International Review of Management and Marketing

ISSN: 2146-4405

available at http: www.econjournals.com

International Review of Management and Marketing, 2027, 17(1), 612-620.

From Cabin Service to Adaptive Care: Human-Digital Frontline Capability as a New Paradigm of Sustainable and Resilient Airline Service Quality

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Received: 26 June 2026 **Accepted:** 25 September 2026 **DOI:** https://doi.org/10.32479/irmm.24906

ABSTRACT

This article develops a frontline-centered theory of sustainable and resilient airline service quality. It addresses a persistent blind spot in airline service research: operational systems, digital platforms, sustainability programs, and passenger-facing encounters are often studied as separate domains, even though frontline employees must translate them into one coherent passenger experience. The study uses qualitative documentary research through a critical integrative review and theory-building synthesis. Peer-reviewed work published primarily during 2021-2025 on airline service quality, cabin-crew service, digitalization, self-service, recovery, organizational resilience, sustainable aviation, and passenger behavior was interpreted alongside official IATA and ICAO context. The corpus was theoretically sampled rather than treated as an exhaustive systematic review. Documentary coding focused on the conversion process between backstage capability and passenger-experienced value: Sensing, interpretation, coordination, explanation, escalation, recovery, and learning. The synthesis proposes Frontline-Enabled Sustainable–Resilient Airline Service Quality (F-SRASQ), organized around six mutually reinforcing capabilities: Anticipatory care; human–digital orchestration; inclusive dignity; sustainable service delivery; recovery justice; and crew adaptive capacity, with organizational learning as a cross-cutting feedback mechanism. The article introduces the "frontline conversion layer" as a meso-level bridge between airline operations and passenger evaluations and specifies boundary conditions, failure signals, and measurable indicators that distinguish resilient service from simple recovery speed and sustainable quality from symbolic environmental communication.

Keywords: Sustainable Service Quality, Sustainable Airline Service Quality, Resilient Airlines, Frontline Service Capability, Adaptive Care, Sustainable Aviation
JEL Classifications: L93, M31, M14, O33

1. INTRODUCTION

Airline service quality has traditionally been evaluated after the service encounter: Was the flight reliable? Was the cabin comfortable? Were employees responsive? Did the passenger perceive value and intend to fly again? These questions remain empirically important, and recent meta-analytic and text-mining research continues to connect service attributes with satisfaction, loyalty, and repurchase behavior (Eshaghi et al., 2024; Xie et al., 2024; Bakır et al., 2024). Yet contemporary airline service is increasingly produced by a distributed system rather than by a single encounter. A passenger may receive operational information from an application, biometric identity infrastructure at an airport, automated rebooking, a gate team, partner organizations, and cabin crew during the same journey. The service can therefore be technically efficient at one touchpoint while incoherent at the level of the journey.

This fragmentation matters especially during disruption. An operational recovery model may successfully restore an aircraft rotation while passengers still lack feasible onward journeys; a digital notification may arrive quickly but contradict information available to frontline employees; a sustainability commitment may be prominent in corporate reporting but disappear when disruption

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creates pressure to recover rapidly; and a standardized remedy may exist while remaining unusable for a traveler with a disability, language constraints, or a complex connection. In each case, the quality failure is not reducible to employee friendliness. It concerns the organization's capacity to convert distributed capabilities into a coherent and legitimate experience.

The frontline is therefore theoretically important. Cabin crew and other passenger-facing personnel operate at the boundary between highly regulated operational systems and heterogeneous human needs. They interpret incomplete information, preserve safety, communicate uncertainty, enforce constraints, identify vulnerability, coordinate with digital and ground channels, and sometimes repair failures whose origin lies elsewhere. Recent evidence on cabin-crew service quality confirms that passengers distinguish reliability, professionalism, and authenticity in frontline service (Lee and Kim, 2024). However, treating these as isolated attributes does not explain how frontline work interacts with sustainability, digital transformation, resilience, and recovery justice.

The gap addressed here is a conversion problem. Airline operations research explains how resources can be recovered; digital-service research explains adoption and efficiency; sustainable aviation research examines environmental and strategic constraints; passenger research explains evaluations and loyalty. These streams have advanced rapidly—covering airline competition, digital transformation, sustainability strategy, network resilience, and passenger evaluation—yet they rarely specify the meso-level mechanism through which system capability becomes usable passenger value (Browder et al., 2023; Li and Wang, 2024; Wandelt et al., 2024; Sun et al., 2024; Raihan, 2025). The present study therefore asks: RQ1: Which frontline capabilities translate backstage airline systems into passenger-experienced sustainable service quality? RQ2: How does human–digital coordination alter the meaning of airline service quality during disruption? RQ3: Which dimensions and failure signals define a frontline-enabled paradigm of resilient airline service quality? Figure 1 summarizes the proposed frontline conversion layer, showing how backstage capability is translated through frontline sensemaking, human–digital orchestration, and adaptive care into passenger-experienced quality.

2. REFRAMING AIRLINE SERVICE QUALITY AROUND THE FRONTLINE CONVERSION LAYER

2.1. From Encounter Quality to Conversion Quality

Established service-quality theory and later airline-specific scales foreground reliability, responsiveness, assurance, empathy, tangible evidence, value, and satisfaction. Contemporary airline studies broaden the observable domain to schedule performance, digital interaction, comfort, food, experience, and recovery, and they continue to link these attributes to loyalty and behavioral intention (Chanpariyavatevong et al., 2021; Chung and Tan, 2022; Dike et al., 2023; Fu, 2023; Lippitt et al., 2023; Mahapatra and Bellamkonda, 2023; Kılıç and Enginkaya, 2024; Usun et al., 2024). The conceptual limitation is not that these measures are wrong. It is that they evaluate what passengers observe without fully specifying the organizational translation process that makes those observations possible.

Conversion quality concerns whether operational capability survives translation across organizational boundaries. A reliable re-accommodation option is useless if the frontline cannot see it; accurate operational data create little passenger value if the explanation is unintelligible; a self-service channel increases efficiency only when exceptions can be escalated; and sustainability claims create little legitimate value when frontline practices contradict them. The frontline conversion layer therefore links capability availability to capability usability.

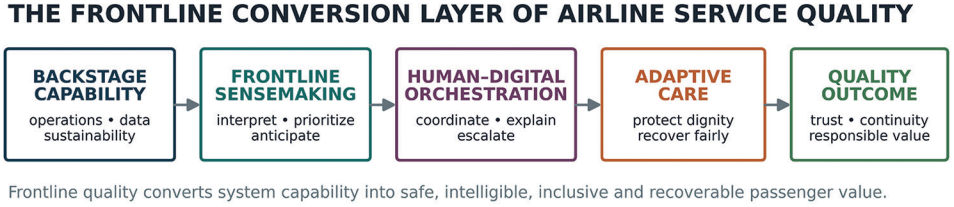
This distinction also clarifies the theoretical level of F-SRASQ. Service-dominant logic treats value as realized in use rather than embedded unilaterally in an offering (Vargo and Lusch, 2016). F-SRASQ narrows that broad premise to a specific airline conversion mechanism: The frontline must make distributed operational, digital, recovery, and sustainability resources intelligible and actionable for a passenger. The construct is therefore neither another satisfaction scale nor a claim that employees control the whole journey; it is a capability architecture whose value should disappear empirically when system resources cannot be accessed, coordinated, or legitimately adapted.

2.2. Why a Flight Attendant Perspective Is Theoretically Useful—but Not a Data Source

The occupational position of a cabin-service professional provides a strong substantive rationale for studying this boundary, but professional experience should not be silently converted into research evidence. This article therefore does not use personal experience, employer records, passenger anecdotes, or observations from any named airline as data. The analytical claims are grounded in published documentary evidence. This separation strengthens transferability across carriers and avoids presenting one organization's routines as universal airline practice.

Cabin service nonetheless offers an analytically revealing setting because the frontline simultaneously carries safety authority and service responsibility. The same employee may need to de-escalate

Figure 1: The frontline conversion layer between airline system capability and passenger-experienced quality



conflict, enforce a safety requirement, protect a vulnerable traveler, explain uncertainty, adapt the service sequence, and maintain interpersonal dignity. A service-quality theory that evaluates courtesy but ignores this constrained discretion understates what airline frontline work actually contributes to resilience.

2.3. Sustainability Changes the Meaning of "Good Service"

Sustainable service quality requires more than attaching environmental performance to a satisfaction scale. Airline sustainability research increasingly links responsibility, planning, resource optimization, CSR, circularity, and passenger evaluation (Al Awadh, 2023; Kim and Hwang, 2023; Praja et al., 2023; Krömer et al., 2024; Sorsa and Bona-Sánchez, 2024; Yang et al., 2024; Raihan, 2025). At the frontline, sustainability becomes credible when resource use, waste, accessibility, employee capacity, and communication are treated as quality constraints rather than optional messages. Sustainable service can therefore require saying no to a resource-intensive or unsafe response even when that response might maximize immediate satisfaction.

2.4. Resilience Changes the Time Horizon of Quality

Resilience shifts evaluation from a completed encounter to a sequence of operating states. Aviation recovery research shows that aircraft, crew, network, and passenger recovery are coupled problems (Sun et al., 2022; Herekoğlu and Kabak, 2023; Su et al., 2023; Sun et al., 2023; Sugishita et al., 2024; Wu et al., 2025). Organizational-resilience research adds anticipation, absorption, adaptation, and learning (Paeffgen et al., 2023), while post-pandemic airline research illustrates why recovery involves structural adaptation rather than a simple return to a previous equilibrium (Garrow and Lurkin, 2021). For service management, this implies that a high-quality airline should not be judged only by how well it performs when the system is stable. It should also be judged by whether essential quality properties survive strain: safety, truthful information, accessibility, viable options, fairness, and accountable escalation.

3. METHODOLOGY

3.1. Research Design: Critical Integrative Review and Theory Development

The study is a qualitative documentary critical integrative review designed for theory development rather than prevalence estimation, meta-analysis, or exhaustive evidence mapping. The analytical unit is a documented mechanism connecting an airline capability, frontline action, operating state, and passenger or stakeholder consequence. The evidence base prioritizes 2021-2025 peer-reviewed research, with older foundational theory retained only when required to define an established construct. Official IATA and ICAO sources are used solely for descriptive passenger and industry context and are not treated as tests of F-SRASQ or proof of its proposed causal relationships.

3.2. Search Logic, Inclusion, and Exclusion

Source discovery was organized around six evidence families: airline service quality and loyalty; cabin-crew/frontline service; digital and self-service technology; service failure and recovery; airline and organizational resilience; and sustainable airline operations/CSR. Eligible sources needed verifiable publication metadata and a direct contribution to at least one of four relationships: system-to-frontline translation, frontline-to-passenger outcome, disruption-to-recovery capability, or sustainability-to-service legitimacy. Studies limited to aircraft engineering without a service consequence, carrier marketing material, unsourced commentary, duplicate versions, and unverifiable publications were excluded from construct generation. Airport studies were retained only when they addressed shared passenger-processing interfaces relevant to airline service. The corpus is theoretically sampled rather than statistically representative.

A methodological boundary is stated explicitly. A complete database-by-database query history and screening count were not preserved during the original construction of the documentary corpus. Accordingly, this article does not retrospectively invent PRISMA counts, claim exhaustive coverage, or label the review as systematic. Instead, bibliographic metadata and DOI/publisher provenance are used as source-integrity checks, and the synthesis is evaluated by theoretical transparency, construct differentiation, rival explanations, and falsifiable propositions. A future systematic extension should preregister databases, exact search strings, screening decisions, and a flow diagram before updating the evidence base.

3.3. Documentary Coding and Integrative Synthesis

Coding proceeded in four passes. First, each source was coded for the service object: encounter, journey, resource, information, employee capability, or sustainability outcome. Second, the operating state was coded as normal operation, strain, disruption, recovery, or post-event learning. Third, mechanisms were coded using action language—sense, interpret, coordinate, explain, escalate, protect, recover, and learn. Fourth, the passenger/stakeholder consequence was identified, including continuity, trust, dignity, accessibility, perceived control, responsible value, safety, and recurrence reduction. Candidate themes were retained only when a mechanism could be connected to both an organizational capability and a passenger-facing consequence.

Rival interpretations were deliberately preserved. Digitalization may be merely a delivery channel rather than a quality dimension; employee wellbeing may be an antecedent rather than passenger quality itself; sustainability may remain a corporate constraint rather than a service attribute. Digital-transformation research therefore informs the orchestration mechanism rather than being treated as evidence that technology is inherently high quality (Halpern et al., 2021; Zhang et al., 2021; Heiets et al., 2022; Browder et al., 2023; Li and Wang, 2024; Simarmata et al., 2025). The final framework retains human–digital orchestration, crew adaptive capacity, and sustainable delivery only where a defensible pathway to passenger-experienced quality can be specified. Table 1 summarizes the review design decisions and safeguards used to preserve the documentary and theory-building boundaries of the study.

4. CONCEPTUAL SYNTHESIS: THE F-SRASQ CAPABILITY ARCHITECTURE

The synthesis yielded six interdependent frontline-enabled capabilities plus organizational learning as a cross-cutting

mechanism. The dimensions are not a checklist of cabin-service behaviors and are not reported as empirical latent factors. They are theory-derived mechanisms specifying how resilient airlines convert distributed resources into passenger value while respecting sustainability and safety constraints.

4.1. Anticipatory Care

Anticipatory care is the capacity to notice a likely passenger need or service failure before it becomes an acute recovery problem. It includes readiness for known vulnerabilities, proactive clarification, early identification of connection risk, and preparation for passengers requiring assistance. Anticipation differs from personalization for commercial convenience: its resilient function is to reduce preventable burden and preserve essential services when slack disappears. This extends empathy from a reactive interpersonal attribute into a capability for early risk sensing, consistent with resilience work that emphasizes anticipation and adaptive capacity rather than recovery alone (Paeffgen et al., 2023; Wandelt et al., 2024).

4.2. Human–Digital Orchestration

Digital tools can scale airline service but cannot eliminate exceptions. Airline and airport digital-transformation research shows strong efficiency potential alongside adoption barriers related to usability, traveler characteristics, perceived control, and access to assistance (Halpern et al., 2021; Heiets et al., 2022; Wongyai et al., 2024; Chaiwan et al., 2025; Simarmata et al., 2025). Human–digital orchestration, therefore, concerns channel agreement, explainability, appropriate automation, and accountable handoff. High quality is achieved when passengers can move smoothly between digital self-service and human assistance without losing context. Failure occurs when automation accelerates a wrong answer or when the employee and the application represent different versions of operational reality. These relationships are synthesized in Figure 2, which positions the six capability domains around the F-SRASQ core and organizational learning as the cross-cutting feedback mechanism.

4.3. Inclusive Dignity

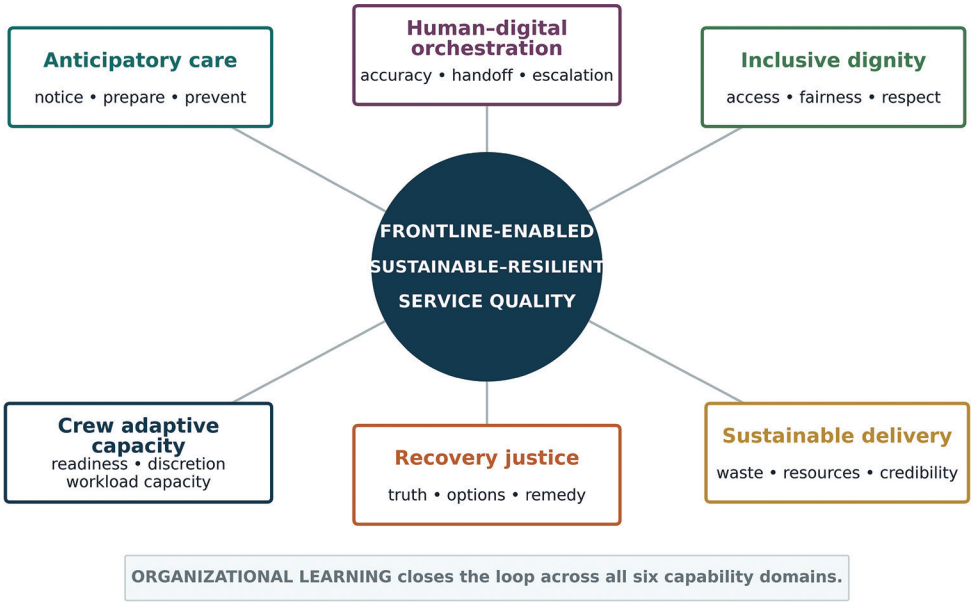
Inclusive dignity evaluates whether a formally available service is actually usable across heterogeneous passenger circumstances. Equality of treatment is insufficient when identical procedures impose radically different burdens. Frontline capability includes recognizing language, mobility, age, family, cognitive, and financial constraints; maintaining respectful communication; and adapting within legitimate boundaries. Passenger-behavior and service research suggests that expectations and evaluations differ across contexts rather than forming one homogeneous market response

Table 1: Review design and safeguards for frontline-centered documentary synthesis

Method element	Design decision	Analytical safeguard
Review purpose	Develop a frontline-centered service-quality construct	No causal or prevalence claims from document counts
Evidence window	Primarily 2021-2025; foundational theory only as needed	Recent evidence prioritized without pretending older theory does not exist
Sampling logic	Theoretical sampling across six evidence families	No claim of systematic/exhaustive coverage
Unit of analysis	Mechanism linking system capability→frontline enactment → outcome	Prevents lists of "good practices" from becoming dimensions automatically
Context statistics	IATA/ICAO descriptive evidence	Separated from construct-generating scholarly evidence
Researcher occupation	Substantive motivation only; not data	No employer, passenger, or autobiographical case evidence
Rival explanations	Channel-only digitalization; antecedent-only crew capacity; external-only sustainability	Retained as boundary tests

The design is an integrative qualitative synthesis, not a PRISMA systematic review or meta-analysis

Figure 2: Frontline-Enabled Sustainable–Resilient Airline Service Quality (F-SRASQ) framework



(Shen and Yahya, 2021; Thongkruer and Wanarat, 2023; Shin et al., 2024). Inclusion is therefore both a sustainability outcome and a resilience capability because disruption can magnify asymmetries that remain less visible during routine operation.

4.4. Sustainable Service Delivery

Sustainable delivery links passenger value to resource discipline and credible responsibility. At the frontline level, sustainability is not reduced to asking crew members to promote environmental messages. It concerns whether service routines, materials, waste practices, recovery choices, and explanations remain compatible with stated environmental and social commitments. Recent airline research connects environmental responsibility with passenger evaluation and sustainability performance, while operations studies demonstrate that resource and sustainability objectives can enter planning decisions (Kiracı et al., 2022; Al Awadh, 2023; Kim and Hwang, 2023; Krömer et al., 2024; Sorsa and Bona-Sánchez, 2024; Yang et al., 2024; Raihan, 2025). The quality test is consistency: a sustainability promise should not vanish precisely when disruption creates cost or capacity pressure. Equally, sustainability must not override safety or essential accessibility.

4.5. Recovery Justice

Recovery justice combines operational feasibility with explanation, procedural fairness, usable options, and proportionate remedy. Airline service-failure research and recent service-recovery work show that recovery evaluations depend on more than the existence of a response; perceived fairness and usable procedures shape post-failure outcomes (Padlee et al., 2021; Song et al., 2024; Lim et al., 2025). Two passengers experiencing the same delay may face different missed connections, caregiving obligations, language barriers, or financial consequences. Frontline-enabled recovery therefore requires truthful uncertainty, clarity about next decision points, and escalation when standardized options cannot restore a viable journey.

4.6. Crew Adaptive Capacity

Crew adaptive capacity is the capability to maintain judgment, coordination, safety discipline, and service dignity under changing demands. It should not be romanticized as individual heroism. Crew- and recovery-oriented research demonstrates that staffing, operational feasibility, coordination, and passenger-facing professionalism are interdependent rather than separate concerns (Herekoğlu and Kabak, 2023; Lee and Kim, 2024; Sugishita et al., 2024; Wu et al., 2025). If quality depends on employees repeatedly compensating for broken systems through discretionary effort, the organization is not resilient; it is consuming human slack. Crew capacity becomes part of service quality only through its effect on passenger safety, information, continuity, and dignity.

4.7. Organizational Learning as the Cross-Cutting Mechanism

Learning closes the conversion loop. A resilient airline should convert frontline observations into improvements in digital rules, recovery playbooks, resource allocation, accessibility, sustainability practice, and partner coordination. Organizational-resilience research treats digital reconfiguration and post-disturbance adaptation as capabilities that must be institutionalized rather than left to isolated individuals (Zhang et al., 2021; Browder et al., 2023; Li and Wang, 2024). Repeat service failures that are handled politely but never prevented therefore represent low adaptive quality. Table 2 consolidates the capability domains, frontline mechanisms, passenger-facing outcomes, and observable failure signals that operationalize the F-SRASQ architecture.

5. A STATE-DEPENDENT NEW PARADIGM OF AIRLINE SERVICE QUALITY

The new paradigm is state-dependent but value-consistent. The operational behavior needed to produce quality changes as the system moves from normal operation to strain, disruption, recovery, and learning. Network and recovery research demonstrates that disruption propagates across connected resources and passenger journeys, making a single return-to-schedule metric insufficient (Su et al., 2023; Sun et al., 2023; Sugishita et al., 2024; Wandelt et al., 2024). Under normal conditions, anticipation and friction reduction dominate. Under strain, prioritization and transparent uncertainty become more important. During disruption, quality is expressed through the protection of essentials, coherent options, and fair escalation. During recovery, explanation and remedy regain prominence. Post-event quality depends on whether the organization learns rather than simply returning to baseline. As shown in Figure 3, the enactment of quality changes across normal operations, strain, disruption, recovery, and learning while core service invariants are preserved.

Table 2: F-SRASQ dimensions, mechanisms, outcomes, and observable failure signals

Capability	Frontline mechanism	Passenger-facing outcome	Failure signal
Anticipatory care	Sense risk and prepare before failure escalates	Reduced avoidable burden; readiness	Need becomes visible only after service breakdown
Human–digital orchestration	Align channels; explain; hand off; escalate	Trustworthy, low-friction action	App and employee disagree; exception has no owner
Inclusive dignity	Adapt within fair and safe boundaries	Usable access; respect; perceived fairness	Nominally equal process excludes vulnerable traveler
Sustainable delivery	Protect resource/social guardrails during service	Credible, responsible value	Sustainability promise disappears under pressure
Recovery justice	Acknowledge, explain, offer viable options/remedy	Control; fairness; journey restoration	Fast response but no usable journey solution
Crew adaptive capacity	Coordinate and exercise bounded discretion	Safety, continuity, dignified service	Quality depends on repeated heroic workarounds
Organizational learning	Capture burden and redesign the system	Lower recurrence and more consistent recovery	The same exception repeats without system change

Figure 3: How frontline-enabled quality changes across operating states while preserving core service invariants



Resilient quality changes how service is enacted under pressure while preserving safety, truth, accessibility and fairness.

This distinction matters because conventional satisfaction measures can reward short-term appeasement. An employee may create momentary satisfaction by promising an outcome that operations cannot deliver. F-SRASQ instead prioritizes service invariants: safety, operational truth, accessibility, feasible choice, respect, and accountability. In severe disruption, a truthful "not yet known," accompanied by a clear next update time, can therefore represent higher service quality than a confident but unreliable promise.

5.1. Passenger Digitalization as a Stress Test of the New Paradigm

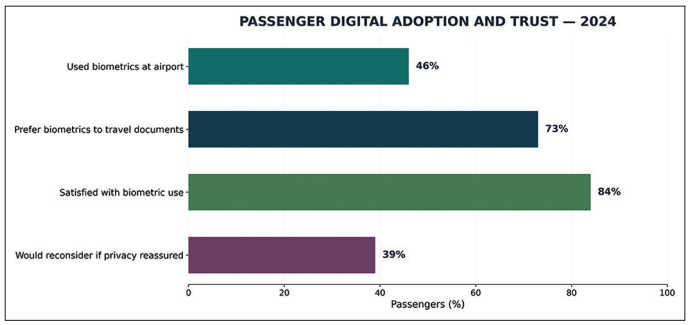
Digital passenger processing provides a useful stress test because convenience and trust coexist rather than substitute for one another. IATA's 2024 Global Passenger Survey reported that 46% of respondents had used biometrics at an airport, 73% wanted to use biometrics instead of passports and boarding passes, and 84% of users were satisfied; at the same time, privacy reassurance could materially affect willingness to use the technology (IATA, 2024a). These figures do not test F-SRASQ, but they demonstrate why digital service quality cannot be reduced to adoption or speed. Figure 4 summarizes these four biometric adoption and trust indicators.

The same survey shows that concern is not abstract. Data breaches, data sharing, unclear use, retention, and deletion rights remain salient. A human–digital resilience perspective therefore asks whether the organization can explain what a system is doing, preserve meaningful consent where applicable, and provide an accountable exception route. Digital convenience without these features can improve flow while weakening trust. Figure 5 presents the corresponding biometric privacy concerns reported in the same IATA survey.

IATA Global Passenger Survey 2024 Highlights, biometric privacy concern items.

Passenger choice data further show why prior experience matters strategically. In IATA's 2024 customer-understanding material, past airline experience was selected by 44% of passengers aged 25 or younger compared with 33% overall when price was excluded, exceeding the younger group's selection of several itinerary-convenience factors (IATA, 2024b). IATA's 2025 passenger survey also documents continuing interest in mobile and digital-identity travel processes (IATA, 2025). These industry surveys should not be generalized to every market, but they reinforce the managerial importance of designing human escalation together with digital convenience. Figure 6 compares flight-choice factors for all passengers and those aged 25 or younger (excluding price), highlighting the salience of prior airline experience among younger travelers.

Figure 4: Passenger biometric adoption, preference, satisfaction, and privacy reassurance, 2024



Source: International Air Transport Association (IATA), Global Passenger Survey 2024 Highlights; N = 13,487. Percentages describe different survey items and should not be summed

Figure 5: Passenger concerns about biometric data use in air travel, 2024

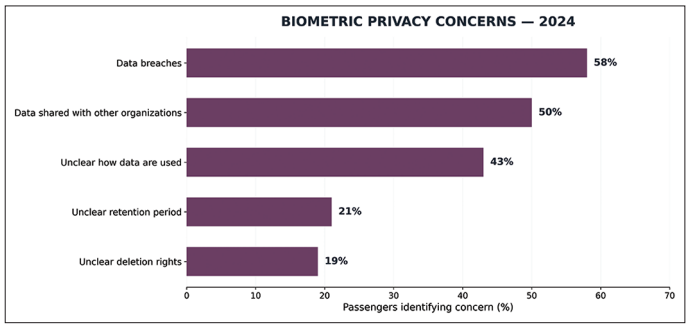
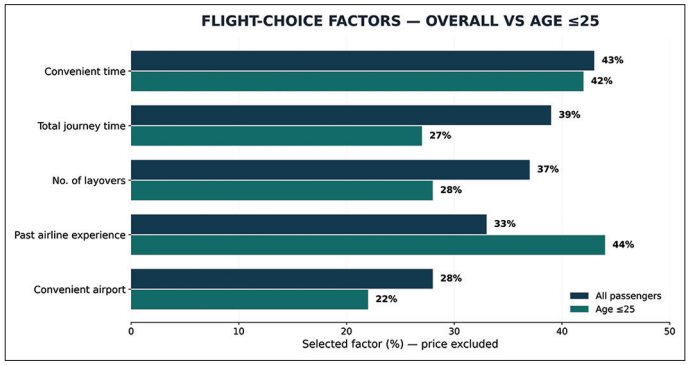


Figure 6: Flight-choice factors for all passengers versus passengers aged 25 or younger, excluding price



Source: IATA, Understanding Our Customers (2024), Global Passenger Survey 2024

The broader operating context is similarly important but is kept analytically separate from construct evidence. ICAO's annual air-transport reporting documents the sector's recovery trajectory across 2022-2024 (International Civil Aviation Organization [ICAO], 2022,

2023, 2024). In this article, those reports establish scale and context only; they are not observations of F-SRASQ and are not used to infer that traffic growth improves or worsens service quality.

5.2. Measurement Architecture and Testable Propositions

A Q1-level conceptual model must be falsifiable. F-SRASQ therefore should not be validated by simply creating favorable questionnaire items for each dimension. Future studies should test whether the construct adds explanatory power beyond established service quality, perceived value, satisfaction, and conventional recovery measures; whether the dimensions remain distinct; and whether the measurement structure is invariant across normal and disrupted journeys. Table 3 translates the conceptual architecture into a proposed measurement framework for future empirical validation, including process indicators, passenger/stakeholder indicators, and discriminant tests.

- Proposition 1: Human–digital orchestration will predict passenger information trust and perceived control beyond digital usability alone, particularly under disrupted operating states.
- Proposition 2: Recovery justice will mediate the relationship between disruption severity and post-journey trust more strongly than recovery speed when standardized recovery options are infeasible for the passenger's journey.
- Proposition 3: Crew adaptive capacity will strengthen the relationship between available operational recovery resources and passenger-experienced continuity; however, this benefit will weaken when workload requires persistent compensatory workarounds.
- Proposition 4: Sustainable delivery will contribute to responsible-value evaluations only when sustainability claims are congruent with observable service practices and do not conflict with safety or accessibility.
- Proposition 5: Anticipatory care and organizational learning will jointly predict lower recurrence of preventable passenger burden across repeated disruption episodes.

6. DISCUSSION

6.1. Theoretical Contribution: Frontline Work as a Meso-Level Conversion Layer

The central contribution is to reposition the frontline from an attribute provider to a conversion layer. Passenger-evaluation studies explain what travelers value (Eshaghi et al., 2024; Xie et al., 2024), operations studies model constrained resources (Sun et al., 2022; Wu et al., 2025), and service-dominant logic explains value realization at a higher level of abstraction (Vargo and Lusch, 2016). F-SRASQ connects these levels by specifying a meso-level mechanism through which operational, digital, sustainability, and recovery resources become passenger-experienced value. This is conceptually different from claiming that cabin crew alone "create" service quality: frontline quality depends on what the wider system makes knowable, feasible, and escalatable.

6.2. The Human–Digital Complementarity Thesis

The framework rejects both digital romanticism and human romanticism. Digital transformation can strengthen sensing, coordination, and customer self-service, but empirical and review evidence also identifies adoption, access, and integration conditions (Halpern et al., 2021; Heiets et al., 2022; Wongyai et al., 2024; Chaiwan et al., 2025). The quality frontier therefore lies in complementarity: routine tasks should not consume scarce frontline attention, while exceptional cases should not be trapped inside automation. This suggests a new design metric—handoff integrity—capturing whether passenger context, prior actions, operational truth, and accountability survive the transition between channels.

6.3. Sustainability as a Service Constraint, Not a Marketing Layer

Sustainable service quality is strongest when environmental and social responsibility constrain how value is created rather than merely decorating the brand. Recent airline studies span passenger-facing sustainability evaluation, CSR, planning, and resource optimization (Al Awadh, 2023; Praja et al., 2023; Krömer et al., 2024; Sorsa and Bona-Sánchez, 2024; Yang et al., 2024; Raihan, 2025). F-SRASQ sets a boundary around that broad literature: sustainability becomes part of service quality only when a defensible pathway to responsible service value, accessibility, workforce capacity, or stakeholder legitimacy can be specified.

6.4. Resilient Airlines Require Resilient Frontlines—but Not Heroic Frontlines

A dangerous interpretation of resilience is that good employees absorb any failure. That logic hides organizational weakness.

Table 3: Proposed measurement architecture for empirical validation

Dimension	Operational/process indicator	Passenger/stakeholder indicator	Discriminant test
Anticipatory care	Preventable exception rate; proactive-assistance completion	Preparedness; reduced avoidable effort	Adds value beyond responsiveness/ empathy
Human–digital orchestration	Cross-channel agreement; escalation completion; handoff loss	Information trust; effort; perceived control	Distinct from interface usability
Inclusive dignity	Accessible completion; assistance latency; exception usability	Dignity; fairness; access	Distinct from generic empathy
Sustainable delivery	Waste/resource indicators linked to service process	Credibility of responsible-value claims	Distinct from CSR reputation
Recovery justice	Viable re-accommodation; explanation/remedy timing	Procedural fairness; recovery control	Distinct from recovery speed
Crew adaptive capacity	Decision support; workload recovery; coordination reliability	Safety confidence; service continuity	Distinct from employee satisfaction
Learning	Repeat-exception rate; action closure; rule redesign	Reduced recurrence burden	Predicts improvement across repeated events

Resilience literature instead emphasizes reconfiguration, adaptation, and learning at organizational and network levels (Browder et al., 2023; Paeffgen et al., 2023; Li and Wang, 2024; Wandelt et al., 2024). Resilient airlines should therefore provide accurate information, decision rights, recovery options, staffing capacity, training, and escalation infrastructure so that frontline discretion can be effective without becoming chronic compensation for system defects. Persistent overextension is a failure signal, not evidence of a resilient culture.

6.5. Managerial Implications

Managers should redesign service governance around conversion failures. First, audit situations in which the passenger and the frontline employee see different operational truths. Second, measure digital-to-human handoff integrity rather than digital adoption alone. Third, include passenger usability and equity in disruption recovery objectives. Fourth, treat recurring frontline workarounds as data about system design. Fifth, connect sustainability metrics to actual service processes and avoid requiring employees to communicate claims that operational practice cannot substantiate. Finally, protect crew recovery capacity as an input to safe and dignified passenger service.

7. CONCLUSION, LIMITATIONS AND FUTURE RESEARCH

A new paradigm of airline service quality should explain more than whether a passenger liked a completed flight. It should explain whether an airline can convert complex operational, digital, human, and sustainability capabilities into safe, intelligible, inclusive, and recoverable value across changing conditions. F-SRASQ advances that argument by placing the frontline conversion layer at the center of analysis while refusing to reduce quality to employee courtesy.

The resulting perspective is demanding but testable. Sustainable service quality requires responsible value creation that remains credible under pressure. Resilient airline service quality requires essential service invariants to survive disruption. Human–digital quality requires accurate coordination and accountable handoff. Frontline quality requires adaptive professional judgment supported by—not substituted for—the wider service system. The resilient airline of the future is therefore not the airline whose employees are best at improvising around failure; it is the airline whose systems allow frontline professionals to convert capability into trustworthy passenger care without sacrificing safety, dignity, sustainability, or their own adaptive capacity.

This study is conceptual and documentary. It does not use primary observations from cabin crew, passengers, or any airline and does not estimate causal effects. That boundary is intentional: the author's occupational familiarity with cabin service is a motivation for the research question, not an evidentiary shortcut. The review is purposive rather than exhaustive and does not claim PRISMA systematic-review status. This is the manuscript's principal methodological limitation: without a preserved database-by-database search and screening log, review completeness cannot be independently reproduced. Official IATA/ICAO statistics provide descriptive context only. The appropriate next step is therefore either empirical testing of the conceptual model or a separately preregistered systematic review with exact queries and screening records; the present article should not blur those designs.

Empirical validation should proceed in stages. Expert content validation can first test whether proposed indicators truly reflect the six capabilities. Passenger studies should then compare routine and disrupted journeys, test discriminant and incremental validity, and assess measurement invariance across markets, travel purposes, and accessibility needs. Multi-source designs could combine operational records, digital-channel logs, recovery outcomes, frontline surveys, and passenger assessments without identifying any single carrier publicly. Longitudinal designs are especially important for testing organizational learning because a one-flight survey cannot establish whether recurrent failures actually decline.

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