Strategic Procurement under Supply Constraints: An Integrated Sourcing Framework for Last-Mile Airline Catering

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This thesis is submitted in partial fulfilment of the requirements for the degree of MSc in Management

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I declare that:

- the thesis submitted has been written by me alone.
- the thesis submitted has not been previously submitted to this university or any other.
- that all content, including primary and/or secondary data, is true to the best of my knowledge.
- that all quotations and references have been duly acknowledged according to the requirements of academic research.

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Abstract

Airline catering procurement operates within a constrained environment marked by supplier scarcity, operational interdependence, and strict regulatory oversight. These conditions amplify cost pressures and increase vulnerability to service disruptions. While previous studies have examined procurement governance, sourcing models, and digitalisation individually, limited research has integrated these dimensions within the context of supply-constrained service industries.

The purpose of this study is to develop an Integrated Sourcing Framework that aligns governance structures, sourcing configurations, and digital enablement to enhance resilience and efficiency in airline catering procurement. Using an inductive qualitative approach, insights were gathered through semi-structured interviews with procurement professionals representing strategic, managerial, and operational functions. Findings reveal the importance of adaptive governance portfolios that adjust to market maturity: relational governance ensures continuity in monopoly contexts, hybrid structures balance flexibility and control in semi-competitive environments, and modular sourcing promotes efficiency in competitive markets.

Digital capability emerged as the backbone of procurement integration, enabling transparency, collaboration, and proactive coordination. These findings informed the development of the Integrated Sourcing Framework and a three-phase Implementation Roadmap (Stabilise, Integrate, Optimise), which together offer a structured pathway for adaptive sourcing transformation.

The study contributes to procurement governance and service-modularity literature by embedding digitalisation as an enabling mechanism for strategic adaptability. Limitations include its single case focus and the absence of supplier perspectives, which restrict generalisability but provide a foundation for future comparative and longitudinal research.

Keywords:

Procurement governance, Airline catering, Sourcing models, Digital integration, Adaptive sourcing framework, Supplier collaboration

Acknowledgements

“Yet at the hundred-and-first blow it will split in two, and I know it was not the last blow that did it, but all that had gone before.”-Jacob Riis (1849-1914)

This thesis represents the culmination of two years of perseverance and continuous effort a journey that began when I first stepped into a management role and later evolved into a deeper pursuit of understanding through this Master’s programme at Cranfield University. Completing this final part of my degree fills me with immense pride and gratitude.

I would like to express my sincere thanks to TUI Airlines for the invaluable learning experience, guidance, and support provided throughout my internship. It was a privilege to gain insight into the complexity of airline ground operations and to contribute to their ongoing strategic transition. I could not have asked for better colleagues and managers, whose mentorship and collaboration were truly inspiring.

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1 Introduction

1.1 Background

The airline industry operates within a complex and margin-sensitive environment, where profitability relies on efficiently managing extensive and interdependent supply chains (Doganis, 2019). These supply chains are highly vulnerable to disruption, with external shocks such as geopolitical instability, labour shortages, and crises like COVID-19 exposing weaknesses in operational resilience (Sarkis, Cohen, Dewick, & Schröder, 2020). Ensuring robustness, efficiency, and continuity in supply chains has thus become a strategic priority for airlines.

Within this context, airline catering represents a distinctive “last mile” supply chain activity critical to operational continuity, passenger safety, service quality, and on-board revenue generation (Hanlon, 2019; IATA & Airline Catering Association, 2022). As an outsourced service, catering combines high perishability, strict regulation, and extreme time sensitivity, where even minor failures can disrupt flight schedules and passenger satisfaction (Vereecke & Muylle, 2006).

Procurement of last-mile catering services is further challenged by fragmented global catering markets, marked by regional variations in contracting, infrastructure, and regulation (van der Valk & Rozemeijer, 2009). In many airports, airlines operate in monopolistic or highly concentrated supplier markets, with limited qualified caterers reducing competition and increasing dependency (Caniëls & Gelderman, 2007). Suppliers, in turn, prioritise airlines offering volume stability, network consistency, or technological integration, while deprioritising carriers seen as operationally costly (Hald, 2012; Schiele, Calvi, & Gibbert, 2012).

Thus, last-mile catering lies at the intersection of supplier scarcity and operational complexity. High regulatory demands, infrastructural bottlenecks, and supplier concentration require procurement strategies that balance efficiency with resilience. Airlines must adopt adaptive sourcing approaches suited to both competitive and constrained markets (Harland, Knight, Lamming, & Walker, 2005). These challenges highlight the need for an integrated sourcing framework aligning governance, sourcing models, digital coordination, and cost–risk

optimisation to ensure reliable and sustainable catering operations across global networks.

1.2 Introduction to TUI Airline Group

As part of the MSc in Management programme at Cranfield University, the author undertook a four-month internship with TUI Group, working within the airline segment based in Luton. Founded in 1962, TUI has grown into the world's largest integrated leisure, travel, and tourism company, employing over 66,000 people worldwide. The group operates across multiple segments including tour operations, hotels and resorts, cruise, and aviation. Its vertically integrated model allows the company to manage the entire value chain of leisure travel, with airlines playing a central role in connecting customers to destinations (TUI Group, n.d.-a, 2024). TUI's airline division supports the group's growth strategy by strengthening its competitive aviation platform. The company continues to invest in fleet expansion and modernisation to enhance customer experience while improving efficiency through more fuel-efficient aircraft. By doing so, TUI aims to unlock new destinations, optimise operating costs, and reinforce its position as a market leader in leisure aviation (TUI Group, n.d.-a, 2024).

1.3 Management Problem and Justification for Study

Airlines operate in an inherently complex and margin-sensitive industry where supply chains play a vital role in the day-to-day execution of flights (Doganis, 2019). These supply chains are highly vulnerable to disruption and therefore need to be robust, cost-efficient, and reliable (Sarkis, Cohen, Dewick, & Schröder, 2020). Among the most critical elements of the airline supply chain is last-mile catering, which directly impacts flight safety, customer satisfaction, and on-board retail revenues that contribute to profitability (IATA & Airline Catering Association, 2022; Hanlon, 2019). Yet, catering procurement is subject to several challenges. Differences in contracting policies across regions, the presence of monopoly or limited suppliers, supplier selectivity, increasing competition, and infrastructure limitations have all heightened the level of uncertainty in buyer–supplier

relationships (van der Valk & Rozemeijer, 2009; Caniëls & Gelderman, 2007; Hald, 2012).

To manage these hurdles effectively, airlines need strategies that allow them to acknowledge and adapt to the diverse scenarios they encounter. In some cases, airlines may face monopolistic supplier environments; in others, they may struggle with suppliers lacking the capacity or infrastructure to meet requirements (Harland, Knight, Lamming, & Walker, 2005). Procurement strategies must therefore be capable of addressing this dynamic environment, providing flexibility to respond to scarcity, variability, and selective supplier behaviour while ensuring operational continuity and cost control (Ellram, Tate, & Petersen, 2013; Williamson, 2008).

However, existing literature has not provided a unified framework for addressing these interrelated challenges in last-mile airline catering. While previous studies have considered governance models, sourcing approaches, digital integration, and cost–risk trade-offs individually, they do not integrate these perspectives into a comprehensive approach tailored to the specific conditions of constrained catering environments (Bienhaus & Haddud, 2018; Hypko, Tilebein, & Gleich, 2010; Voss & Hsuan, 2009). This study seeks to address this gap by developing a sourcing framework that aligns with the realities of supply scarcity and operational complexity in airline catering.

1.4 Aim

This study aims to develop an integrated sourcing framework for last-mile airline catering that combines governance, sourcing models, digital tools, and cost–risk management into a comprehensive approach tailored to supply-constrained environments.

1.5 Objectives

1. To examine how supplier scarcity, monopoly risks, and supplier selectivity influence governance choices and buyer–supplier relationships in last-mile airline catering.

2. To analyse the operational complexities of catering supply chains, including perishability, regulatory requirements, regional infrastructure limitations, and network fragmentation.
3. To evaluate sourcing models such as relational contracts, modular sourcing, hub-and-spoke distribution, and digital platforms for their applicability in constrained catering environments.
4. To integrate insights from literature and industry evidence into a unified sourcing framework that balances cost efficiency, risk mitigation, and supply resilience across diverse geographic contexts.

2 Literature Review

2.1 Supplier Scarcity and Governance

2.1.1 Buyer-Side Constraints and Governance Approaches

In supply-constrained service environments such as airline catering, procurement strategies are shaped by both limited supplier availability and service complexity. Transaction Cost Economics (TCE), introduced by Williamson (1991), explains that firms facing high asset specificity, uncertainty, and frequent transactions often internalise or form long-term relational contracts to minimise transaction costs (Williamson, 2008; Geyskens, Steenkamp, & Kumar, 2006). This is especially relevant in airline catering, where strict food safety, security clearances, delivery precision, and refrigeration infrastructure are critical.

When supplier options are limited, governance often shifts toward hybrid models such as alliances, joint ventures, or strategic contracts emphasising trust, interdependence, and adaptability (Caniëls & Gelderman, 2007; Heide & John, 1992). Airlines collaborate closely with a few catering partners to maintain continuity and quality, reducing reliance on purely transactional sourcing. These long-term, relationship-based contracts mitigate opportunism and align expectations in uncertain, asset-specific transactions.

Thus, procurement in such contexts focuses less on price competition and more on relational governance and continuity assurance. However, while these mechanisms address buyer-side scarcity, suppliers also influence market scarcity through selective client engagement.

2.1.2 Supplier Selectivity and Client Attractiveness

In constrained environments, scarcity is not unilateral; suppliers also face operational limits and make strategic choices about whom to serve. The concept of supplier selectivity where suppliers evaluate buyer attractiveness has gained prominence in strategic sourcing literature (Ellram, Tate, & Petersen, 2013). Suppliers assess factors such as financial volume, technological compatibility, geographical footprint, and potential for long-term engagement.

Airlines with large fleets, high route frequency, geographical consistency, and process standardisation are more attractive to suppliers due to stable demand, lower per-unit risk, and replicable service requirements (Steinle & Schiele, 2008; Schiele, Calvi, & Gibbert, 2012). These traits reduce coordination costs and enhance production efficiency. Integration of digital ordering, forecasting, and invoicing systems further improves coordination, aligning with suppliers' focus on automation and lean operations (Kähkönen & Lintukangas, 2012; Handfield, Straube, Pfohl, & Wieland, 2013). Together, these factors reflect the value creation mechanisms in supplier relationship theory, where value stems from physical proximity, product alignment, and relational strength (Kähkönen & Lintukangas, 2012).

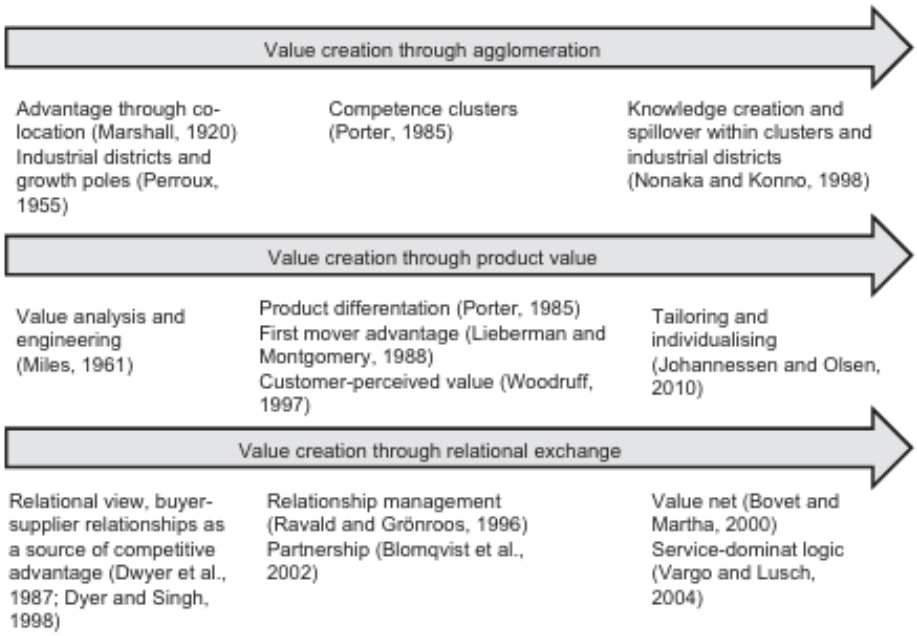

Figure 2-1 Dimensions of value creation in supplier relationships. *Source: (Kähkönen & Lintukangas 2012).*

Conversely, suppliers may avoid partnerships that require overstretching their operational capacity, such as servicing irregular flight schedules, remote airports, or regions without established infrastructure. These situations introduce operational fatigue and increase the risk of non-compliance or service failure (Hald, 2012). This dynamic creates a form of 'reverse selection', where suppliers proactively withdraw from or deprioritise relationships that do not align with their

strategic or logistical capabilities. These behaviours are illustrated in Hald's (2012) study of supplier-customer relationships, which maps how failures in logistics alignment, technology integration, or key account engagement often lead to stalled collaborations or terminated sourcing discussions (see Figure 2.2).

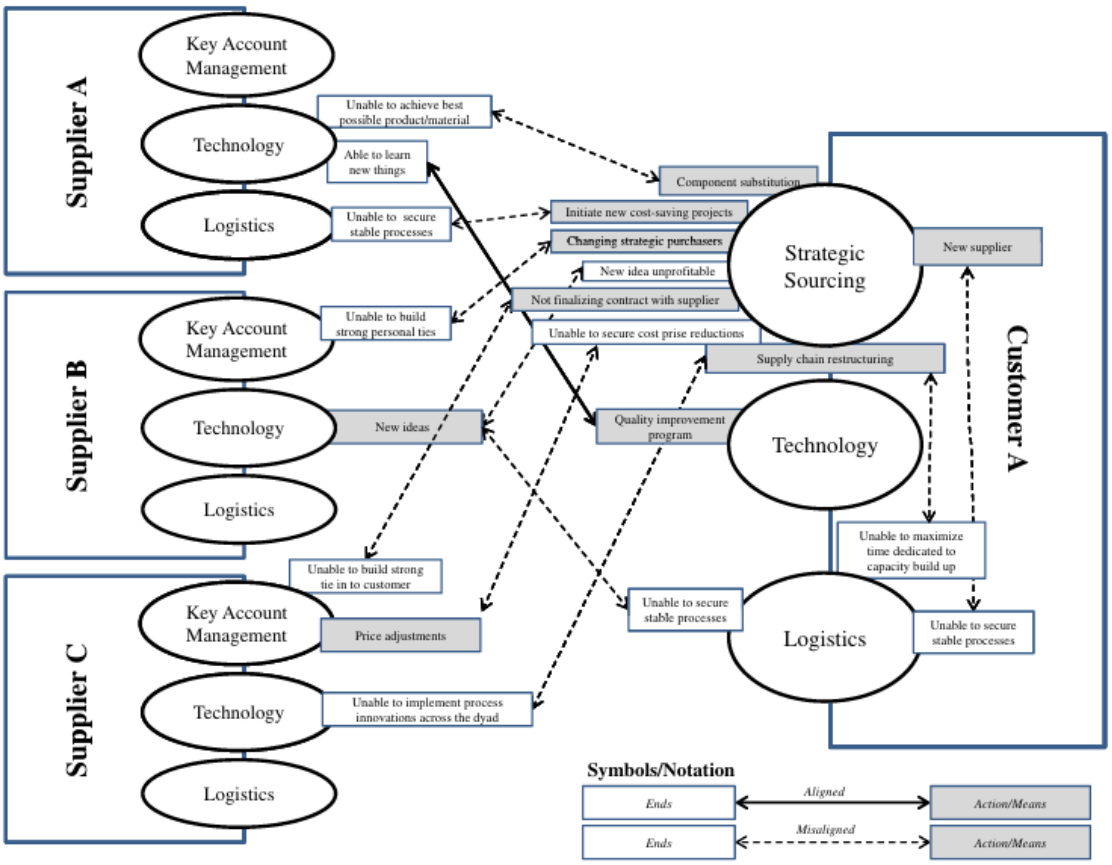

Figure 2-2 Supplier-customer misalignments in sourcing relations. *Source: (Hald 2012).*

The implications of supplier scarcity thus extend beyond mere availability. Airlines must consider how their operational models and sourcing practices influence their perceived attractiveness. This interplay of buyer-side governance and supplier-side selectivity forms a critical foundation for understanding sourcing dynamics in complex service sectors such as airline catering. The following section builds on this by examining the operational complexities that further constrain supplier participation, particularly in last-mile catering environments.

2.2 Complexity in Airline Catering Operations

Airline catering is one of the most operationally complex services in aviation, combining perishability, strict regulation, time sensitivity, and network fragmentation (IATA & Airline Catering Association, 2022). As a last-mile operation, it faces multiple layers of risk and variability, from flight delays and aircraft swaps to route-specific menus and differing airport infrastructure (International Flight Services Association, as cited in Motley Rice LLC, n.d.). These factors demand exceptionally tight coordination between airlines, ground handlers, and caterers.

Service level agreements (SLAs) are highly detailed, specifying timelines, food safety standards, documentation compliance, and contingency protocols. Any disruption such as delays, gate changes, or incorrect loading can cascade into failures, increasing suppliers' burden through rework, waste, or reputational risk (Vereecke & Muylle, 2006). Unlike traditional supply chains, airline catering operates with narrow delivery windows, strict sequence control, and minimal tolerance for deviation, making it a classic high-reliability, low-buffer system.

The in-flight catering process includes sequential, interdependent stages menu planning, procurement, storage, dispatch, and onboard service each with critical control points where operational or food safety failures may occur. As shown in Figure 2.3, these stages involve repeated transitions between preparation, storage, and transport under tight time and regulatory constraints.

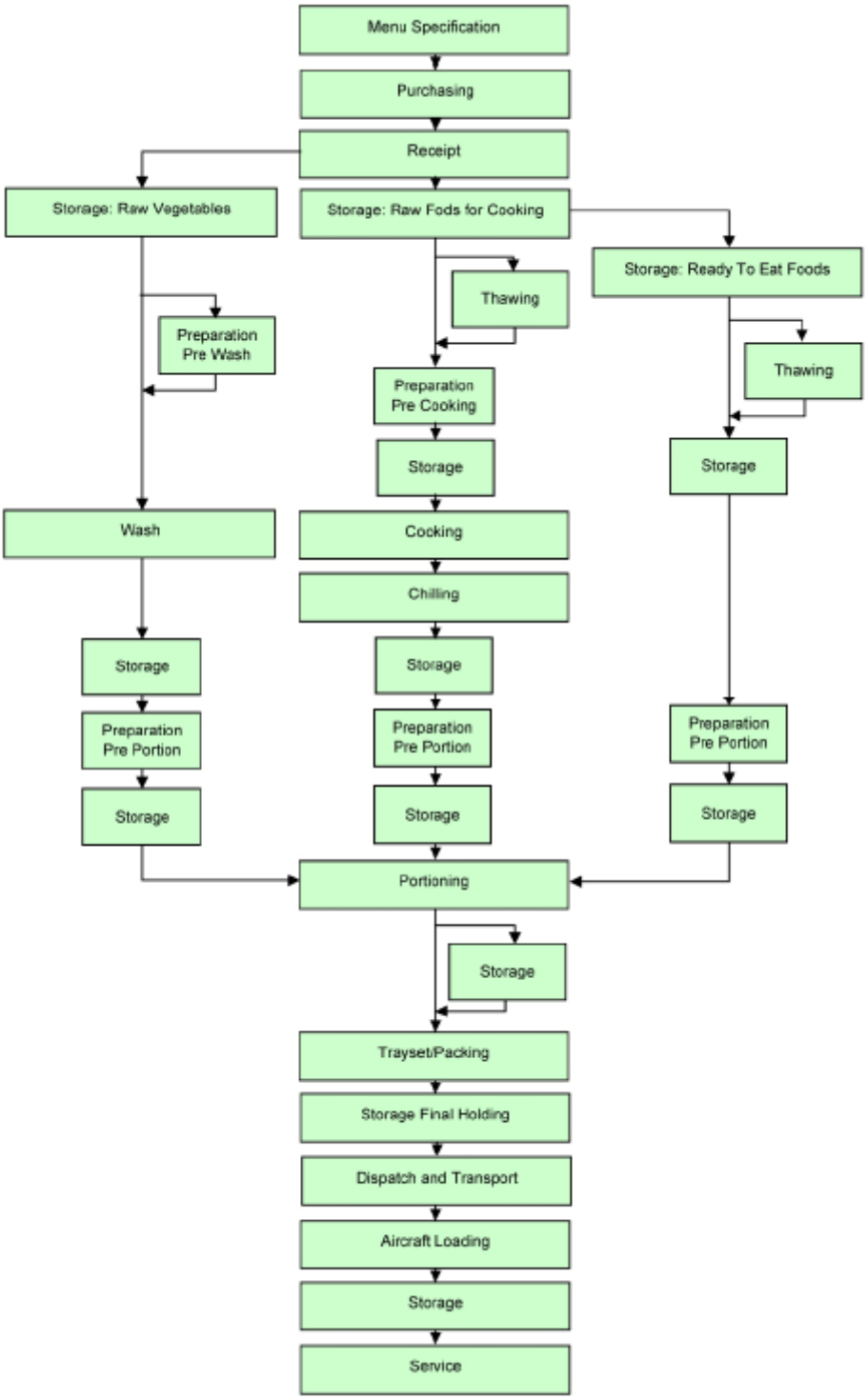

Figure 2-3 Typical process flow for airline catering operations. *Source: (Motley Rice LLC, n.d.).*

The service level agreements (SLAs) governing these relationships are highly detailed, outlining provisioning timelines, food safety standards, documentation

compliance, and contingency protocols. Disruptions such as flight delays, gate changes, or incorrect loading can cascade into operational failures, increasing supplier burden through rework, waste, or reputational risk (Vereecke & Muylle, 2006). Unlike traditional supply chains, airline catering operates with narrow delivery windows, strict sequence control, and minimal tolerance for deviation, making it a high-reliability, low-buffer environment.

Key stages such as storage handovers, dispatch, and aircraft loading are high-risk bottlenecks where delays, temperature breaches, or handling errors can cause major disruptions. Risks intensify in geographically dispersed networks, where limited infrastructure drives subcontracting or higher logistical and compliance costs (Harland et al., 2005). Variation in contracting policies and regulatory requirements across airports affects supplier availability and procurement suitability (Harland et al., 2005; van der Valk & Rozemeijer, 2009). In regions with weak cold chains or restricted airside access, suppliers may seek cost-sharing or co-investment, raising transaction costs and risk (Hald, 2012; Harland et al., 2005). These regional factors reinforce supplier selectivity and market fragmentation noted in Section 2.1, shaping adaptive sourcing for last-mile catering.

Airlines with highly customised catering needs often struggle to secure reliable suppliers. While personalisation enhances passenger experience, it increases coordination complexity and reduces predictability. Conversely, standardised menu cycles, uniform provisioning formats, and integrated ordering platforms streamline operations and improve coordination (Silvestro, 1999; Sampson & Froehle, 2006). Such practices enhance predictability in time-critical, regulated environments. Overall, last-mile catering involves greater operational risk than most outsourced services, requiring strong governance and alignment of suppliers with route networks, technology, and process design.

2.3 Service Sourcing Models

Service-based industries operating under high uncertainty, asset specificity, and capacity constraints have increasingly adopted sourcing approaches that move beyond traditional transactional contracting. These models aim to better align

buyer–supplier incentives, share operational risks, and enhance resilience in complex service delivery environments. Three particularly relevant approaches for last-mile airline catering are contracts and partnerships, modular sourcing, and digitisation.

2.3.1 Contracts and Partnerships

Collaborative contractual models such as Public–Private Partnerships (PPPs) are widely used in public transport, healthcare, and infrastructure. PPPs leverage private-sector expertise and investment while maintaining oversight through shared infrastructure and performance-based governance. They distribute risk, foster innovation through co-investment, and promote long-term service stability (Hodge & Greve, 2016). Though rooted in public-sector projects, these principles apply to private services like airline catering, where joint planning and long-term commitments can strengthen supplier relationships.

Relational contracting offers another governance-oriented approach, emphasising trust, flexibility, and mutual adaptation over the contract lifecycle. Common in facilities management and infrastructure, it supports adaptive responses to disruptions and demand shifts, enabling suppliers to innovate and sustain service quality (Manley & Chen, 2017).

2.3.2 Modular Sourcing

The modular service delivery model structures services into standardised, interchangeable components that can be combined and scaled to meet varying operational requirements (Voss & Hsuan, 2009). This approach balances efficiency and flexibility, enabling rapid adaptation without redesigning the entire system. In complex service environments, modularity reduces process variability, improves supplier coordination, and supports integration with multiple partners. Service modularity can also be advanced through platform-based approaches, where shared infrastructure and standardised modules form the basis for customised service packages (Pekkarinen & Ulkuniemi, 2008). In logistics-intensive services, methods such as Quality Function Deployment (QFD) translate customer requirements into distinct service modules (Lin & Pekkarinen,

2011). In airline catering, this enables standardised menu cycles, packaging formats, and loading procedures, reducing variability and supplier fatigue.

Operational strategies further reinforce modular sourcing. A hub-and-spoke configuration centralises inventory and quality control, with suppliers delivering modular components to a hub for redistribution, improving efficiency and network resilience (Campbell & O'Kelly, 2013; Zhang & Zhang, 2002). Back catering, where additional meals are loaded at a hub to cover return flights, consolidates purchasing with a primary supplier and reduces destination sourcing (Hanlon, 2019; Airline Catering Association, 2020). Both approaches ease supplier strain while enhancing reliability in constrained environments.

However, these models are not universally applicable and must adapt to local conditions. Airlines may vary strategies based on route networks, supplier capacity, and infrastructure. Hub-and-spoke systems suit concentrated networks, while back catering fits regions with limited catering options and longer turnarounds. Likewise, long-term relational contracts suit monopoly suppliers, while transactional or performance-based models better fit competitive markets (Hodge & Greve, 2017; Manley & Chen, 2017). This underscores the contingent, adaptive nature of sourcing in last-mile catering.

2.3.3 Digitisation

Technological advances are reshaping service sourcing models, with digital procurement platforms enabling enhanced forecasting, real-time tracking, and automated compliance monitoring. These tools improve buyer–supplier coordination, reduce transaction costs, and allow for dynamic adjustment of supply plans in response to operational disruptions (Kache & Seuring, 2017). In procurement, digitisation can streamline processes, improve spend visibility, and strengthen supplier collaboration through integrated platforms (Bienhaus & Haddud, 2018). Advanced analytical tools also support supplier selection and integration by optimising multiple performance and sustainability criteria (Ghadimi, Wang, Lim, & Heavey, 2019). For last-mile airline catering, digitisation can facilitate seamless communication between airlines, catering hubs, and

suppliers, supporting both operational scalability and supplier attractiveness in constrained markets.

2.4 Cost–Risk Analysis and Contract Design in Services

Procurement in complex service environments requires balancing cost efficiency with risk mitigation, particularly when delivery is time-sensitive, safety-critical, and asset-specific. The Total Cost of Ownership (TCO) framework evaluates not just purchase price but also operational, quality, and risk-related costs across the contract lifecycle (Ellram, 1995). In airline catering, TCO considerations include supplier proximity, cold-chain integrity, waste management, and disruption recovery capacity factors that directly affect cost and service continuity.

Cost benchmarking across regions is difficult, as identical specifications vary by market conditions, supplier availability, and regulations (van der Valk & Rozemeijer, 2009). Limited competition can result in sole-source arrangements, reducing negotiation leverage (Caniëls & Gelderman, 2007). Global suppliers may lack full regional coverage, requiring a mix of global and local providers with differing cost structures (Knight, Harland, & Telgen, 2007). Without reliable benchmarks, airlines risk inefficiency, necessitating sourcing strategies that are both cost-aware and context-adaptive.

Service procurement adds operational, financial, and reputational risks that are harder to quantify than in goods purchasing (van der Valk & Rozemeijer, 2009). In constrained markets, efficiency security trade-offs intensify, often requiring premiums to ensure supply (Knight et al., 2007). Effective contract design mitigates such risks: performance-based contracts link pay to outcomes (Hypko, Tilebein, & Gleich, 2010), while risk-sharing clauses reduce adversarial behaviour (Zsidisin & Ellram, 2003). Buyer–supplier interdependence encourages collaboration and flexibility (Caniëls & Gelderman, 2007).

Given the perishability and regulation in airline catering, contracts must ensure contingency planning, compliance, and dispute resolution. Robust agreements reduce operational and reputational risk, whereas weak ones increase supplier reluctance on complex routes.

3 Methodology

3.1 Overview

This chapter outlines the methodological design adopted to achieve the study's aim of developing an integrated sourcing framework for last-mile airline catering. It details the research approach, data collection, participant selection, and analytical procedures applied throughout the study. The methodology is structured in accordance with the research design illustrated in Figure 3-1, which follows four interconnected phases: conceptual, empirical, analytic, and dissemination.

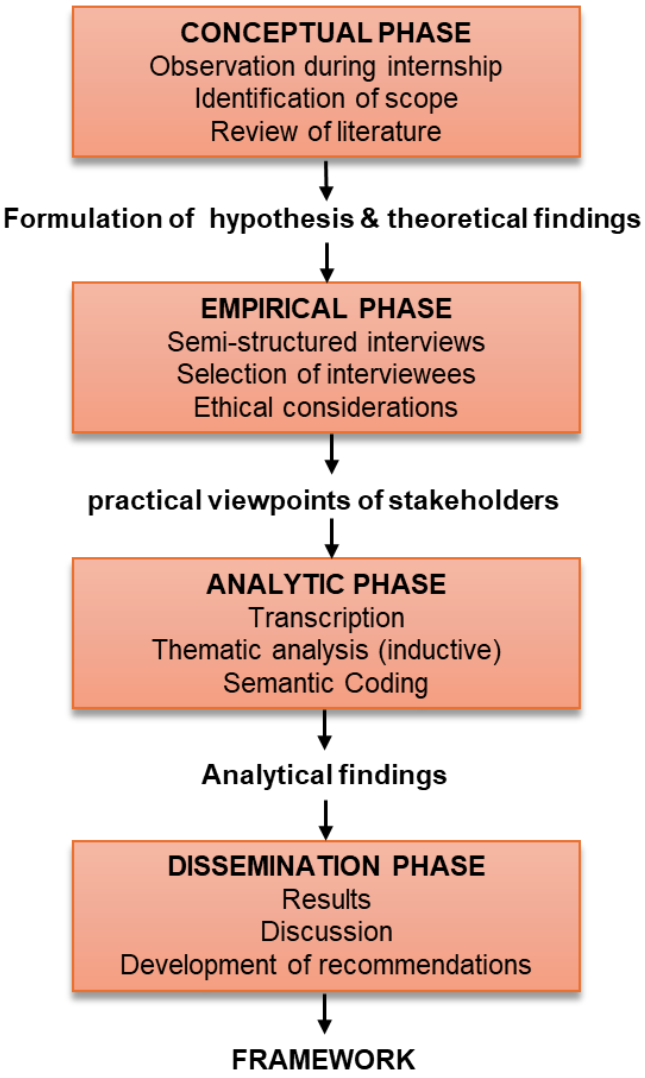

Figure 3-1 Research Design Flowchart. *Source: (Author)*

3.2 Conceptual Phase

The conceptual phase established the theoretical foundation and scope of the study. Drawing on professional experience in airline procurement, initial issues of supplier scarcity, market concentration, and sourcing complexity were identified and examined through a focused literature review. This phase aimed not only to summarise existing knowledge but to assess the adequacy of theory in explaining sourcing within constrained service environments. The review, conducted through databases such as ScienceDirect, Emerald Insight, and ResearchGate, revealed limited prior research addressing adaptive sourcing in airline catering, justifying an inductive qualitative approach. Following Saunders, Lewis, and Thornhill (2019), the absence of established models supported the need to build conceptual understanding from practice-based insights rather than to test predefined hypotheses. The phase concluded with the formulation of the research aim and four objectives, which guided the design and execution of the empirical stages.

3.3 Empirical Phase

3.3.1 Data Collection Method

Semi-structured interviews were used to collect qualitative data, as this method offers both structure and flexibility to explore participants' experiences. The interview guide was informed by themes from the literature review governance, sourcing models, and digitalisation but allowed open exploration for new insights to emerge. This aligns with Creswell and Poth (2018), who emphasise that interpretivist inquiry benefits from participant-led dialogue, enabling contextual understanding rather than measurement.

Interviews were conducted via Microsoft Teams, accommodating participants based across multiple TUI airline divisions and ensuring scheduling flexibility. Each session was recorded with the participants' consent and subsequently transcribed verbatim to preserve the authenticity of their responses.

3.3.2 Participant Selection

A purposive sampling approach was used to ensure that participants had relevant procurement experience and decision-making responsibilities. This aligns with Bryman (2016), who notes that purposive sampling is appropriate when depth of insight and contextual understanding are more valuable than statistical generalisation. Participants were selected to represent different levels strategic, managerial, and operational to provide a balanced perspective across procurement functions.

Table 3-1 Participant profile and interview duration. *Source: (Author)*

Participants	Role	Organisation	Duration
Head			
p6	Head of the Procurement department	TUI	52 minutes 1 second
Managers			
p2	Senior manager	TUI	44 minutes 15 seconds
p3	Procurement manager	TUI	35 minutes 7 seconds
p4	Product Manager	TUI	51 minutes 59 seconds
p5	Forecast Manager	TUI	45 minutes 1 second
Specialists			
p7	Specialist	TUI	48 minutes 35 seconds
p8	Specialist	TUI	50 minutes 23 seconds
p9	Specialist	TUI	49 minutes 44 seconds
p10	Specialist	TUI	43 minutes 28 seconds
p1	Specialist	TUI	45 minutes 47 seconds

The interviews averaged 46 minutes and 54 seconds in duration, allowing sufficient depth to explore complex procurement dynamics while maintaining participant engagement.

3.4 Ethical Considerations

All participants were provided with an information sheet outlining the study's purpose, voluntary nature, and confidentiality assurances. Informed consent was obtained before each interview, and anonymisation codes (P1–P10) were applied in all data references to ensure privacy. The research complied with Cranfield University's ethical standards for student research.

3.5 Analytic Phase

The interview transcripts were analysed using inductive thematic analysis, supported by NVivo software to ensure systematic organisation and traceability of data. The process followed the logic of Gioia, Corley, and Hamilton (2013), beginning with open coding to capture first-order concepts in participants' own terms. These were grouped into second-order themes and ultimately consolidated into aggregate dimensions. The iterative nature of the analysis reflected the inductive aim of building theory from practitioner insight.

The analysis procedure followed the structured steps outlined by Hilal and Alabri (2013, adapted from Bazeley, 2007), as illustrated in *Figure 3-2*. This framework guided the analytical workflow from project creation through to node development, coding, and thematic interpretation.

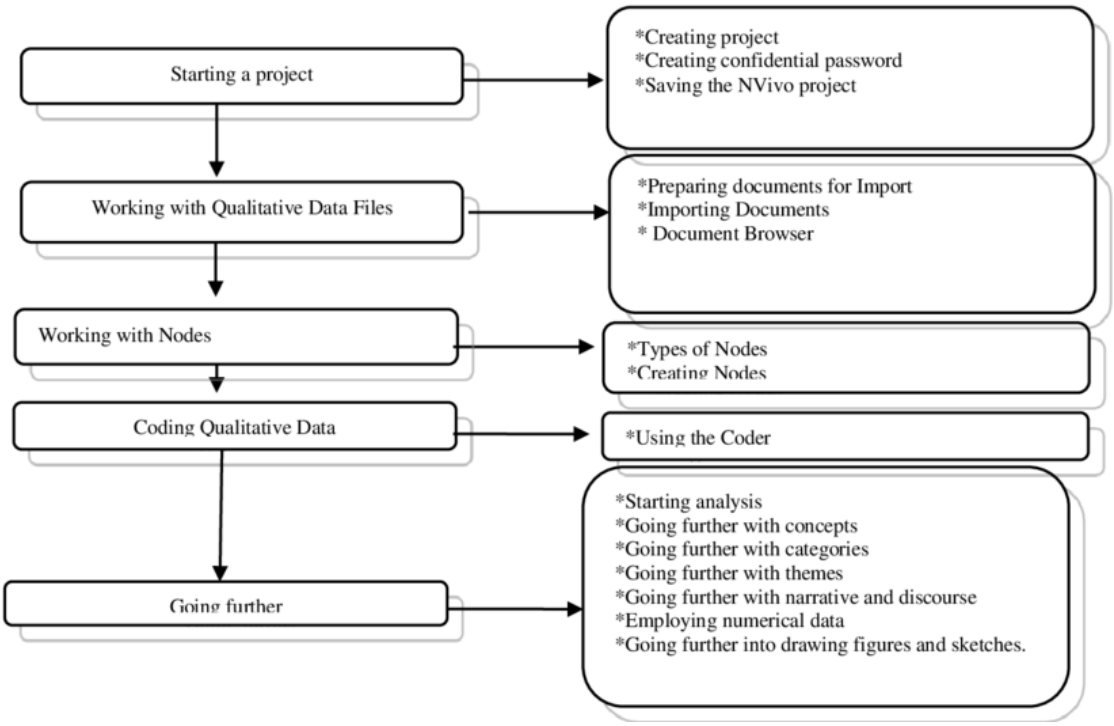

Figure 3-2 Procedure Followed in Applying NVivo. *Source: (Hilal & Alabri, 2013, adapted from Bazeley, 2007).*

3.6 Research Validity and Limitations

To enhance validity, triangulation was achieved through the combination of professional observation, literature evidence, and primary interview data. The use of verbatim transcription and software-assisted coding increased the reliability of theme identification and reduced interpretive bias.

However, the qualitative and case-based nature of the study means that findings are context-specific and not intended for broad statistical generalisation. The study's strength lies instead in its depth of insight, offering transferable learning to similar procurement environments facing supplier scarcity and operational constraints.

4 Results

4.1 Introduction

This chapter presents the key findings from ten semi-structured interviews, thematically analysed in NVivo. The analysis generated four main themes: *Constrained Environments*, *Supplier Attractiveness and Selection Criteria*, *Sourcing Methods*, and *Evolving Trends in Airline Catering Procurement*. These themes collectively capture how airlines manage procurement within supply-constrained markets, evaluate supplier relationships, adapt sourcing strategies, and respond to emerging industry trends.

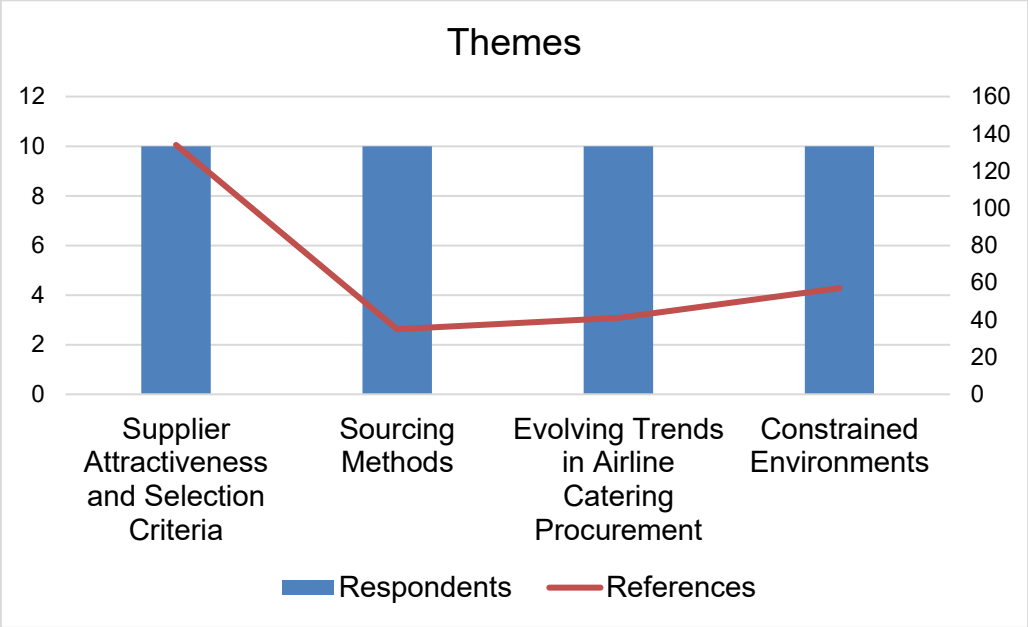

Figure 4-1 Frequency of Respondent and Reference Distribution Across Themes.

Source: (Author).

4.2 Constrained Environments

4.2.1 Supplier Reluctance and Selectivity

Participants described growing supplier caution in catering contracts, reflecting a shift from expansion to profitability. “The pandemic shifted suppliers from aggressive growth to protecting profitability and limiting capacity” (P6). Many now avoid low-return or high-complexity tenders: “Some suppliers decline tenders if adapting to service setups offers little margin” (P4) and “Suppliers decline tenders

in markets where flight frequency is too low to justify costs" (P10). Similarly, "Suppliers sometimes unwilling to engage when route volumes are too low to justify investment" (P8). Operational complexity also drives selectivity, as "Suppliers assess packing plans, varied galleys, and product differences before engaging" (P2), and "reluctant to invest heavily across dispersed gateways" (P4).

Overall, post-pandemic caution, cost sensitivity, and capacity constraints have led to selective supplier participation, particularly in smaller or fragmented markets.

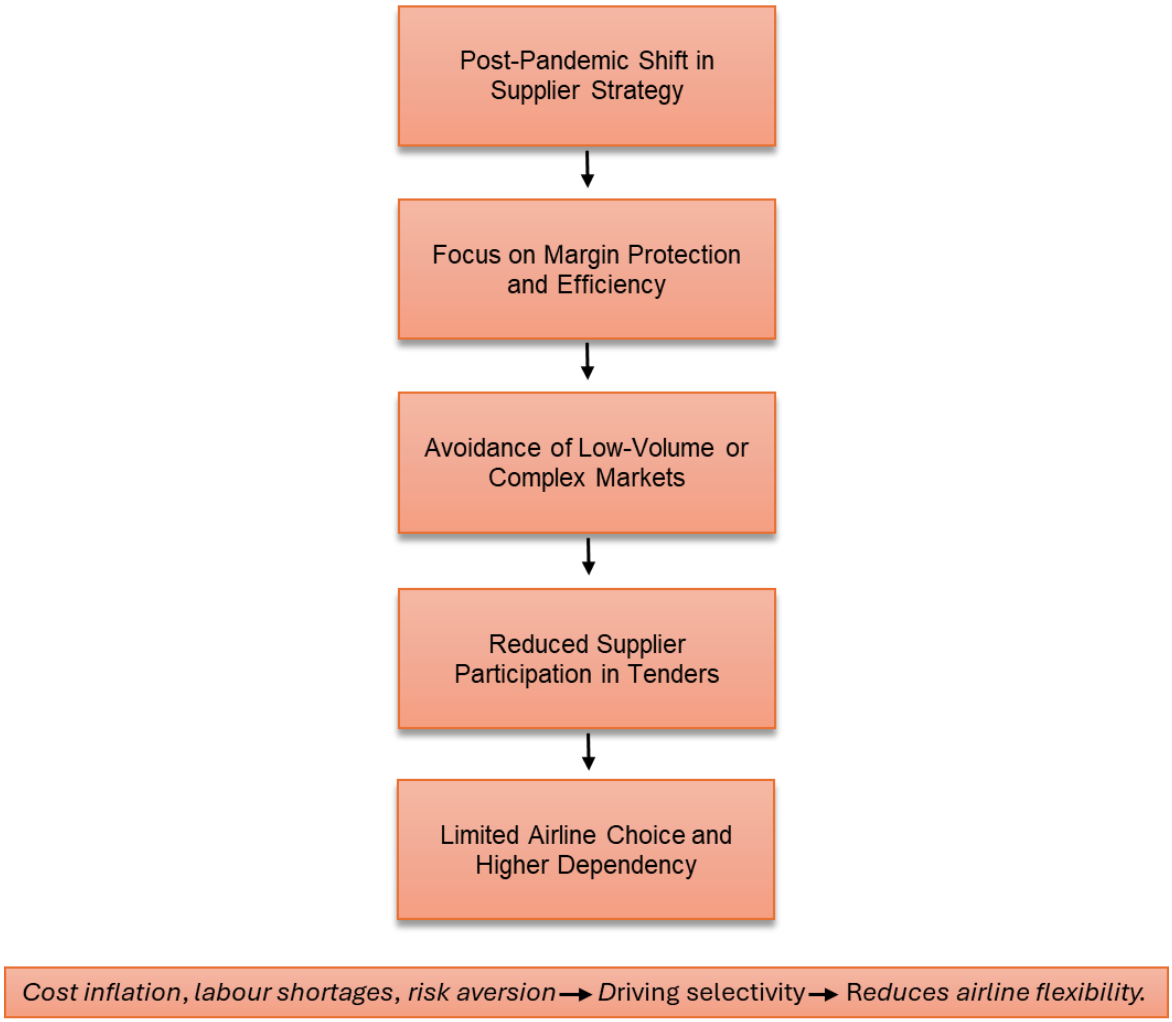

Figure 4-2 Causal Chain of Supplier Selectivity and Engagement Limitations.

Source: (Author).

4.2.2 Supplier Scarcity and Market Concentration

Participants widely agreed that a limited supplier base and regional monopolies constrain airline catering procurement. As one explained, *“Supplier scarcity, relatively few large suppliers can meet requirements” (P3)*, a view supported by P2, P4, P8, P9, and P10, who described similar limitations across Europe and regional markets.

Several also noted that scarcity often forces reliance on a single provider, particularly at smaller airports, as *“Supplier scarcity at smaller airports often leaves airlines with limited choice” (P9)* a perspective echoed by P8, P10, and P3, who observed that low competition and geographic isolation make smaller bases dependent on single providers.

Others added that such conditions reduce cost control and competition, as monopoly markets enable suppliers to dictate prices and contract terms. Overall, the findings reveal that supplier scarcity and concentration create structural dependency, limiting airlines’ ability to negotiate or diversify sourcing in constrained markets.

4.2.3 Operational Limitations and Infrastructure Constraints

Participants highlighted major infrastructure and logistical challenges affecting catering at smaller or regional airports. Several noted that “suppliers struggle to cover smaller airports effectively without local units” (P5) and that “some regional airports lack certified kitchens, creating logistical challenges” (P7). During peak tourist seasons, “supplier capacity is stretched and flexibility reduced” (P7). Others observed that “lack of nearby kitchens or chilled storage leads to higher costs and risks, as meals must travel longer distances” (P9), while “European suppliers restricted UK RFP participation to South England only due to infrastructure costs of regional airports” (P4).

Overall, limited local infrastructure, seasonal pressure, and logistical distance heighten operational risks and restrict supplier participation in peripheral markets.

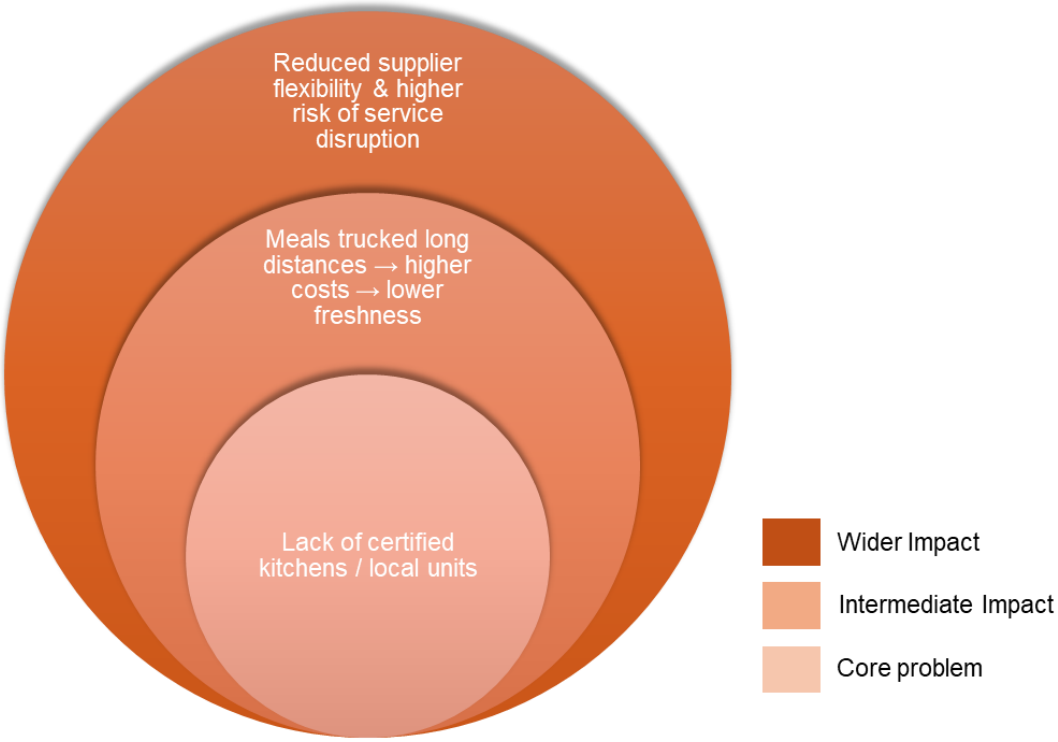

Figure 4-3 Infrastructure and Capacity Constraints in Regional Catering Operations. *Source: (Author).*

4.2.4 Regional Benchmarking and Adaptation Challenges

Participants expressed mixed views on benchmarking catering costs across regions. Some saw regional benchmarking as practical when suppliers face similar regulatory and cost conditions. “Easier to benchmark when suppliers are region-specific” (P3), a view supported by P8, P9, and P10, who noted that comparing within comparable markets or past regional contracts yields reliable insights.

Most participants, however, viewed cross-regional benchmarking as highly complex due to differing labour costs, regulations, and infrastructure. As one noted, “Benchmarking catering costs across regions is challenging because labour, regulations, and infrastructure vary significantly” (P7), echoed by P2, P3, P4, P5, P6, P8, and P10. Data confidentiality and limited transparency were also cited as barriers.

Overall, regional benchmarking is feasible and widely used, while cross-regional comparisons remain unreliable due to contextual market differences.

4.3 Supplier Attractiveness and Selection Criteria

4.3.1 Volume and Frequency as Drivers of Attractiveness

Participants identified operational scale as a primary factor influencing supplier attractiveness. As one participant noted, “Order volume (number of meals) is the most important factor” (P3, P5), a view shared by P8, P7, and P6, who agreed that higher flight volumes and regular frequencies make airlines more appealing by providing consistent demand and operational efficiency.

Predictability in scheduling was also highlighted as a critical consideration. “Regular schedules and predictable volumes make airlines more appealing” (P10), a statement supported by P9 and P4, reflected the shared view that consistency enables suppliers to plan resources, staffing, and logistics more effectively, reducing operational uncertainty.

4.3.2 Standardisation vs. Customisation

Most participants emphasised that standardisation improves efficiency and increases supplier willingness. Nine interviewees noted that consistent aircraft types, processes, and predictable schedules reduce errors and simplify operations. As one stated, “Standardisation reduces labour and errors, improving supplier willingness” (p10).

Two participants, however, pointed out that standardisation can limit differentiation, highlighting the tension between efficiency and customer-specific adaptation.

By contrast, customisation was viewed by six participants as creating inefficiency, higher error rates, and additional labour needs, with one explaining, “Fragmented or customised catering increases inefficiency, error rates, and labour needs” (p7). Still, a minority argued that controlled customisation can be profitable if it supports differentiation (p2).

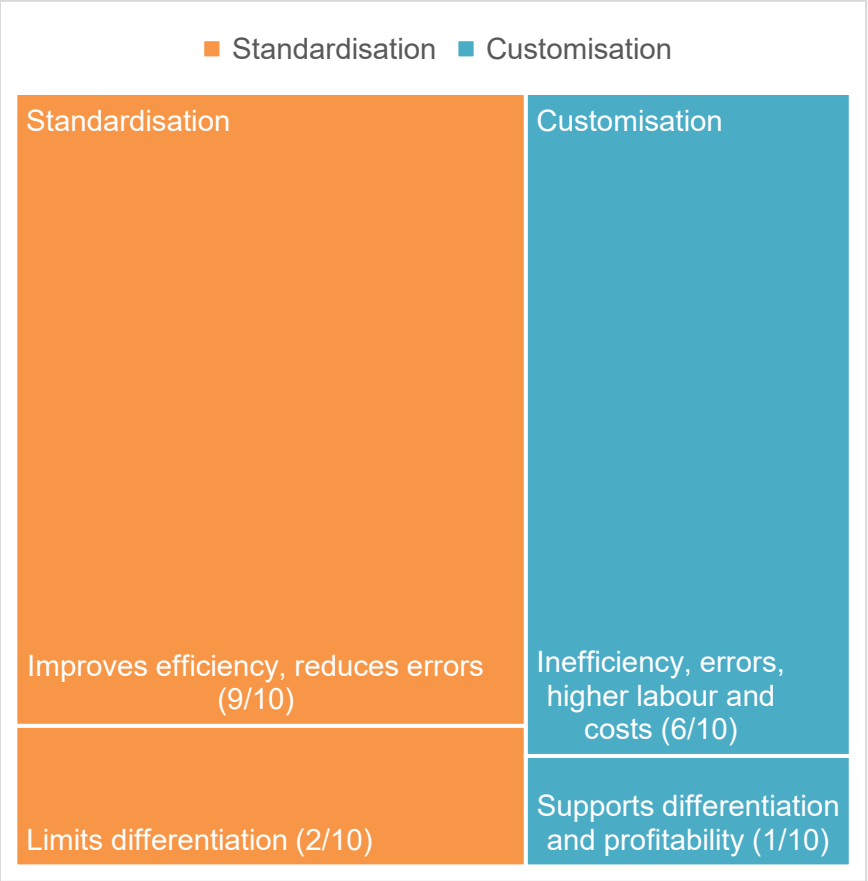

Figure 4-4 Tree map of participant perspectives on standardisation versus customisation. *Source: (Author*).

4.3.3 Supplier Profitability and Portfolio Supply

Margin opportunities were consistently identified as key to supplier attractiveness. Participants (P5, P3, P9, P2, P7, P8) noted that when suppliers provide their own product portfolios such as meals or retail items, they can earn additional revenue through markups, increasing airline appeal. As one explained, “Suppliers want to bring their own products onboard because that’s how they make their money” (P9).

Conversely, participants (P5, P2) observed that suppliers often reject tenders with low margins or high complexity. When airlines control product procurement and restrict suppliers to handling or logistics, attractiveness declines: “There’s a risk of becoming unattractive if too many products are taken in-house, reducing supplier revenue” (P5).

Overall, supplier engagement depends on margin potential where revenue opportunities exist, attractiveness rises; when constrained, collaboration diminishes.

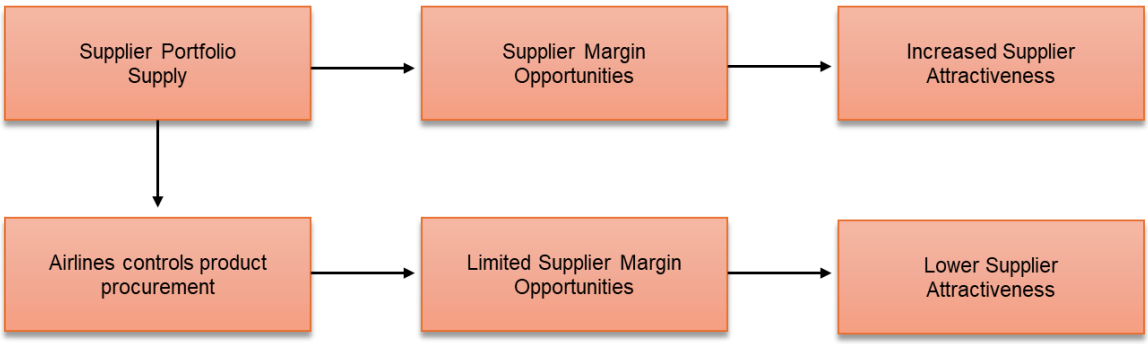

Figure 4-5 Flow diagram of supplier margin opportunities and airline attractiveness *Source: (Author).*

4.3.4 Mutual Evaluation Factors in Airline Supplier Relationships

Participants described what makes airlines attractive to suppliers and what airlines seek in suppliers. Volume and frequency were key drivers of attractiveness, with six participants (P8, P7, P3, P5, P10, P6) noting that higher flight volumes, predictable schedules, and hub concentration make airlines appealing: “Order volume (number of meals) is the most important factor” (P3, P5). Smaller volumes could still be attractive with long-term commitments (P10).

Profitability also influenced engagement. Participants (P5, P3) explained that airlines allowing suppliers to provide and markup their own products were more appealing, as margin opportunities sustain motivation.

From the airline perspective, selection centred on compliance, operational capability, and governance. Food safety was “the top priority” (P10), supported by infrastructure and regulatory approvals (P10, P9, P5, P7).

Overall, suppliers value scale, predictability, and margin potential, while airlines prioritise safety, capability, and compliance.

Table 4-1 Comparison of Mutual Evaluation Factors in Airline–Supplier Relationships *Source: (Author)*

Perspective	Criteria	Participants
Supplier view	High volumes and regular frequencies increase attractiveness	P8, P7, P3, P5, P10, P6
Supplier view	Order volume is more important than fleet size	P3, P5, P6
Supplier view	Stability and long-term commitment can offset smaller volumes	P10
Supplier view	Airlines more attractive when suppliers can supply and markup their own products	P5, P3
Supplier view	Higher margins on certain products improve attractiveness	P3
Airline view	Food safety compliance is non-negotiable	P10, P9, P2, P7
Airline view	Operational capability (cold storage, warehousing approvals, infrastructure)	P10, P5, P7
Airline view	Security clearances and regulatory approvals are essential	P5

4.4 Sourcing Models

4.4.1 Rationale for Choosing Different Sourcing Models

Participants explained that sourcing approaches in airline catering are driven by context rather than preference, with airlines adapting their models based on geography, supplier strength, and operational constraints. As one noted, *"Sourcing models must adapt to location-specific contexts"* (P2). Others

emphasised the role of supplier compatibility, explaining that *"Partnership approaches depend on DNA fit some suppliers open to strategic collaboration, others not"* (P6).

This adaptability is often a response to market limitations and cost considerations. *"Airlines either increase control and invest in in-house models or outsource and face higher long-term costs"* (P5). In regions with limited supplier competition, *"De facto monopolies reduce supplier incentive for efficiency or innovation, pushing airlines to explore alternatives"* (P6). Overall, these insights highlight that sourcing flexibility is essential to maintain efficiency, manage risk, and balance operational control with supplier capability.

4.4.2 Overview of Sourcing and Distribution Models in Practice

Participants identified four sourcing models shaped by scale, supplier capacity, and market conditions.

Warehousing models were seen as efficient in high-volume markets, where "partnerships with logistics firms centralise procurement but only work at sufficient volumes" (P7). Participants (P8, P9, P10) noted benefits in cost control and oversight, though distance can affect freshness.

Modular or hybrid sourcing allowed flexibility when "suppliers cannot meet needs efficiently or at the right cost" (P6), with others (P3, P5, P9) viewing it as a way to address supplier gaps.

Long-term partnerships were favoured for stability, as "long-term contracts reduce operational instability" (P3), supported by P5, P7, and P9 for improving predictability and alignment.

Back-catering acted as a safeguard when "destination suppliers cannot meet safety or service standards" (P8), though P6, P9, and P10 noted trade-offs with freshness and cost.

Overall, airlines balance efficiency, safety, and flexibility through context-driven sourcing models.

Sourcing Model	Used When	Advantages	Limitations / Risks
Warehousing / Centralised	High-volume, stable operations with accessible logistics	Cost control, standardisation, and efficient stock management	Requires high volume; distance may affect freshness
Modular / Hybrid	When no single supplier can meet all needs	Flexibility, shared expertise, tailored sourcing	Coordination complexity; potential duplication
Long-Term Partnership	Stable hubs and strong supplier markets	Predictability, reduced volatility, strategic alignment	Reduced flexibility: risk if partner underperforms
Back-Catering	Limited local suppliers or quality/safety concerns	Assured quality and compliance	Freshness risk, higher cost, logistical strain

Figure 4-6 Decision Matrix – Comparative Overview of Airline Catering Sourcing Models *Source:(Author)*

4.5 Evolving Trends in Airline Catering Procurement

Participants identified three key trends shaping airline catering procurement. At the strategic level, sustainability was the dominant theme, highlighted by P4, P5, P7, P8, P9, and P10, who cited growing focus on recyclable materials, waste reduction, local sourcing, and eco-friendly handling.

At the market level, participants (P2, P3, P4, P7, P10) observed a shift toward long-term contracts as suppliers seek stability amid inflation and labour shortages. Rising supplier power and margin protection were also noted by P2 and P6.

At the operational level, digitalisation and automation were viewed as essential for efficiency (P1, P2, P4, P6, P7, P8, P9, P10), with several (P3, P4, P6, P7, P8, P9, P10) emphasising data-driven forecasting to align production with demand.

Collectively, these trends reflect a shift toward sustainable, data-enabled, and stability-focused procurement strategies.

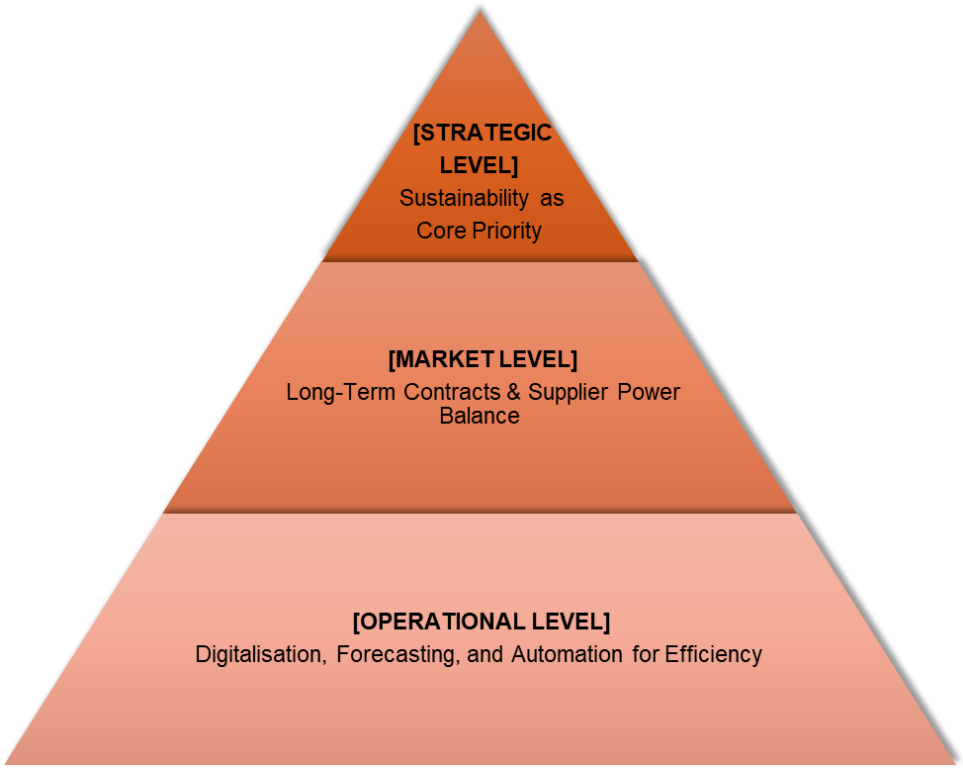

Figure 4-7 Future Direction Pyramid – Evolving Trends in Airline Catering Procurement *Source: (Author).*

5 Discussions & Recommendations

5.1 Interpretation of Findings in Relation to Research Objectives

5.1.1 Governance Dynamics under Supplier Scarcity and Selectivity

The first objective explored how supplier scarcity, monopoly risks, and supplier selectivity shape governance and buyer–supplier relationships in last-mile airline catering. Findings revealed a structural imbalance where suppliers now hold greater discretion in choosing airline partners. Participants described post-pandemic caution, capacity protection, and margin preservation as dominant supplier strategies, signalling a shift from buyer dominance to reciprocal interdependence and extending Caniëls and Gelderman's (2007) power-dependence model. Airlines increasingly compete on attractiveness through route stability, predictability, and digital compatibility rather than price.

Theoretically, this realigns Transaction Cost Economics (TCE) (Williamson, 2008). In asset-specific, uncertain, and safety-critical transactions, airlines mitigate opportunism through relational rather than competitive governance. Long-term partnerships, joint planning, and adaptability ensure continuity where switching costs are high, supporting Heide and John's (1992) view that relational norms substitute for contractual rigidity.

Thus, governance in constrained catering markets becomes hybrid: long-term contracts reinforced by trust, transparency, and digital traceability. The findings extend TCE by showing collaboration and technology as complementary safeguards where formal competition is limited.

5.1.2 Operational Complexity and Sourcing Implications

The second objective examined how perishability, regulation, and infrastructure constraints shape procurement decisions. Findings confirmed that airline catering operates as a high-reliability, low-buffer system (Vereecke & Muylle, 2006). Participants highlighted kitchen shortages, seasonal peaks, and strict delivery windows as major limitations, consistent with service-operations theory, which

views such settings as tightly coupled and requiring real-time coordination (Sampson & Froehle, 2006).

Operational complexity reinforces the need for modular sourcing. Airlines adopt warehousing, hybrid, and back-catering models to sustain continuity when local capacity is low. These reflect Voss and Hsuan's (2009) modular logic, where standardised elements menu cycles, packaging, logistics nodes can be reconfigured without redesigning the system. Modularity improves resilience but depends on digital synchronisation to prevent fragmentation.

The balance between standardisation and customisation remains critical. Standardisation improves efficiency and supplier engagement, while excessive uniformity limits differentiation. Airlines therefore align brand-specific flexibility with operational capability, confirming Silvestro's (1999) volume–variety model.

5.1.3 Contextual Application of Sourcing Models

The third objective evaluated the suitability of sourcing models in constrained environments. Findings showed that airlines use context-specific portfolios rather than a single dominant model. *Long-term partnerships* secure stability in monopoly markets, while *modular or hybrid sourcing* applies where moderate competition exists. *Back-catering* functions as a contingency when destination suppliers fail to meet safety or quality standards. This contingent use supports Hodge and Greve's (2016) and Manley and Chen's (2017) view that governance should reflect contextual uncertainty and asset specificity.

The results highlight the need for sourcing flexibility, as procurement teams shift between efficiency- and resilience-driven strategies depending on geography and volume density. This coexistence extends modular-sourcing theory beyond manufacturing, showing its applicability to service ecosystems with regulatory and perishability constraints.

Overall, last-mile catering procurement exemplifies *adaptive sourcing*, where governance, supplier attractiveness, and operational modularity are continually aligned with market conditions forming the basis for the unified sourcing framework discussed in Section 5.3.

5.2 Translating Findings into Strategic Direction

5.2.1 Realigning Governance to Market Realities

Findings reveal that governance mechanisms in airline catering must adjust to differing market structures rather than apply a uniform contracting model. In supplier-scarce or monopolistic markets, transactional contracts heighten cost volatility and dependence, whereas long-term, trust-based partnerships ensure continuity and control. This aligns with Williamson's (2008) view that governance must reflect transaction conditions, and Heide and John's (1992) argument that relational norms substitute for formal controls under uncertainty.

To illustrate this adaptive logic, Figure 5-1 positions governance modes within a Governance Market Fit Matrix, mapping governance orientation against market structure. Each quadrant represents a sourcing configuration suited to specific supplier dynamics.

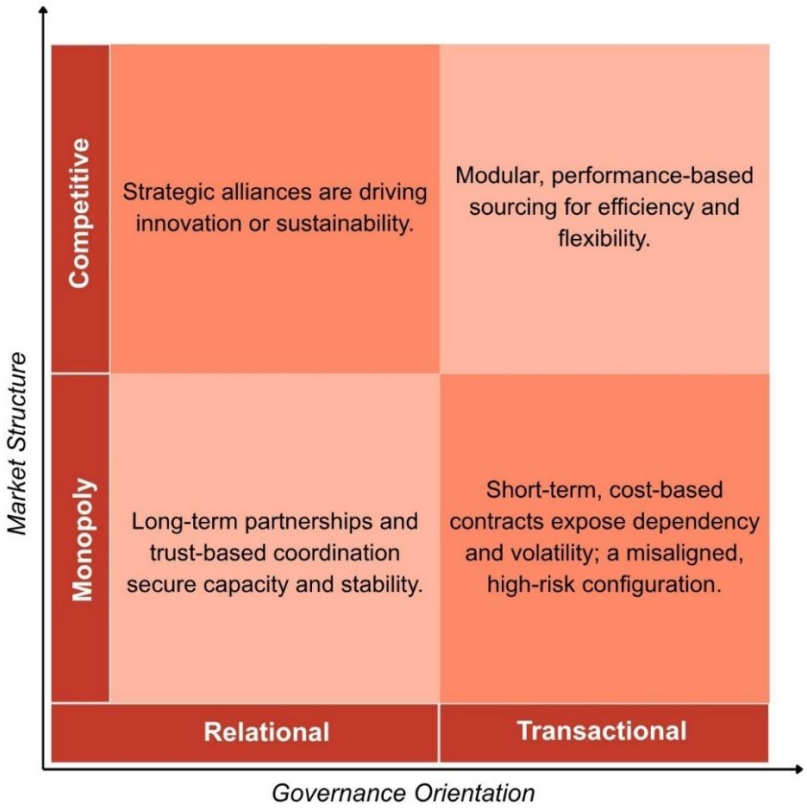

Figure 5-1 Governance Market Fit Matrix for Airline Catering Procurement *Source: (Author, adapted from Williamson, 2008; Heide & John, 1992; Caniëls & Gelderman, 2007).*

The matrix demonstrates that governance effectiveness depends on contextual alignment. *Monopoly + Relational* arrangements are optimal in constrained environments, while *Competitive + Transactional* sourcing suits mature markets. The *Monopoly + Transactional* quadrant marks a structural mismatch where cost-driven governance undermines collaboration and increases risk. This diagnostic perspective reinforces that governance should be treated as an adaptive portfolio, evolving with supplier market maturity a foundation that informs the integrated sourcing framework in Section 5.3.

5.2.2 Strengthening Supplier Relationships Through Attractiveness and Collaboration

The second strategic implication concerns the rebalancing of buyer–supplier relationships. Findings reveal that suppliers increasingly exercise selectivity, prioritising airlines offering predictable demand, margin potential, and operational stability. This finding reverses the traditional procurement paradigm in which buyers hold structural power, and positions airlines as partners competing for supplier commitment.

Airlines can sustain supplier engagement by nurturing relationship capital through transparency, shared forecasting, and mutual investment in process improvements. These interactions signal reliability and long-term value, which are crucial in supply-scarce contexts where switching costs are high for both parties. Thus, collaboration becomes a pragmatic necessity rather than an ethical aspiration. Managing attractiveness and interdependence ensures that governance structures are reinforced by trust and reciprocal advantage, a balance that extends Caniëls and Gelderman's (2007) framework of power–interdependence into modern constrained service settings.

5.2.3 Building Digital Capability as the Backbone of Procurement Integration

Digital enablement emerged as a cross-cutting condition for successful sourcing. Advanced forecasting, shared data dashboards, and automated compliance systems transform fragmented supplier interactions into integrated operational ecosystems. This aligns with Bienhaus and Haddud (2018), who found that digital

tools strengthen collaboration and process transparency across supply networks. Similarly, Kache and Seuring (2017) emphasise that data visibility enhances decision accuracy and responsiveness under uncertainty. The findings suggest that digital capability functions not merely as an operational tool but as the infrastructure of governance, aligning technology, relationships, and oversight to shift procurement from reactive control to proactive coordination.

5.3 Recommendations and Development of the Integrated Sourcing Framework

5.3.1 Strategic Recommendations

5.3.1.1 Adopt Adaptive Governance Portfolios

Procurement functions should move beyond one-size-fits-all contracting approaches and instead develop governance portfolios that reflect regional market conditions. In monopoly environments, long-term and trust-based relational partnerships are critical to safeguard continuity.

Where moderate competition exists, hybrid contracts that combine flexibility with accountability enable both collaboration and performance control. In mature and open markets, modular or performance-based sourcing promotes efficiency, innovation, and supplier competitiveness.

Such differentiation ensures that governance structures remain responsive to local supply constraints while maintaining consistency in operational outcomes.

5.3.1.2 Strengthen Supplier Collaboration and Attractiveness Management

Supplier selectivity has become a defining characteristic of post-pandemic catering supply chains. To secure engagement and priority from key suppliers, procurement teams must actively manage their attractiveness through predictable planning cycles, transparent forecasting, and shared value creation. Formal mechanisms such as supplier workshops, regular performance reviews, and joint improvement projects can reinforce collaboration while balancing dependency.

Building trust and mutual reliability transforms suppliers from mere service providers into strategic partners, contributing to supply continuity and innovation across geographically dispersed networks.

5.3.1.3 Embed Digitalisation as a Strategic Enabler

Digitalisation should underpin all sourcing and governance activities. Integrated digital tools such as dashboards, forecasting systems, and automated compliance tracking strengthen coordination, improve risk visibility, and facilitate real-time decision-making.

When embedded within governance and supplier management processes, digital platforms reduce information asymmetry and foster transparency, supporting more stable and efficient supplier relationships.

Digital integration, therefore, acts as the infrastructure of adaptive procurement, connecting strategic, operational, and relational dimensions into one cohesive system.

5.3.2 The Integrated Sourcing Framework

The three strategic recommendations above converge within the Integrated Sourcing Framework (*Figure 5-2*), which visualises procurement as an interconnected and adaptive system. The model integrates contextual realities, strategic levers, and enabling mechanisms to achieve resilient and efficient catering operations.

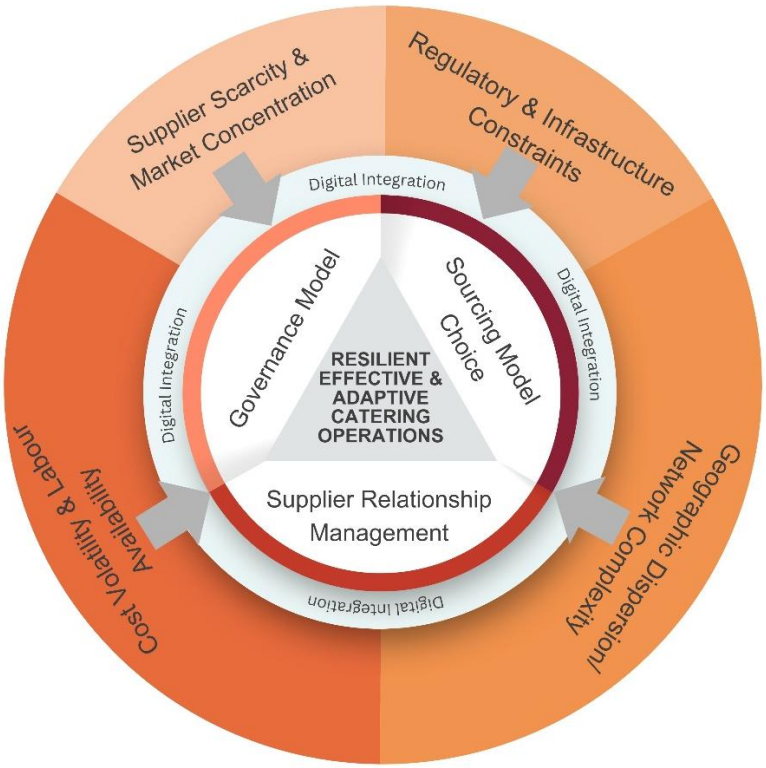

Figure 5-2 Integrated Sourcing Framework for Last-Mile Airline Catering. *Source: (Author, adapted from Williamson, 2008; Voss & Hsuan, 2009; Bienhaus & Haddud, 2018).*

5.3.2.1 Governance Model

Governance determines how contractual control and relational collaboration are combined.

- Relational governance is built on trust, transparency, and continuity. It suits monopoly or capacity-constrained markets where airlines rely heavily on a single provider and must ensure commitment through information sharing and shared risk management.
- Hybrid governance combines formal performance clauses with relational safeguards. It is appropriate for semi-competitive environments where limited supplier choice requires a balance between measurable accountability (KPIs, service credits) and cooperative flexibility (joint planning, shared contingencies).

- Modular or transactional governance relies on standardised contracts and cost benchmarking. It applies to competitive, mature markets where services are substitutable, and efficiency can be maximised through frequent tenders or performance-based incentives

5.3.2.2 Sourcing Model Choice

The sourcing model defines how production and logistics are organised across the network.

- Back-catering involves transporting prepared meals from a base station to outstations; it suits markets with inadequate local kitchens or restrictive regulations.

- Hub-and-spoke models centralise production at a regional hub that services multiple airports, balancing control with efficiency.

- Hybrid sourcing splits production between in-house or preferred partners at major hubs and external caterers in peripheral markets, providing flexibility while maintaining standardisation.

- Modular sourcing applies when mature local suppliers exist and allows standard components (menus, packaging, processes) to be sourced competitively from multiple providers.

5.3.2.3 Supplier Relationship Management

Relationship management governs the behavioural and strategic interface with suppliers. It aims to maintain reliability and engagement across geographically dispersed networks. Mechanisms such as joint forecasting, supplier workshops, and transparent performance dashboards encourage collaboration, reinforce supplier attractiveness, and build resilience against operational disruptions. This dimension complements governance and sourcing by embedding partnership practices across varying market condition.

All three dimensions are connected through a digital-integration ring, which enables data visibility, forecasting, and performance monitoring across contracts and regions. At the centre lies *Resilient, Effective and Adaptive Catering*

Operations the cumulative outcome of continuous alignment between environment, strategy, and digital infrastructure

5.3.3 The Implementation Roadmap

To operationalise the framework, the Implementation Roadmap (*Figure 5-3*) translates its conceptual logic into sequential development stages. This roadmap demonstrates how procurement maturity can evolve from establishing control to achieving strategic agility through iterative integration and optimisation.

Figure 5-3 Implementation Roadmap – Stabilise → Integrate → Optimise *Source: (Author).*

- Phase 1 Stabilise (Short Term): focuses on establishing baseline visibility and control by mapping supplier markets, identifying dependency risks, and introducing governance and digital tracking standards.

- Phase 2 Integrate (Medium Term): strengthens collaboration and data flow through hybrid contracts, forecasting systems, and supplier engagement programmes, fostering coordinated governance.
- Phase 3 Optimise (Long Term): embeds predictive analytics, portfolio evaluation, and sustainability metrics to institutionalise adaptive sourcing and continuous improvement.

The phased logic aligns with established models of procurement and organisational maturity, where capability development progresses from control and visibility toward integration and continuous improvement. This evolution reflects the principles of adaptive governance (Williamson, 2008) and digital transformation in procurement (Bienhaus & Haddud, 2018), emphasising the integration of technology, process, and collaboration over time. Each phase builds upon the previous, creating a structured yet iterative transition from compliance-driven management to data-enabled coordination and, ultimately, strategic resilience.

6 Contributions, Limitations, and Future Research

6.1 Contributions

This research contributes to both theory and practice by developing an Integrated Sourcing Framework and Implementation Roadmap that explains how procurement in airline catering can remain resilient under conditions of supplier scarcity and operational constraint.

First, it extends governance theory by demonstrating that governance structures in service procurement must adapt dynamically to market maturity, ranging from *relational* models in monopoly contexts, to *hybrid* configurations in semi-competitive settings, and *modular* approaches in mature markets.

Second, it advances understanding of supplier attractiveness and collaboration within constrained environments, showing that interdependence and reliability can be managed proactively through transparency and joint planning.

Third, it integrates digitalisation into sourcing governance, positioning digital tools as the connective infrastructure that enables coordination, performance visibility, and adaptive learning across procurement functions.

The study also provides practical contributions through the Integrated Sourcing Framework and Implementation Roadmap, which together form a dual-layer guide. The framework conceptualises how environmental, strategic, and digital dimensions interact, while the roadmap offers a phased approach Stabilise, Integrate, and Optimise for implementing adaptive sourcing maturity. These tools translate complex theoretical relationships into actionable managerial processes, offering airlines and service organisations a structured path to build resilience and efficiency.

Finally, the research makes a methodological contribution by combining theoretical constructs from governance, modularity, and digital procurement into a unified conceptual model, developed through qualitative evidence from industry practice. This approach bridges the gap between conceptual theory and applied sourcing strategy within the aviation services sector.

6.2 Limitations

While the study yields meaningful insights, several limitations are acknowledged. First, the research is based on a single organisational case, which restricts generalisability to other airlines or service industries.

Second, the study draws primarily from internal procurement perspectives; the exclusion of supplier viewpoints limits understanding of relational reciprocity and attractiveness factors.

Third, the framework is conceptual and exploratory, integrating qualitative findings with established theory rather than empirical quantification.

Lastly, its cross-sectional design captures sourcing practices at one point in time, without assessing how adaptive capability evolves through continued digital transformation.

6.3 Future Research

Future research should seek to validate and extend these findings through comparative or multi-case analyses, testing the framework across different service sectors or international contexts. Quantitative studies could measure the relationship between governance mode, digital maturity, and procurement performance outcomes.

Further exploration of supplier perspectives would enrich understanding of inter-firm dependency, cooperation, and risk-sharing mechanisms, particularly in constrained networks.

Longitudinal research could evaluate the evolution of adaptive sourcing over time, capturing how digitalisation and data-driven decision-making strengthen resilience.

Finally, future studies might examine how sustainability and innovation metrics can be embedded within governance models to extend the framework's relevance to broader organisational and environmental objectives.

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Appendix A : Ethical approval letter

6 August 2025

Dear Mr Pulimootil ,

Reference: CURES/26226/2025
Project ID: 29592
Title: Strategic Procurement in Supply-Constrained Service Environments: A Sourcing Framework for Last-Mile Airline Catering

Thank you for your application to the Cranfield University Research Ethics System (CURES).

We are pleased to inform you your CURES application, reference CURES/26226/2025 **has been reviewed. You may now proceed with the research activities you have sought approval for.**

If you have any queries, please contact CURES Support.

We wish you every success with your project.

Regards,

CURES Team

Appendix B : Informed Consent Form

Title of the project:	A sourcing framework that integrates governance flexibility, modular service delivery, digital coordination, and cost–risk optimisation can enhance supplier attractiveness and operational reliability in supply-constrained last-mile airline catering
Name of the researcher:	Christo Sibi Pulimootil
Researcher's contact details:	+44 7365842054
Date:	

B.1 Consent to Participate and Right to Withdraw

1. I confirm that I have been informed about the purpose and scope of this research project, and I agree to take part in an interview.
2. I understand that I am sharing my personal views and experiences. I am not speaking on behalf of my employer or in any official capacity.
3. I understand that my identity will be anonymised. I have been assigned a participant number, and the researcher will record data against this number instead of using my name.
4. The file linking my name to my participant number will be accessible only to the researcher and will be securely destroyed after the project is completed (expected by [insert date]).
5. I understand that I may withdraw from this project at any stage by informing the researcher, whose contact details have been provided.
6. I also understand that I can request withdrawal of my data for up to 30 days after the interview, after which it may not be possible to identify and remove my individual data from the aggregated results.

B.2 Data Handling and Security

1. I understand that the data I provide will be used for academic research purposes only.
2. Interviews will be audio-recorded (with my consent) and securely stored on a password-protected device and backed up on secure, password-protected cloud storage.
3. Audio files will be securely deleted once transcripts have been created and checked.
4. Transcripts will be anonymised by removing or replacing identifiers (such as names, roles, or locations).
5. Anonymised transcripts may be quoted in the researcher's thesis and in related publications (e.g., journal articles, conference papers).

B.3 Data Use and Publication

1. Analytical software (e.g., NVivo) may be used to organise and code interview data.
2. Every reasonable step will be taken to protect anonymity and confidentiality.
3. Aggregated findings will be published in support of the research conclusions.
4. I may choose whether or not I consent to anonymised transcript extracts being published:

   ☐Yes, I consent to anonymised transcript extracts being used in publications.

   ☐No, I do not consent to anonymised transcript extracts being used in publications.

Participant’s name:			
Participant’s signature:		**Date:**	
Researcher's signature:		**Date:**	

Appendix C : Rankings of the referred literature

Sr No.	Reference (Author, Year)	Publication / Source	Indexed on	Credibility / Rank (SJR quartile or note)
1	Caniëls, M. C. J., & Gelderman, C. J. (2007)	Industrial Marketing Management	Scopus	Q1
2	Ellram, L. M., Tate, W. L., & Petersen, K. J. (2013)	Journal of Supply Chain Management	Scopus	Q1
3	Geyskens, I., Steenkamp, J.-B. E. M., & Kumar, N. (2006)	Academy of Management Journal	Scopus	Q1
4	Hald, K. S. (2012)	Industrial Marketing Management	Scopus	Q1
5	Handfield, R. B., Straube, F., Pfohl, H.-C., & Wieland, A. (2013)	BVL International (report)	-	Institutional/ practitioner report industry evidence (not ranked)
6	Heide, J. B., & John, G. (1992)	Journal of Marketing	Scopus	Q1
7	Kähkönen, A.-K., & Lintukangas, K. (2012)	Journal of Purchasing & Supply Management	Scopus	Q1
8	Schiele, H., Calvi, R., & Gibbert, M. (2012)	Industrial Marketing Management	Scopus	Q1
9	Steinle, C., & Schiele, H. (2008)	Journal of Purchasing and Supply Management	Scopus	Q1
10	Williamson, O. E. (1991)	Administrative Science Quarterly	Scopus	Q1
11	Williamson, O. E. (2008)	Journal of Supply Chain Management	Scopus	Q1

12	IATA & Airline Catering Association (2022)	Industry update / press / report	-	Institutional professional document: practical / regulatory source
13	International Flight Services Association (n.d.) / Motley Rice (report)	Industry guidance / report	-	Institutional professional document: practical / regulatory source
14	Silvestro, R. (1999)	International Journal of Operations & Production Management	Scopus	Q1
15	Sampson, S. E., & Froehle, C. M. (2006)	Production and Operations Management	Scopus	Q1
16	Harland, C. M., Knight, L. A., Lamming, R. C., & Walker, H. (2005)	International Journal of Operations & Production Management	Scopus	Q1
17	Vereecke, A., & Muylle, S. (2006)	International Journal of Operations & Production Management	Scopus	Q1
18	Voss, C., & Hsuan, J. (2009)	Decision Sciences	Scopus	Q1
19	Airline Catering Association (2020)	ACA standard practice guide (Brussels)	Industry body	Institutional / practitioner guidance: practical source
20	Lin, Y., & Pekkarinen, S. (2011)	Journal of Business & Industrial Marketing	Scopus	Q1

21	Pekkarinen, S., & Ulkuniemi, P. (2008)	The International Journal of Logistics Management	Scopus	Q1
22	Campbell, J. F., & O'Kelly, M. E. (2013)	Transportation Science	Scopus	Q1
23	Bienhaus, F., & Haddud, A. (2018)	Business Process Management Journal	Scopus	Q1
24	Ghadimi, P., Wang, C., Lim, M. K., & Heavey, C. (2019)	Computers & Industrial Engineering	Scopus	Q1
25	Kache, F., & Seuring, S. (2017)	International Journal of Operations & Production Management	Scopus	Q1
26	Hanlon, P. (2019)	Journal of Revenue & Pricing Management	Scopus	Q3
27	Kadefors, A. (2004)	International Journal of Project Management	Scopus	Q1
28	Osei-Kyei, R., & Chan, A. P. C. (2020)	Journal of Facilities Management	Scopus	Q2
29	Zhang, A., & Zhang, Y. (2002)	Journal of Air Transport Management	Scopus	Q1
30	Hodge, G. A., & Greve, C. (2016)	Public Works Management & Policy	Scopus	Q2
31	Manley, K., & Chen, L. (2017)	International Journal of Project Management	Scopus	Q1
32	Ellram, L. M. (1995)	International Journal of Physical Distribution & Logistics Management	Scopus	Q1

33	Hypko, P., Tilebein, M., & Gleich, R. (2010)	Journal of Service Management	Scopus	Q1
34	Knight, L., Harland, C., & Telgen, J. (2007)	Public Procurement: International Cases (Routledge)	-	Reputable academic publisher book
35	van der Valk, W., & Rozemeijer, F. (2009)	Journal of Services Marketing	Scopus	Q1
36	Zsidisin, G. A., & Ellram, L. M. (2003)	Journal of Supply Chain Management	Scopus	Q1.
37	Hilal, A. H., & Alabri, S. S. (2013)	International Interdisciplinary Journal of Education	Scopus	Q4
38	Bryman, A. (2016).	Oxford University Press	-	Academic textbook
39	Creswell, J. W., & Poth, C. N. (2018)	SAGE Publications	-	Academic textbook
40	Saunders, M., Lewis, P., & Thornhill, A. (2019)	Pearson Education Limited	-	Academic textbook
41	Gioia, D. A., Corley, K. G., & Hamilton, A. L. (2012)	Organizational Research Methods	Scopus	Q1
42	Bazeley, P. (2009)	The Malaysian Journal of Qualitative Research	-	Peer-reviewed qualitative journal

Appendix D : Themes and second order codes developed in NVivo

Themes	Respondents	References
1. Supplier Attractiveness and Selection Criteria	10	134
1.1 Volume of orders or service procured is important than fleet size	9	11
1.2 Technology integration interms of forecasting and automation is important for effciency building and better coordination	7	9
1.3 Suppliers demand longer contracts or induce higher price to offset complexities	5	6
1.4 Supplier expect co-investments to satisfy airline requirements	8	8
1.5 Supplier Compliance with Safety, Quality, and Regulatory Standards	5	6
1.6 Supplier avoid taking risks when they reach capacity limitations	3	5
1.7 Suppleirs avoid contracts where they see low revenue margins	5	7
1.8 Standardisation as a Driver of Supplier Attractiveness	9	15
1.9 Operational capability of suppliers	7	13
1.10 Multi-country presence can attract larger suppliers seeking consolidation or market entry	3	4
1.11 Low order volumes discourage suppliers	4	4
1.12 Long term contract is prefered among suppliers to secure predictable revenue	8	10
1.13 Impact of Customisation on Supplier Efficiency and Profitability	8	12

1.14 Customisation increase SKU causing errors	7	8
1.15 Contract duration helps increase attractiveness	2	2
1.16 Airlines with complex operations is an operational burden for suppliers	8	9
1.17 Airline Attractiveness Linked to Supplier Margin on Product Supply	2	5
2. Sourcing Methods	10	35
2.1 Warehousing	7	7
2.2 Reasons for opting different sourcing models	3	4
2.3 Modular sourcing	7	9
2.4 Long term Partnerships	8	8
2.5 Backcatering	7	7
3. Evolving Trends in Airline Catering Procurement	10	41
3.1 Sustainability as a Core Procurement Priority	6	6
3.2 Supplier Preference for Long-Term Contracts	5	5
3.3 Shifts in Supplier Power and Profitability Focus	3	6
3.4 Menu Trend Analysis and Innovation through AI	5	5
3.5 Forecasting and Data-Driven Coordination	9	13
3.6 Efficiency and Coordination through 4PL Models	3	3
3.7 Digitalisation and Automation in Catering Procurement	3	3

4. Constrained Environments	10	57
4.1 Supplier Selectivity Based on Margin and Efficiency	6	8
4.2 Supplier scarcity forces reliance on single providers	6	6
4.3 Regional benchmarking can be done	5	5
4.4 Monopoly Environments and Supplier Disengagement	8	11
4.5 Logistical and Capacity Constraints in Supplier Operations	7	10
4.6 Cost Benchmarking as a Persistent Constrain across region	9	13
4.7 Challenges of Intermediaries and Hidden Supplier Structures	1	4

Appendix E : Interview Questions

1. Could you describe your role, how long you have been in the airline industry, and how long with TUI?
2. What are the main factors influencing the selection of catering suppliers? Do external constraints such as supplier scarcity, lack of infrastructure, or supplier unwillingness affect these decisions?
3. Can you share examples of constrained environments you have experienced across different regions (e.g., monopolies, lack of infrastructure, suppliers unwilling to engage)?
4. From your perspective, what factors generally make an airline attractive to catering suppliers (e.g., fleet size, geographical footprint, route frequency, process standardisation)?
5. Why might catering suppliers choose not to work with certain airlines? Could you share any experiences where TUI faced such challenges?
6. Do you think fragmented or highly customised catering requirements add complexity to operations, and how does this affect efficiency or supplier willingness to engage?
7. What sourcing or partnership models (e.g., long-term contracts, modular sourcing, warehousing, back catering) have you seen applied, and under what conditions do they work best?
8. Do you think technology integration (e.g., forecasting, menu trend analysis, ordering systems, 4PL) can improve coordination between airlines and suppliers?
9. Do airlines face challenges in benchmarking catering costs across regions, and how is this usually handled?
10. Have you noticed any recent trends or developments in buyer–supplier relationships or sourcing practices that are shaping airline catering procurement?