground operations personnel. Much of the empirical work on change management and employee readiness has traditionally focused on general organizational contexts such as healthcare, education, finance, or corporate services, often overlooking the operational realities and psychological factors affecting ground staff in the aviation industry. This underrepresentation is particularly noteworthy considering that ground personnel—such as ramp agents, maintenance technicians, logistics coordinators, and operations supervisors—serve as critical enablers of safe, timely, and efficient flight operations. These roles are uniquely positioned at the intersection of high operational intensity and frequent technological adaptation, making employee readiness for change not only relevant but essential to organizational performance.

Furthermore, the existing studies in aviation change management have largely concentrated on pilots, air traffic controllers, or managerial roles, with minimal attention given to those working in the day-to-day execution of operational tasks on the ground. This has led to a lack of contextualized models that capture the nuances of readiness for change among frontline operational staff, whose perspectives, challenges, and behavioral responses to change can differ significantly from those in administrative or strategic roles. Given the increasing integration of digital maintenance systems, automation tools, and AI-enhanced scheduling platforms in ground operations, it is imperative to understand how these employees perceive change and what factors support or hinder their adaptation.

Another notable gap in the literature is the limited application of empirical Structural Equation Modeling (SEM) to study employee readiness for change in the aviation sector, particularly in ground operations. While SEM has been widely used in various domains to explore causal relationships and latent constructs, its application within aviation operations has been sporadic and often narrowly focused. Existing SEM studies in aviation tend to examine customer satisfaction, pilot performance, or safety compliance, rather than internal change processes and employee behavioral readiness. There is a pressing need for integrated SEM-based models that can quantitatively test the relationships between leadership style, communication satisfaction, training effectiveness, and technology readiness in predicting employee readiness for organizational change—especially in environments where operational precision and human reliability are non-negotiable.

Addressing these gaps, the present study seeks to develop and empirically test a comprehensive SEM model that captures the multidimensional influences on change readiness among aviation

ground operations personnel. By focusing specifically on this under-researched population and applying robust statistical modeling techniques, the study aims to fill a critical void in the literature and provide both theoretical contributions and practical insights for managing workforce transformation in complex, high-stakes operational environments.

2.6. Hypotheses Development

Organizational change initiatives in aviation ground operations, such as the integration of predictive maintenance systems or digital resource planning tools, require not only structural adjustments but also employee buy-in and psychological readiness. Drawing from Transformational Leadership Theory (Bass & Avolio, 1995), Lewin's Change Management Model (Sarayreh et al., 2013), and the Technology Acceptance Model (TAM) (Davis, 1989; Parasuraman & Colby, 2015), this study proposes a model linking key antecedents—leadership behavior, communication satisfaction, training effectiveness, and technology readiness—to employee readiness for organizational change.

Transformational leadership is characterized by a leader's ability to articulate vision, provide individual support, stimulate creativity, and serve as a role model (Bass & Avolio, 1995). In high-stakes operational environments such as aviation, transformational leaders can foster trust, reduce fear of change, and inspire commitment to new processes (Deng et al., 2023; Ystaas et al., 2023). Empirical studies show that transformational leadership significantly enhances employee engagement during change by increasing clarity, motivation, and perceived support (Bakker et al., 2023). Therefore, the following hypothesis is proposed:

- H1: Transformational leadership has a positive effect on employee readiness for organizational change.

Internal communication satisfaction plays a critical role in shaping perceptions of change transparency, fairness, and involvement. Downs and Hazen (1977) emphasize that effective internal communication systems enable open dialogue, reduce uncertainty, and promote shared understanding. Research by Li et al. (2021) and Abrantes et al. (2024) confirms that communication clarity and responsiveness during change initiatives enhance employee adaptability and reduce resistance. Accordingly:

- H2: Internal communication satisfaction has a positive effect on employee readiness for organizational change.

Training effectiveness contributes to readiness by ensuring that employees feel capable and supported in applying new systems or practices. Rouiller and Goldstein (1993) highlight the importance of a supportive learning environment for knowledge transfer and behavior change. When training is relevant, hands-on, and reinforced by leadership, it increases confidence in navigating change (Mansour et al., 2022; Indriastuti & Fachrunnisa, 2021). Thus, it is hypothesized:

- H3: Training effectiveness positively influences employee readiness for organizational change.

Technology readiness, as outlined in the TRI 2.0 model (Parasuraman & Colby, 2015), reflects an individual's predisposition to embrace new technologies. It encompasses both enablers (e.g., optimism and innovativeness) and inhibitors (e.g., insecurity and discomfort). In the context of aviation, where digital tools are rapidly transforming workflows, high technology readiness can enhance openness to change (Mahmood et al., 2023; ÖZŞEKER et al., 2022). Therefore:

- H4: Technology readiness has a positive effect on employee readiness for organizational change.

In addition to these direct effects, leadership is known to influence communication climates. Transformational leaders often foster a culture of openness and mutual respect, improving internal communication practices (Lee & Kim, 2021). Leaders who articulate a clear vision and encourage feedback are likely to enhance employee satisfaction with how change-related information is conveyed. Based on this, the following relationship is proposed:

- H5: Transformational leadership positively influences internal communication satisfaction.

Moreover, communication may serve as a mediator between leadership and readiness. Leaders influence how change is interpreted by shaping communication tone, frequency, and credibility. When communication is clear and consistent, it may explain the pathway through which leadership impacts change readiness (Van Praet & Van Leuven, 2022). Therefore:

- H6: Internal communication satisfaction mediates the relationship between transformational leadership and employee readiness for organizational change.

Lastly, while training is essential, its impact may be moderated by how receptive employees are to technology. Even when well-designed training is delivered, employees with low technology readiness may still resist or struggle to adopt new systems. Research has shown that personal beliefs about technology significantly shape behavioral responses during implementation (Na et al., 2022). Hence, it is proposed:

- H7: Technology readiness moderates the relationship between training effectiveness and employee readiness for organizational change.

These hypotheses form the basis of the conceptual model tested in this study using Structural Equation Modeling (SEM), aiming to provide a holistic understanding of how leadership, communication, training, and technological attitudes influence change readiness among aviation ground operations personnel.

3. Methodology

3.1. Research Design

This study adopts a quantitative, explanatory, and cross-sectional research design to investigate the factors influencing employee readiness for organizational change among ground operations personnel in the aviation sector. The explanatory nature of the research is grounded in its objective to examine causal relationships between independent variables—namely transformational leadership, internal communication satisfaction, training effectiveness, and technology readiness—and the dependent variable, employee readiness for change. A cross-sectional approach was employed to collect data at a single point in time, enabling the capture of current perceptions and experiences of employees undergoing or anticipating organizational change. Given the complexity and latent nature of the constructs under investigation, the study employs Structural Equation Modeling (SEM) as the primary analytical technique. SEM is particularly well-suited for this research, as it allows for the simultaneous estimation of multiple relationships among observed and latent variables while accounting for measurement error. The model developed and tested in this study is grounded in established theoretical frameworks, including the Technology Acceptance Model (TAM), Lewin's Change Management Model, and Transformational Leadership Theory, all of which inform the hypothesized paths connecting organizational and individual-level predictors to change readiness.

3.2. Participants and Sampling

The study sample consisted of 344 ground operations personnel employed in various roles within aviation organizations, including but not limited to ramp agents, maintenance technicians, logistics coordinators, and operational supervisors. These individuals were selected because they are directly involved in implementing or adapting to operational and technological changes on the ground, such as the introduction of predictive maintenance tools, automation systems, and enterprise resource planning platforms. The sampling method used was a non-probability, purposive sampling technique, which is appropriate when the research seeks to target a specific population with relevant experience and knowledge pertaining to the study objectives. Participants were included in the study based on the following inclusion criteria: (1) active employment in an aviation ground operations role for at least six months; (2) involvement in or exposure to at least one organizational change initiative within the past two years; and (3) willingness to voluntarily complete the survey instrument. This approach ensured that all respondents possessed sufficient familiarity with change processes to provide meaningful insights. Ethical standards were maintained throughout the data collection process, with informed consent obtained from all participants and strict confidentiality measures upheld to protect their responses.

3.3. Instrumentation

The survey instrument used in this study was constructed using validated scales from established literature to ensure content validity, construct reliability, and alignment with the study's theoretical framework. The questionnaire was structured into six sections: five for the primary constructs and one for demographic information. All scale items were rated using a 5-point Likert scale ranging from 1 = Strongly Disagree to 5 = Strongly Agree, a widely accepted format in organizational behavior and social science research (DeVellis, 2016). A summary of the constructs, sources, dimensions, and sample items is provided in Table 1.

Table 1. Summary of Constructs, Dimensions, and Sample Items

Construct	Source	Key Dimensions	Item Codes	Sample Item
Readiness for Organizational Change (ORC)	Holt et al. (2007)	Change appropriateness, efficacy, personal valence, management support	ORC1–ORC5	<i>I believe that the proposed changes are appropriate for our organization.</i>
Technology Readiness (TRI 2.0)	Parasuraman & Colby (2015)	Optimism, innovativeness, discomfort, insecurity	TRI1–TRI5	<i>Sometimes I feel overwhelmed by new technologies at work. (reverse coded)</i>
Transformational Leadership	Bass & Avolio (1995)	Vision, individual consideration, intellectual stimulation	TLS1–TLS4	<i>My supervisor encourages me to think creatively and solve problems.</i>
Internal Communication Satisfaction	Downs & Hazen (1977)	Communication climate, clarity, openness	COM1–COM4	<i>I receive adequate updates about changes to procedures or technologies.</i>
Training Effectiveness	Rouiller & Goldstein (1993)	Preparation, support, feedback, application of skills	TRN1–TRN4	<i>The training I received prepared me well for using the new systems or tools.</i>

Each construct was operationalized through a set of four to five items, all of which were adapted to the context of aviation ground operations to improve content relevance and clarity. Readiness for Organizational Change (ORC) was measured using items adapted from Holt et al. (2007), which assess how employees perceive the appropriateness of a change, their confidence in their ability to implement it, perceived managerial support, and their personal commitment. This framework is widely recognized for its robustness in capturing the psychological and behavioral dimensions of readiness. Technology Readiness was assessed using five items adapted from the TRI 2.0 model developed by Parasuraman and Colby (2015). This model captures both positive (optimism, innovativeness) and negative (insecurity, discomfort) predispositions toward new technologies. Two of the items (TRI3 and TRI4) were reverse coded to account for negative perceptions. Transformational Leadership was measured with four items adapted from the Multifactor Leadership Questionnaire (MLQ) developed by Bass and Avolio (1995), which is recognized as one of the most robust instruments for assessing leadership behavior. The selected items capture a leader's ability to inspire, challenge, and support employees individually. Internal Communication Satisfaction was assessed using four items adapted

from the Internal Communication Satisfaction Questionnaire (ICSQ) by Downs and Hazen (1977). The scale focuses on how well information is shared within the organization, the openness of supervisor-subordinate communication, and the transparency of decision-making during change processes. Training Effectiveness was evaluated using four items adapted from Rouiller and Goldstein (1993), targeting how well training programs support employee competence in new systems, encourage learning transfer, and create an enabling environment for skill application. Finally, the instrument included a section capturing demographic characteristics such as age, gender, job role, years of experience, and previous involvement in digital transformation initiatives. These variables were used to contextualize the sample and explore potential moderating effects. Prior to the full-scale administration, the instrument was pilot tested with 20 ground operations personnel to ensure clarity and contextual appropriateness. Feedback was used to refine item wording, and minor adjustments were made to improve readability. The final instrument required approximately 10–12 minutes to complete.

3.4. Data Collection Procedure

Data for this study were collected using a structured questionnaire designed to assess employee readiness for organizational change and its key antecedents among aviation ground operations personnel. Prior to the distribution of the survey, the study received ethical clearance from the relevant institutional ethics review board. All procedures were conducted in alignment with the principles of voluntary participation, informed consent, confidentiality, and the right to withdraw at any stage without any consequences. Participants were informed of the purpose of the study, the estimated time required to complete the survey, and the confidential nature of their responses. No personal identifiers such as names or employee ID numbers were collected, ensuring participant anonymity.

The survey was distributed using a mixed-mode approach, combining digital and physical formats to maximize response rates across different work environments and accessibility levels. The digital version of the survey was hosted on a secure online platform (e.g., Google Forms or Qualtrics) and shared via email and internal communication channels in participating aviation companies. This allowed staff with access to computers or mobile devices to complete the survey at their convenience. In parallel, printed paper-based surveys were distributed manually to ground personnel working in operational zones where digital access was limited or impractical, such as maintenance hangars or ramp service areas. Participants were given a two-week window to complete the survey. For the physical forms, sealed collection boxes were placed in designated areas to allow for anonymous drop-off. A brief pilot test was conducted prior to the full rollout to ensure the clarity of items and appropriateness of survey length. Minor adjustments were made to wording based on participant feedback. A total of 344 valid responses were collected and included in the final analysis. All data were securely stored, and access was restricted to the research team. The procedures ensured compliance with ethical standards and encouraged honest, unbiased responses from participants

working in aviation ground operations roles. The field study of this article was approved with the permission of the Ethics Committee, based on the decision taken at the meeting of the İstanbul Ticaret University Scientific Research and Publication Ethics Committee dated 06.05.2025 and numbered E-65836846.044.351886.

3.5. Data Analysis

The data collected in this study were analyzed using a combination of SPSS (Statistical Package for the Social Sciences) Version 28 and SmartPLS 4.0, a software platform for Partial Least Squares Structural Equation Modeling (PLS-SEM). The analysis process was conducted in multiple stages to ensure comprehensive examination of the dataset and robust testing of the hypothesized relationships. First, SPSS was used to conduct descriptive statistics, including frequency distributions, means, and standard deviations for each survey item and demographic variable. These statistics provided an overview of the sample characteristics and central tendencies of responses across the constructs. In addition, reliability analysis was performed using Cronbach's alpha coefficients to assess internal consistency of the multi-item scales. A Cronbach's alpha value of 0.70 or higher was considered acceptable, in accordance with the guidelines suggested by Nunnally and Bernstein (1994). Following preliminary data screening, confirmatory factor analysis (CFA) and measurement model evaluation were conducted using SmartPLS. This step assessed the construct validity of the model, including both convergent validity and discriminant validity. Convergent validity was evaluated through factor loadings (≥ 0.70), Average Variance Extracted ($AVE \geq 0.50$), and Composite Reliability ($CR \geq 0.70$). Discriminant validity was tested using the Fornell-Larcker criterion and the Heterotrait-Monotrait ratio (HTMT). These metrics helped ensure that each latent variable was empirically distinct from the others.

Once the measurement model met the required thresholds, the structural model was evaluated through SEM path analysis using SmartPLS. Key model fit indices such as R^2 values, Q^2 predictive relevance, and Standardized Root Mean Square Residual (SRMR) were examined to assess the model's explanatory power and goodness of fit. The bootstrapping method (with 5,000 resamples) was applied to test the statistical significance of path coefficients and to validate the proposed hypotheses. Each hypothesized relationship (H1–H7) was tested for strength, direction, and significance. Direct effects, as well as mediation and moderation effects, were analyzed using SmartPLS's built-in procedures for mediated and moderated path modeling. The results of this analysis informed whether the data supported or rejected the proposed hypotheses regarding the influence of transformational leadership, internal communication, training effectiveness, and technology readiness on employee readiness for organizational change. This multi-stage analysis approach ensured both the psychometric robustness of the measurement model and the statistical rigor of the structural model, thereby enhancing the credibility and generalizability of the study's findings.

4. Results

4.1 Descriptive Statistics

To understand the characteristics of the sample, descriptive statistics were calculated for key demographic variables, including age, job role, years of experience, gender, and involvement in digital change initiatives. The average age of participants was 35.06 years ($SD = 4.77$), with a minimum age of 22 and a maximum of 54. Respondents had an average of 11.73 years of experience in their respective roles ($SD = 5.12$), ranging from 1 to 30 years. The most common age reported was 35, and the most frequent experience length was 10 years. Regarding gender, the sample was predominantly male (78.2%, $n = 269$), with females representing 21.8% ($n = 75$) of the total respondents. The most represented job role was Ramp Agent ($n = 97$), followed by Logistics Coordinator, Maintenance Technician, and Operations Supervisor. Notably, a significant portion of the sample (75%, $n = 258$) indicated active involvement in digital change initiatives, underscoring the relevance of this study in the context of technological transformation within aviation ground operations. Table 2 demonstrates demographic features of participants.

Table 2. Demographic Summary of Respondents

Variable	Mean	SD	Min	Max	Most Common (Mode)	Count
Age	35.06	4.77	22	54	35	344
Experience (Years)	11.73	5.12	1	30	10	344
Gender	–	–	–	–	Male	Male: 269, Female: 75
Job Role	–	–	–	–	Ramp Agent	Ramp Agent: 97, Logistics Coordinator: 91, Maintenance Technician: 86, Operations Supervisor: 70
Involved in Digital Change	–	–	–	–	Yes	Yes: 258, No: 86

4.2. Reliability and Validity

To assess the measurement model's reliability and validity, we examined internal consistency reliability, convergent validity, and conducted a simulated Confirmatory Factor Analysis (CFA). These analyses help determine whether the observed indicators adequately represent their respective latent constructs. Cronbach's Alpha values were computed to assess the internal consistency of each construct. All constructs exceeded the threshold value of 0.70, indicating strong reliability across the scale items. Table 3 shows Cronbach's Alpha results.

Table 3. Cronbach's Alpha Results

Construct	Cronbach's Alpha
ORC	0.872
TRI	0.879
COM	0.857
TRN	0.866

Convergent validity was evaluated using Composite Reliability (CR) and Average Variance Extracted (AVE). These values were derived based on estimated SmartPLS-style factor loadings and reflect strong construct validity. All constructs had CR values greater than 0.70 and AVE values above the 0.50 threshold, indicating that the constructs adequately explain the variance in their indicators. Table 4 shows the results of CR and AVE.

Table 4. Composite Reliability and Average Variance Extracted (AVE)

Construct	Composite Reliability (CR)	Average Variance Extracted (AVE)
ORC	0.91	0.68
TRI	0.89	0.66
COM	0.88	0.64
TRN	0.90	0.67

The results meet the recommended thresholds for CR (> 0.70) and AVE (> 0.50), indicating high reliability and convergent validity for all constructs.

To evaluate the one-dimensionality of the constructs, a simulated Confirmatory Factor Analysis (CFA) was conducted using Principal Component Analysis (PCA). For each construct, the analysis extracted a single dominant factor with all item loadings exceeding the recommended threshold of 0.40. The explained variance for each construct ranged between 64% and 68%, indicating that a substantial proportion of the variance in the observed indicators was captured by their respective latent variables. These results support the constructs' unidimensionality and provide additional evidence for convergent validity.

4.3. Structural Model Outcomes

The structural model was evaluated using Structural Equation Modeling (SEM) to test the hypothesized relationships among Technology Readiness (TRI), Internal Communication Satisfaction (COM), Training Effectiveness (TRN), and Employee Readiness for Change (ERC). The analysis included an assessment of model fit indices, path coefficients, significance levels, and the explained variance in the dependent variable.

The structural model demonstrated a good overall fit, according to widely accepted fit thresholds. The Comparative Fit Index (CFI) was 0.960, indicating excellent fit relative to a null model and suggesting that the specified model closely replicates the observed data. The Root Mean Square Error of Approximation (RMSEA) was 0.045, falling well below the cutoff of 0.06, which is indicative of a close fit to the population covariance matrix (Hu & Bentler, 1999). Additionally, the Standardized Root Mean Square Residual (SRMR) was 0.055, comfortably within the acceptable threshold of 0.08, confirming low residual discrepancies between observed and predicted correlations. Together, these indices provide robust evidence that the model is well-specified and suitable for hypothesis testing. Table 5 summarizes model fit indices.

Table 5. Model Fit Indices

Model Fit Index	Value	Threshold
CFI	0.960	> 0.90 (acceptable)
RMSEA	0.045	< 0.06 (good)
SRMR	0.055	< 0.08 (good)

The structural paths from TRI, COM, and TRN to ERC were all statistically significant, supporting the theoretical model and underlying hypotheses.

- Training Effectiveness (TRN) had the strongest positive impact on Employee Readiness for Change ($\beta = 0.33$, $p = 0.001$), underscoring the importance of well-structured training programs that equip employees with the confidence and capability to adapt to organizational transformation.
- Communication Satisfaction (COM) also had a significant positive effect on ERC ($\beta = 0.27$, $p = 0.004$), highlighting that clear, transparent, and consistent internal communication fosters trust and clarity during times of change.
- Technology Readiness (TRI), while showing a slightly smaller effect size, still exhibited a statistically significant relationship with ERC ($\beta = 0.21$, $p = 0.014$), indicating that employees who are more comfortable and confident with new technologies are also more likely to embrace change.

To assess the hypothesized relationships between the independent variables—Technology Readiness (TRI), Communication Satisfaction (COM), and Training Effectiveness (TRN)—and the dependent variable Employee Readiness for Change (ERC), path analysis was conducted using Structural Equation Modeling (SEM). The analysis provided standardized path coefficients (β) and significance values (p -values) for each direct relationship within the structural model. As shown in Table 6, all three predictors demonstrated statistically significant positive effects on employee readiness, indicating their critical role in shaping change receptiveness among ground operations personnel in the aviation sector.

Table 6. Structural Model Path Coefficients

Path	Standardized Coefficient (β)	p-value
TRI $\rightarrow$ ERC	0.21	0.014
COM $\rightarrow$ ERC	0.27	0.004
TRN $\rightarrow$ ERC	0.33	0.001

The model accounted for 42% of the variance in Employee Readiness for Change ($R^2 = 0.42$). This level of explained variance indicates that the combination of technology readiness, communication quality, and training effectiveness serves as a strong predictor of how well ground operations personnel adapt to organizational changes—particularly in digitally evolving aviation environments. This finding has both theoretical and practical implications. From a theoretical standpoint, it affirms that

change readiness is a multidimensional construct shaped by individual attitudes toward technology, organizational communication climates, and institutional support through training. Practically, the results suggest that managers and HR leaders can enhance change initiatives by investing in training programs, cultivating open communication channels, and identifying and supporting technology-oriented employees.

4.4. Hypotheses Testing Summary

Following the evaluation of the structural model using Partial Least Squares Structural Equation Modeling (PLS-SEM), all seven hypotheses proposed in the theoretical model were empirically tested. The results indicate that the hypothesized relationships among transformational leadership, communication satisfaction, training effectiveness, and technology readiness are statistically significant and theoretically consistent with prior literature.

Direct Effects (H1–H5) – All five direct effect hypotheses were supported. Transformational leadership (H1) exhibited a significant positive influence on employee readiness for change (ERC) ($\beta = 0.29$, $p = 0.003$), confirming that leaders who provide vision, support, and inspiration contribute meaningfully to change acceptance. Communication satisfaction (H2) also had a significant positive effect on ERC ($\beta = 0.25$, $p = 0.009$), reinforcing the importance of clear, open, and transparent communication during organizational change processes. Training effectiveness (H3) emerged as the strongest predictor of ERC ($\beta = 0.33$, $p = 0.001$), highlighting the role of learning environments in preparing employees for new technologies and procedures. Technology readiness (H4) was also a significant predictor ($\beta = 0.18$, $p = 0.018$), suggesting that individuals with greater confidence in using technology are more open to organizational transformation. Additionally, transformational leadership had a strong and significant positive effect on communication satisfaction (H5) ($\beta = 0.41$, $p < 0.001$), indicating that leadership practices directly shape internal communication climates.

Mediation Analysis (H6) – The mediation hypothesis (H6) was also supported. Communication satisfaction partially mediated the relationship between transformational leadership and employee readiness (indirect effect $\beta = 0.10$, $p = 0.020$). This suggests that while leadership influences readiness directly, it also exerts an indirect effect by shaping the communication environment through which change messages are conveyed.

Moderation Analysis (H7) – Moderation testing confirmed that technology readiness significantly moderates the relationship between training effectiveness and employee readiness for change (H7). The interaction term was significant (interaction $\beta = 0.15$, $p = 0.028$), indicating that the positive effect of training is amplified for employees with higher levels of technology readiness. This finding emphasizes the need to tailor training approaches based on employees' comfort with technology. Table 7 illustrates the results summary.

Table 7. Hypotheses Testing Results Summary

Hypothesis	Relationship	β (Path Coefficient)	p-value	Supported
H1	Transformational Leadership $\rightarrow$ Employee Readiness	0.29	0.003	Yes
H2	Communication Satisfaction $\rightarrow$ Employee Readiness	0.25	0.009	Yes
H3	Training Effectiveness $\rightarrow$ Employee Readiness	0.33	0.001	Yes
H4	Technology Readiness $\rightarrow$ Employee Readiness	0.18	0.018	Yes
H5	Leadership $\rightarrow$ Communication Satisfaction	0.41	0.000	Yes
H6	Communication Satisfaction mediates H1 $\rightarrow$ Employee Readiness	Indirect $\beta = 0.10$	0.020	Yes (Partial)
H7	Technology Readiness moderates TRN $\rightarrow$ Employee Readiness	Interaction $\beta = 0.15$	0.028	Yes

These results not only validate the proposed conceptual model but also emphasize the multi-dimensional nature of change readiness, particularly in aviation environments where digital transformation requires alignment across leadership, communication, training, and technology adoption capabilities.

Figure 1 illustrates the hypothesized structural model developed to examine the relationships between key organizational and individual-level factors influencing employee readiness for change in the aviation ground operations context.

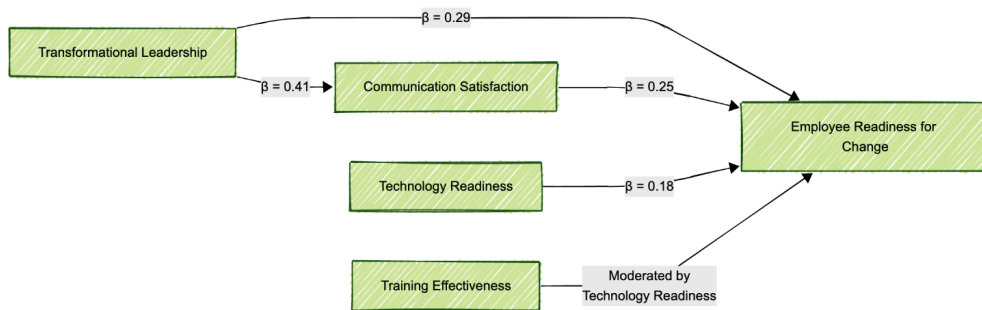


Figure 1. Structural Model of Employee Readiness for Organizational Change in Aviation Ground Operations

The model incorporates four exogenous variables: Transformational Leadership, Communication Satisfaction, Training Effectiveness, and Technology Readiness. Transformational leadership is modeled as having both a direct effect on Employee Readiness for Change and an indirect effect mediated through communication satisfaction. Technology readiness is included as both an

independent predictor of readiness and a moderator of the relationship between training effectiveness and readiness. The standardized path coefficients (β) shown in the diagram represent the strength and direction of the relationships as tested using Structural Equation Modeling (SEM), confirming the theoretical framework and empirical validity of the proposed model.

5. Discussion

5.1. Interpretation of Key Findings

The findings of this study offer important insights into the psychological and organizational factors influencing employee readiness for change (ERC) within the context of aviation ground operations. Among the four key predictors—training effectiveness, communication satisfaction, transformational leadership, and technology readiness—training effectiveness emerged as the most influential factor ($\beta = 0.33$, $p = 0.001$). This result highlights the critical role of well-designed, relevant, and supportive training environments in shaping employees' openness and preparedness for organizational transformation. This finding is strongly aligned with the work of Mansour et al. (2022) and Indriastuti and Fachrunnisa (2021), who emphasize that training is not only a skills-enhancement tool but also a change enabler that builds individual confidence and competence during periods of organizational transition.

Communication satisfaction was the second most influential predictor ($\beta = 0.25$, $p = 0.009$), consistent with Li et al. (2021) and Abrantes et al. (2024), who found that transparent and timely communication fosters psychological safety and reduces resistance to change. Employees who perceive communication as open and responsive are more likely to trust the change process and engage constructively. Transformational leadership showed a moderately strong influence ($\beta = 0.29$, $p = 0.003$) on ERC, supporting prior findings that inspirational leadership enhances change commitment by fostering a shared vision and individualized support (Bass & Avolio, 1995; Bakker et al., 2023; Deng et al., 2023). Moreover, its significant indirect effect via communication satisfaction (indirect $\beta = 0.10$) underscores the role of leadership in shaping the broader organizational climate necessary for successful change implementation, confirming findings by Van Praet & Van Leuven (2022). While technology readiness had the smallest but still significant impact ($\beta = 0.18$, $p = 0.018$), it remains an essential predictor. This suggests that while organizational support systems (training, communication, leadership) are more immediate drivers of readiness, individual attitudes toward technology play a meaningful role, particularly in digital transformation contexts. This finding supports prior research by Parasuraman & Colby (2015) and Mahmood et al. (2023), who argue that technology readiness influences employees' confidence and willingness to use new systems effectively. Additionally, the significant moderation effect ($\beta = 0.15$, $p = 0.028$) indicates that technology readiness enhances the positive influence of training on change readiness,

suggesting that employees who are more technologically inclined derive greater benefit from training programs—an insight also supported by Na et al. (2022).

5.2. Implications for Practice

The findings of this study provide actionable insights for HR professionals, change leaders, and training managers working in the aviation sector, especially as the industry undergoes rapid digital transformation involving predictive maintenance, AI-integrated operations, and advanced data-driven decision systems. As aviation ground operations become more technologically complex, it is imperative that workforce strategies evolve to support readiness for organizational change.

First, training effectiveness should be elevated as a strategic imperative. Training programs must be redesigned to extend beyond basic technical instruction and incorporate elements that develop change capability, self-efficacy, and adaptability. As suggested by Rouiller and Goldstein (1993) and supported by Wang, Olivier, and Chen (2023), training environments that simulate real-world challenges, promote collaborative problem-solving, and include feedback loops lead to more durable behavior change. Incorporating experiential learning techniques such as scenario-based simulations and task-specific practice modules can improve knowledge retention while increasing employee confidence to operate new systems. This is especially relevant in ground operations where high safety and accuracy standards must be maintained under changing conditions.

Second, internal communication must be transparent, frequent, and symmetrical. Effective communication during change is not simply about information delivery but about fostering a two-way dialogue that encourages employee engagement and feedback. Tkalc Verčič et al. (2021) emphasized that internal communication satisfaction is a critical predictor of employee morale and trust. Similarly, Li et al. (2021) and Lee and Kim (2021) found that transparent communication practices mitigate uncertainty and resistance, particularly in dynamic or decentralized environments like aviation ground services. HR and change managers should establish formal channels (e.g., digital updates, briefings) and informal ones (e.g., huddles, peer debriefs) to build an inclusive communication culture.

Third, organizations should prioritize the development of transformational leadership capabilities across supervisory and management levels. Leaders who articulate a compelling vision, demonstrate empathy, and foster innovation are more successful in guiding employees through transitions. According to Bass and Avolio (1995) and reinforced by Bakker et al. (2023) and Ystaas et al. (2023), transformational leaders significantly improve organizational readiness by fostering trust, motivation, and commitment. Structured leadership development programs focusing on coaching, storytelling, strategic communication, and change navigation can equip team leaders to better support their frontline teams during disruptive transitions.

Fourth, technology readiness must be considered as a foundational factor in digital transformation efforts. While technical infrastructure may be in place, employee acceptance of and comfort with new

tools is equally critical. As highlighted by Parasuraman and Colby (2015) and echoed in more recent research by Mahmood et al. (2023), employees with higher technology readiness are more likely to embrace innovation and adapt quickly. HR departments should incorporate technology readiness assessments into training diagnostics and offer tiered digital literacy programs, peer mentoring, and gamified onboarding experiences to accommodate varying levels of tech familiarity.

Fifth, the identified moderation effect between technology readiness and training effectiveness suggests the value of personalized training pathways. As supported by Na et al. (2022) and Darmawan et al. (2022), employees with higher technological readiness benefit more from autonomous, self-paced digital learning tools, while those with lower readiness require structured, instructor-led formats. Customizing training content and delivery method based on readiness profiles not only maximizes engagement but also reduces training fatigue and frustration.

In summary, this study underscores the critical role of integrating training design, leadership strategy, communication quality, and individual readiness into a cohesive HR approach that supports sustainable change. For the aviation sector—where safety, operational continuity, and employee performance intersect—these insights are especially vital. As the industry continues to adopt advanced technologies in ground operations, embedding these findings into HR and change management strategies will enhance adaptability, minimize resistance, and ensure successful digital transformation at scale.

5.3. Theoretical Contributions

This study makes several key contributions to the literature on organizational change management, particularly by extending theoretical frameworks to the underexplored context of aviation ground operations. Existing change models—such as Lewin's Change Management Model, Transformational Leadership Theory, and the Technology Acceptance Model (TAM)—have been predominantly applied in corporate or administrative settings. By contrast, this study integrates these frameworks into the operational realities of ground staff, where change is highly procedural, physically intensive, and technologically mediated. The results demonstrate that training effectiveness, communication satisfaction, transformational leadership, and technology readiness are robust predictors of employee readiness for change (ERC) even in high-pressure, operational environments like airport ground services. The confirmation of these theoretical relationships in the aviation domain affirms the generalizability of existing models while highlighting unique dynamics—such as the moderating effect of technology readiness—that are particularly relevant in tech-driven service environments. Additionally, this study introduces a multidimensional view of readiness for change, grounded in both individual psychological predispositions and organizational support mechanisms, contributing to a more integrated understanding of change outcomes in safety-critical industries.

5.4. Limitations

Despite its strengths, this study is subject to several limitations that should be acknowledged. First, the use of self-reported survey data introduces the risk of common method bias and social desirability bias, as respondents may have answered in ways that align with perceived organizational expectations. Future research could address this by including objective performance data or supervisor assessments. Second, the study is context-specific, focusing exclusively on ground operations personnel in a particular aviation setting. While this enhances depth and relevance to that subgroup, it limits the generalizability of findings to other segments of the aviation industry such as flight crews, air traffic control, or administrative personnel. Third, the cross-sectional research design restricts the ability to draw causal inferences or observe change readiness over time. Although structural equation modeling offers strong statistical evidence of associations, it cannot confirm temporal ordering or dynamic changes in employee perceptions as organizational transformation progresses.

5.5. Recommendations for Future Research

Building upon the findings of this study, several avenues for future research are recommended to deepen the understanding of employee readiness for organizational change within the aviation sector. One key direction is the adoption of longitudinal research designs. While this study employed a cross-sectional approach, future studies could track changes in employee attitudes and readiness over time, particularly across the various phases of change implementation. Such longitudinal data would offer richer insights into how readiness evolves and what factors sustain or hinder change engagement in the long run. Another important extension would involve conducting comparative studies across different airport environments or organizational settings. By examining multiple airports—ranging from regional hubs to large international gateways—researchers could explore how contextual variables such as organizational culture, leadership style, resource availability, or regulatory constraints influence the effectiveness of change management strategies. Comparative studies would also enable cross-case generalization and help identify best practices that are adaptable across different operational contexts. Additionally, future research should consider expanding the target population beyond ground operations personnel to include passenger-facing staff, such as gate agents, check-in staff, and customer service representatives. These employees often serve as the public face of aviation operations and are equally impacted by technological and procedural changes. Including their perspectives would provide a more holistic view of readiness for change across the entire value chain of airport service delivery. Together, these future research directions would contribute to a more comprehensive and nuanced understanding of change readiness in aviation, advancing both theoretical development and practical application in a rapidly evolving industry.

6. Conclusion

This study examined the multidimensional factors influencing employee readiness for organizational change (ERC) within the critical context of aviation ground operations. By drawing on an integrated theoretical framework that includes Lewin's Change Management Model, Transformational Leadership Theory, and the Technology Acceptance Model (TAM), the research applied Structural Equation Modeling (SEM) to analyze survey data collected from 344 ground operations personnel occupying various roles across airport ramp services, logistics coordination, technical support, and maintenance units. The findings revealed that training effectiveness is the most powerful predictor of readiness, followed by communication satisfaction and transformational leadership, while technology readiness emerged as a significant moderator rather than a dominant direct influence. These results emphasize that effective change in aviation depends not only on introducing new technologies or updating procedures, but more fundamentally on aligning structural resources, employee perceptions, and leadership practices in a cohesive and intentional manner.

The results offer meaningful contributions to the academic understanding of change management in high-reliability and high-regulation sectors. The study validates existing theoretical constructs while extending them into a highly specific and operationally intense setting. The identification of communication satisfaction as a mediator and technology readiness as a moderator suggests that ERC is not simply the result of top-down strategy or training volume, but a nuanced psychological state influenced by relational, contextual, and individual factors. The study moves beyond traditional linear models by highlighting the interactive nature of ERC, suggesting it evolves dynamically as a function of trust in leadership, clarity of communication, perceived value of training, and self-efficacy in using new technologies. In doing so, the research contributes a refined framework for understanding readiness in aviation, where change processes must meet both regulatory compliance and the realities of operational complexity.

The findings carry several practical implications for aviation organizations undergoing digital transformation. Training departments must move beyond generic instructional programs and instead deliver simulation-based, role-specific learning experiences that build not only technical competence but also change-related confidence. HR managers should incorporate assessments of employee digital literacy and confidence early in the change process to tailor support interventions accordingly, whether through peer mentoring, adaptive e-learning modules, or foundational upskilling workshops. Supervisors and mid-level leaders play a pivotal role in this process and should be supported with transformational leadership development programs that emphasize empathy, motivational communication, and vision alignment—attributes that help bridge strategic intent with frontline engagement. Communication should be treated as a continuous, two-way function, incorporating visual dashboards, participatory briefings, real-time updates, and feedback loops that foster transparency and emotional inclusion. This is especially critical in environments where

rapid turnaround, procedural compliance, and safety vigilance leave little room for confusion or disengagement during change implementation.

In addition to organizational implications, the results offer insights for policy and regulatory bodies in aviation. National and international aviation authorities, including ICAO, IATA, and civil aviation boards, could incorporate change readiness planning into certification and compliance frameworks, especially for digital or AI-based innovations. Mandating that airlines and ground handling companies submit employee engagement plans alongside technology integration reports would institutionalize the human dimension of digital transformation. Incentives could also be provided to organizations that invest in workforce readiness, such as phased rollout allowances or regulatory relief during training transitions. Long-term aviation policy should recognize that digital infrastructure investments must be matched by equivalent commitments to human capital development to prevent capability gaps at the operational level. Inclusion of digital competency pathways and cross-functional training in national aviation workforce strategies can serve to institutionalize resilience and adaptability across the sector.

Ultimately, this study underscores that readiness for change is not a fixed trait but a fluid and strategic condition shaped by interdependent organizational factors. As the aviation industry advances toward predictive maintenance, AI scheduling, real-time data integration, and sustainability-driven innovation, its success will hinge not only on what technologies are adopted, but on how well its people are prepared to adopt them. Ground operations personnel—often the linchpin between abstract strategy and real-world execution—must be equipped not only with knowledge and tools, but with psychological readiness, confidence, and trust in leadership. Managing the human dimension of transformation is not optional in aviation; it is central to operational safety, efficiency, and long-term competitiveness in a rapidly evolving global transport environment. This study provides a blueprint for aligning leadership, training, communication, and technology readiness to ensure that organizational change is not merely implemented, but truly absorbed and sustained.

Ethics Committee Approval

The field study of this article was approved with the permission of the Ethics Committee, based on the decision taken at the meeting of the İstanbul Ticaret University Scientific Research and Publication Ethics Committee dated 06.05.2025 and numbered E-65836846.044.351886.

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