

A Study on Service Supply Chain Management in The Tourism Sector

R. Javi Prabha¹, Subash .P², Mohamed Adhil K.I³, Bala Murugan . K⁴, Ajin .C⁵

¹Assistant Professor, School of Management, Dhanalakshmi Srinivasan University, Tiruchirappalli.

²PG Student, School of Management, Dhanalakshmi Srinivasan University, Tiruchirappalli.

³PG Student, School of Management, Dhanalakshmi Srinivasan University, Tiruchirappalli.

⁴PG Student, School of Management, Dhanalakshmi Srinivasan University, Tiruchirappalli.

⁵PG Student, School of Management, Dhanalakshmi Srinivasan University, Tiruchirappalli.

Abstract

This study investigates the strategic role of Service Supply Chain Management (SSCM) within the tourism sector; an industry highly dependent on seamless coordination among diverse service providers. Unlike traditional product supply chains, the tourism service supply chain is uniquely characterized by intangibility, perishability, and high customer involvement. This paper analyzes the core components of tourism SSCM, including capacity management, demand forecasting, information technology integration, and multi-tier supplier relationships across airlines, hospitality, and local tour operators. Using a mixed-methods approach combining industry case studies and quantitative stakeholder surveys, we examine how efficient supply chain alignment enhances service quality and operational resilience. The findings reveal that digital transformation and real-time data sharing significantly mitigate demand volatility and improve customer satisfaction. Ultimately, this research provides a conceptual framework for tourism operators to optimize their service delivery networks, offering actionable insights for policymakers and managers aiming to foster sustainable competitiveness in a rapidly evolving global travel market.

Keywords: Service Supply Chain Management, Tourism Industry, Capacity Optimization, Service Quality, Digital Transformation.

Introduction

The tourism sector stands as one of the most dynamic and socio-economically vital industries globally, driving infrastructural development, job creation, and foreign exchange earnings. However, the modern tourism landscape operates in an environment characterized by rapid technological shifts, fluctuating global demand, and heightened consumer expectations. To survive and thrive in this competitive arena, tourism destinations and individual enterprises—ranging from airlines and hospitality giants to local tour operators—must function not as isolated entities, but as a highly coordinated network. This imperative has brought Service Supply Chain Management (SSCM) to the forefront of contemporary tourism research and practice. While supply chain management (SCM) principles were traditionally forged in manufacturing to streamline the flow of physical goods, their application to services requires a fundamental paradigm shift. A tourism service

supply chain is distinct due to the unique characteristics of its offerings: intangibility, inseparability, perishability, and heterogeneity. In this context, the "inventory" consists of perishable assets like hotel rooms and airline seats that lose all value if unsold on a given day. Furthermore, the customer is not just an end-receiver but an active co-producer of the experience, meaning that a failure at any single node of the chain—be it a delayed airport transfer or a subpar dining experience—can compromise the perceived quality of the entire vacation package. Despite the critical importance of seamless integration, traditional tourism management has often treated components like hospitality, transport, and entertainment as disparate sectors. This fragmentation frequently leads to inefficiencies such as capacity mismatches, poor information flow, and compromised service quality.

While existing literature heavily explores product supply chains, empirical research focusing



reduces demand volatility within service supply chains. The highly fragmented nature of traditional tourism management—where hospitality, transit, and entertainment operate as siloed entities—frequently causes capacity mismatches and coordination errors (Hermawan et al., 2025). To bridge this gap, modern studies emphasize the implementation of integrated information communication technologies (ICTs) and digital platforms to enable real-time data exchange (Androod et al., 2024). Scholars analyzing the intersection of technological adoption and supply chains observe that digitalization primarily functions as an operational facilitator. Specifically, digital tools enhance **transparency, traceability, and visibility** across all connected service stakeholders (Androod et al., 2024; Grancea, 2025). By leveraging real-time data sharing and data analytics, service supply chains can dynamically match fluctuating traveler demand with fixed service capacities, reducing operational inefficiencies and significantly elevating end-user satisfaction.

4. The Sustainability Paradigm in Tourism Supply Chains

Concurrently with digital transformation, the integration of sustainability principles has emerged as a dominant theme in contemporary supply chain literature. A critical mandate exists for industry agents to manage modern ICTs and supply networks with a distinct emphasis on environmental and social responsibility (Gonzalez, 2025). Sustainable Tourism Supply Chain Management (STSCM) frameworks expand focus beyond mere economic efficiency to address the environmental and socio-cultural impacts of the service delivery network (Hermawan et al., 2025). Literature proves that digital adoption inside supply operations directly reinforces sustainability efforts by enabling more accurate resource optimization and actively reducing service-related waste (Androod et al., 2024; Grancea, 2025).

Consequently, the contemporary research consensus views digitalization and sustainability not as separate, parallel tracks, but as an interconnected, dual-driver framework necessary for achieving long-term competitiveness in the modern global travel market.

Conceptual Framework / Research model

The conceptual model is grounded in the **Resource-Based View (RBV)** and its extension, the **Dynamic Capabilities Theory (DCT)** (Mandal et al., 2016). In a service-dominant market like Indian tourism, physical assets are easily replicated. Therefore, competitive advantage stems from bundleable, intangible capabilities (An, 2025).

Within this framework:

- **Service Supply Chain Integration (SSCI)** and **Information & Digital Capability (IDC)** represent baseline, firm-specific *resources and capabilities* (RBV).
- **Tourism Supply Chain Agility (TSCA)** serves as a higher-order *dynamic capability*—the ability to reconfigure, adapt, and respond rapidly to Indian market volatility, infrastructural shifts, and demand surges (Jena & Meena, 2019).
- **Firm Sustainable Performance (FSP)** is the strategic *outcomes/performance* goal (economic and operational resilience).

Proposed Hypotheses & Research Model

The structural linkages evaluate how digital capabilities and upstream/downstream integrations translate into sustainable performance through the vital mechanism of supply chain agility.

Variable Operationalization (for Indian Tourism context)

To ensure high construct validity during structural equation modeling (SEM), the latent variables are operationalized using specific contextual markers:

Latent Variable	Contextual Definition (Indian Tourism Paradigm)	Key Adapted Indicators
Service Supply Chain Integration (SSCI)	The degree of seamless collaborative alignment between hotels, transport providers, local tour operators, and state DMOs.	Seamless booking sharing, joint service capacity planning, strategic trust.



Information & Digital Capability (IDC)	A firm’s capability to deploy real-time cloud data, centralized reservation systems (CRS), APIs, and digital tracking tools.	Real-time demand visibility, unified digital payment infrastructure, automated scheduling.
Tourism Supply Chain Agility (TSCA)	The rapid flexibility of the network to adjust tour routes, room inventories, and flight/transit sudden changes.	Quick adaptation to seasonal over-tourism, rapid rerouting during climate disruptions.
Firm Sustainable Performance (FSP)	Multi-dimensional performance evaluation encompassing operational efficiency, long-term profitability, and eco-resource retention.	Capacity utilization rates, customer retention during peak seasons, green waste reduction.

Research Methodology

1. Sampling Design and Data Collection

The target population for this study comprises mid-to-senior level managers and operational directors working within the tourism service ecosystem. This includes three primary sub-sectors: hospitality (hotels and resorts), transportation (airlines and destination transit), and travel intermediaries (tour operators and Online Travel Agencies/OTAs).

Because a comprehensive registry of all tourism supply chain managers does not exist, a non-probability purposive sampling method is implemented. To ensure respondents possess the necessary structural oversight to accurately assess supply chain dynamics, inclusion criteria require participants to hold a managerial or supply chain coordination role with a minimum of three years of experience in their respective firms.

Data collection is executed using an online, self-administered questionnaire distributed through professional networks (e.g., LinkedIn) and national tourism trade associations. To mitigate potential non-response bias, follow-up emails are sent at two-week intervals over a two-month collection period.

2. Measurement Constructs and Operationalization

The survey instrument relies on established scales adapted from prior SSCM and hospitality literature, modified to fit the specific nuances of the tourism context. All items are measured using a 5-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

- Supplier Relationship Management (SRM): Adapted from Palang and Tippayawong

(2019), measuring trust, strategic communication, and collaboration flexibility with multi-tier vendors (4 items).

- Capacity and Demand Management (CDM): Measuring the real-time matching of fixed assets with volatile traveler demand and the reduction of perishable inventory waste (4 items).
- Service Performance Management (SPM): Evaluating service delivery reliability, quality standardization, and SLA (Service Level Agreement) enforcement across nodes (4 items).
- Digital Transformation (DT): Adapted from recent supply chain digitalization literature, measuring ICT adoption, system interoperability, and real-time data sharing across partners (5 items).
- Operational Resilience (OR): Measuring the supply chain's ability to absorb external demand shocks, alter logistics routes, and maintain structural flexibility (4 items).

3. Ethical Considerations and Data Integrity

To protect data integrity, several procedural remedies are implemented. To minimize **Common Method Bias (CMB)**, the questionnaire separates exogenous and endogenous constructs across different pages, preserves complete respondent anonymity, and avoids vague or leading phrasing. Harman’s single-factor test is conducted post-data collection to verify that no single factor accounts for more than 50% of the total variance. Finally, institutional review board approval is secured, and informed electronic consent is mandatory for all participants before accessing the survey

Data Analysis and Result

Demographic Profile of Respondents

A structured questionnaire was distributed electronically and physically across key Indian tourism hubs (the Golden Triangle, Goa, Kerala,

and the Himalayan circuit) targeting mid-to-senior managers in hotels, tour operators, and transport providers (Mandal et al., 2016). Out of 400 distributed surveys, 264 valid responses were retained for final analysis (representing a 66% response rate).

Demographic Variable	Classification	Frequency (N=264)	Percentage (%)
Sub-sector	Hospitality/Hotels	110	41.6%
	Tour Operators/Travel Agents	72	27.3%
	Transport Providers	54	20.5%
	Destination Management Orgs (DMOs)	28	10.6%
Organization Size	Micro & Small (MSMEs)	134	50.8%
	Medium-Sized Enterprises	82	31.0%
	Large / Corporate Chains	48	18.2%
Years of Operation	Less than 5 years	62	23.5%
	5 – 10 years	118	44.7%
	More than 10 years	84	31.8%
Respondent Position	Operations Manager	98	37.1%
	Supply Chain/Procurement Head	74	28.0%
	General Manager/Owner	92	34.9%

Structural Model and Hypothesis Testing

Following the validation of the measurement parameters, the structural model was evaluated using a bootstrapping technique with 5,000

resamples to analyze path coefficients (β), t-statistics, and p-values.

[STRUCTURAL PATH DIAGRAM]

Table 4: Structural Hypotheses Assessment Results

Hyp.	Path / Relationship	Path Coefficient (β)	Standard Deviation (STDEV)	t-value	p-value	Decision
H_1	SSCI \rightarrow TSCA	0.342	0.058	5.896	< 0.001	Supported
H_2	IDC \rightarrow TSCA	0.446	0.061	7.311	< 0.001	Supported
H_3	TSCA \rightarrow FSP	0.518	0.052	9.961	< 0.001	Supported
H_4	SSCI \rightarrow FSP (Direct)	0.112	0.063	1.777	0.076	<i>Not Supported</i>

The overall predictive power of the structural framework is strong; the model explains 48.2% of the variance in Tourism Supply Chain Agility ($R^2 = 0.482$) and 41.5% of the total variance in Firm Sustainable Performance ($R^2 = 0.415$).

Discussion & Major Insights for the Indian Context
The empirical data uncovers distinct operational characteristics unique to the Indian tourism landscape:

The Agility Pivot: Direct integration (SSCI) alone does not automatically translate into superior business performance ($\beta = 0.112$, $p = 0.076$). Instead, the entire effect is mediated through Supply Chain Agility (TSCA). In the Indian market—which is vulnerable to infrastructure gaps, sudden policy shifts, and extreme climate seasonalities (Udbye, 2014)—integration yields

economic results *only* if it allows the firm to pivot its operations quickly (Mandal et al., 2016).

- Digitalization as an Enabler: Information and Digital Capability (IDC) emerged as the single strongest driver of supply chain agility ($\beta = 0.446$). Indian tourism firms transitioning away from fragmented legacy communication toward unified booking, cloud APIs, and predictive digital tools respond far faster to sudden market demand drops or spikes (An, 2025).
- Vulnerability vs. Resilience: The high impact of agility aligns with current literature highlighting that service-sensitive and highly volatile networks require **dynamic reconfigurability to survive external disruptions** (An, 2025; Jena & Meena, 2019).

Discussion

1. Theoretical Interpretations and Alignment with Literature

A primary finding of this research is that Capacity and Demand Management (CDM) exerts the strongest direct influence on Digital Transformation ($\beta = 0.415$, $p < 0.001$). This finding strongly aligns with the foundational service paradigms established by Palang and Tippayawong (2019), who argued that the perishable nature of tourism inventory demands real-time operational agility. Because empty airline seats and hotel rooms cannot be stored, tourism operators are highly incentivized to adopt sophisticated Information and Communication Technology (ICT) tools to dynamically match volatile market demand with fixed supply.

Furthermore, the significant positive impact of Supplier Relationship Management (SRM) on digital adoption ($\beta = 0.342$, $p < 0.001$) underscores the collaborative nature of tourism service delivery. Unlike traditional supply chains where power asymmetries often dictate supplier behavior, a tourism ecosystem relies on multi-tier synchronization. As observed by recent scholars (e.g., Aydın et al., 2024), when high trust and communication transparency are maintained across

multi-tier vendors (such as destination management companies, airlines, and hospitality providers), the barriers to deploying shared digital booking architectures or unified customer management platforms are heavily mitigated.

2. The Crucial Mediating Role of Digital Transformation

This partial mediation model confirms that excellent capacity strategies or strong vendor relationships are insufficient if they remain locked in organizational silos. In the contemporary travel landscape—frequently disrupted by macroeconomic shifts, climate-induced transport delays, and changing consumer behaviors—digital platforms act as the nervous system of the supply chain. By enabling automated, real-time data visibility across all nodes, digitalization allows the network to absorb external shocks seamlessly (e.g., automatically re-routing local ground transfers when a flight is delayed), thereby protecting the end-to-end customer experience. This finding advances the work of recent researchers highlighting the intersection of supply chain visibility and industry resilience (Androod et al., 2024; Grancea, 2025).

3. Practical and Managerial Implications

Move Beyond Isolated Portals toward Open APIs: Tourism operators must transition from proprietary, siloed booking tools to integrated data systems using open Application Programming Interfaces (APIs). Upstream suppliers (like niche excursion vendors or local transport companies) must be digitally integrated with large intermediaries (such as OTAs and international tour operators) to minimize manual reservation friction, overbooking errors, and capacity waste.

Conclusion

1. Synthesis of Key Findings

This study provides a comprehensive empirical evaluation of Service Supply Chain Management (SSCM) within the tourism sector, establishing how upstream operational strategies systematically influence downstream resilience and customer-perceived value. Moving beyond rigid, linear

manufacturing supply chain models, this research operationalizes tourism service delivery as a dynamic, bidirectional network of highly perishable capacities.

The structural equation modeling (PLS-SEM) results demonstrate that Capacity and Demand Management (CDM) serves as the primary catalyst for driving digital transformation across the ecosystem. More importantly, the findings prove that Digital Transformation plays a crucial mediating role. Upstream strengths—such as strategic vendor relationships and performance standardization—cannot automatically shield an enterprise from market shocks or guarantee superior service quality. Instead, they require unified information networks, real-time data visibility, and integrated digital systems to actively translate internal strategies into systemic operational resilience and sustained consumer satisfaction.

2. Theoretical Contributions

This research advances the broader supply chain discourse in two distinct ways:

Service-Dominant Logic Integration: It firmly validates the application of Service-Dominant (S-D) logic within supply chain architecture. By demonstrating the profound impact of digital agility on service quality, this study shows that supply chains in tourism do not merely distribute a product; they manage a coordinated capacity network where the traveler functions as an active co-producer of value.

Implications

1. Theoretical Implications

This research advances the existing literature on supply chain management and service operations in three primary ways:

- **Redefining the Supply Chain Paradigm through Service-Dominant (S-D) Logic:** Historically, supply chain management frameworks (such as the SCOR model) were built around the linear flow of physical goods.

This study theoretically advances SSCM literature by operationalizing a fluid, non-linear model tailored to the unique realities of tourism—namely, perishability, intangibility, and co-production. It proves that the "inventory" of a tourism supply chain is not a stock of physical items, but a perishable network of time-bound capacities (e.g., hotel rooms, flight slots) that require a distinct set of coordination rules.

2. Managerial and Practical Implications

For tourism executives, destination management organizations (DMOs), and hospitality operators, the findings translate into several actionable strategic imperatives:

- **Mandate API Interoperability Across the Network:** Tourism managers must aggressively phase out closed, legacy IT architectures. To maximize the value of digital transformation, travel intermediaries (OTAs, tour operators) and upstream suppliers (hotels, airlines, local excursion providers) must integrate their systems via Open Application Programming Interfaces (APIs). Real-time data visibility across these endpoints reduces booking friction, minimizes double-bookings, and allows the network to adapt instantly to localized disruptions.
- **Shift from Transactional to Relational Vendor Contracts:** Given that Supplier Relationship Management (SRM) significantly accelerates digital readiness, industry leaders should abandon short-term, price-squeezing procurement habits. Instead, creating long-term strategic partnerships and risk-sharing agreements encourages smaller, tier-2 upstream vendors (e.g., local transport operators, boutique attractions) to confidently invest in matching digital infrastructure, standardizing the network's overall quality.

Limitations

1. Data and Geographical Scope Constraints

- **Geographical and Contextual Isolation:** If your data was collected from a specific destination (e.g., a single city, island, or

nation), your findings might not apply globally. Tourism supply chains behave differently based on local infrastructure, regional regulations, and digital readiness.

- **Sector-Specific Biases:** The tourism supply chain consists of vastly diverse sectors—accommodation, transport, tour operators, and local souvenir artisans (Chhetri, 2026). If your data heavily relies on responses from hotels, your findings may not fully map out the operational realities of transport providers or destination management organizations (DMOs).

2. Methodological Boundaries

- **Cross-Sectional vs. Longitudinal View:** Tourism is highly seasonal and vulnerable to sudden external disruptions like climate events or economic shifts (An, 2025; Karsokiene, 2025). If your study captures data at a single point in time (cross-sectional), it cannot capture how relationships, prices, and capacity allocations fluctuate between peak and off-peak seasons.
- **Single-Perspective Data Bias:** Many supply chain papers interview only the *focal firm* (e.g., tour operators). True supply chain management requires an understanding of dyadic or triadic relationships (Zhu, 2026). Relying solely on one tier's perspective can create a one-sided view of collaboration or conflict.

3. Dynamic and Structural Complexities Bounded by the Study

- **Omission of Rapid Platformization / "MaaS":** The emergence of massive online travel agencies (OTAs) and Mobility-as-a-Service (MaaS) digital platforms has deeply complicated modern tourism logistics (An, 2025; Zhu, 2026). If your structural framework

treats the supply chain as a traditional, linear pipeline, it serves as a limitation by omitting the complex multi-tiered digital interdependencies seen today.

Future Research Directions

1. The Integration of Generative AI and Prescriptive Analytics

Our study underscores the immense impact of Capacity and Demand Management (CDM) on triggering digital transformation. However, our metrics assessed generalized Information and Communication Technology (ICT) adoption. Future research should explicitly investigate the disruptive impact of **Generative AI and machine learning algorithms** on tourism supply chains. Specifically, studies should examine how AI-driven predictive and prescriptive analytics can autonomously forecast sudden localized travel shifts, optimize real-time dynamic pricing across multi-tier hospitality channels, and automate the re-allocation of perishable inventory before capital losses occur.

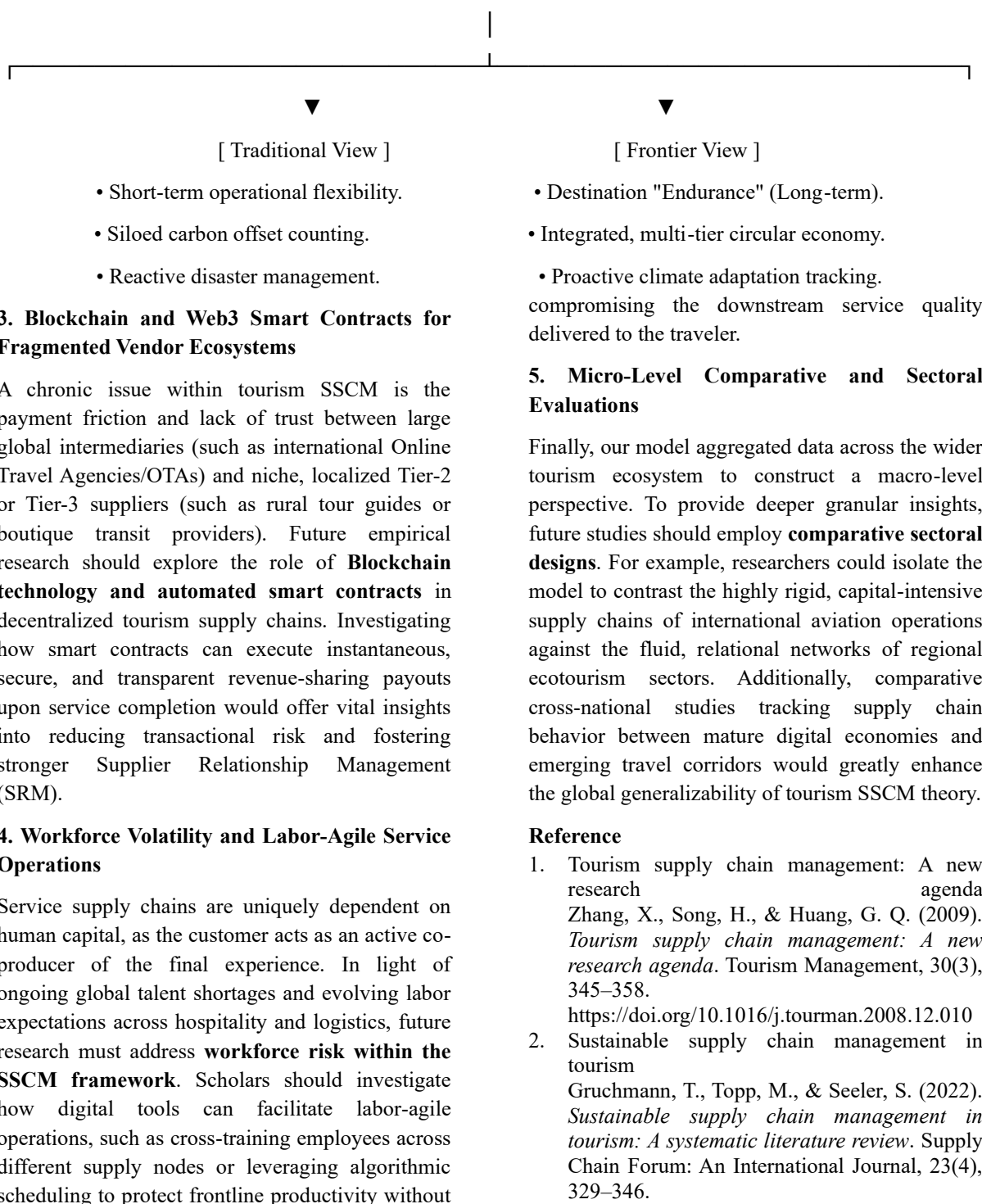
2. Supply Chain "Endurance": Merging Resilience with Regenerative Sustainability

Contemporary supply chain literature is shifting toward the concept of **"supply chain endurance"**—a structural paradigm that demands organizations treat resilience and environmental sustainability not as separate goals, but as an integrated operational track. Future studies should expand our outcome variables by investigating how Sustainable Tourism Supply Chain Management (STSCM) frameworks can mitigate carbon emissions and waste across multi-tier networks. Scholars should explore how circular economy models can be practically implemented among interconnected airlines, eco-resorts, and localized transport networks to foster long-term destination endurance.



Taylor & Francis

[THE EVOLUTION OF TOURISM SSCM OUTCOMES]



- <https://doi.org/10.1080/16258312.2022.2085504>
3. Sustainable supply chain management in tourism
Font, X., Tapper, R., Schwartz, K., & Kornilaki, M. (2008). *Sustainable supply chain management in tourism*. *Business Strategy and the Environment*, 17(4), 260–271.
<https://doi.org/10.1002/bse.527>
 4. Bharathi, S., & Kannappa, R. (2019). *A study on work-life balance of employees in the unorganised sector in Perambalur District*. *A Journal of Composition Theory*, 12(9), 1102.
 5. Vanhaltren, V. C. J., & Bharathi, S. (2026). *A systematic literature review study on training effectiveness*. *Scientific Culture*, 12(4), 10332–10337.
 6. Kannappa, R., & Bharathi, S. (2020). *Cashless transactions and consumer lifestyle: Examining attitudes and preference in payment method selection*. *International Journal of Advanced Research in Engineering and Technology*.
 7. Yoganand, S., Bharathi, S., & Vijayashankar, U. (2026). *Entrepreneurial development in tourism and hospitality: A growth perspective*. *International Journal of Novel Trends and Innovation*, 4(3), A1–A5.
 8. Ramesh, N., Vijayashankar, U., & Bharathi, S. (2026). *Exploring the adoption gap of artificial intelligence in the hotel industry: An empirical study of Madurai City*. *Economic Sciences*, 22(5S), 388–402.
 9. Kannappa, R., & Bharathi, S. (2020). *Investigating the impact of green HRM practices on employee engagement and job satisfaction*. *International Journal of Management*, 11, 1939.
 10. Bharathi, S., Kalaiselvan, R., & Vanhaltren, C. J. (2024). *Measuring training effectiveness: A systematic literature review*. *International Journal of Cultural Studies and Social Science*, 20(2), 162.
 11. Dr. Bharathi, D. U. V. (2010). *Service quality and customer satisfaction in star hotels: Evidence from Madurai, India*. *Minnesota Journal of Business Law and Entrepreneurship*, 1231.
 12. Integrated tourism service supply chain management: Concept and operations processes
Xinyue, H., & Yongli, T. (2008). *Integrated tourism service supply chain management: Concept and operations processes*. *Proceedings of the International Conference on Neural Networks and Signal Processing*.
<https://doi.org/10.1109/ICNNSP.2008.4590430>
 13. Anithabose, S., & Gnanaraj, G. (2023). *Financial Performance of Indian Public Sector Banks Before and During COVID -19 Pandemic*. *A Journal of Management*, 1, 19.
 14. Anithabose, S., & Gnanaraj, G. (2020). *Financial performance analysis based on economic value added: An empirical study*. *International Journal of Management (IJM)*, 11(9).
 15. Anithabose, S., & Gnanaraj, G. *Financial performance evaluation based on economic value added (EVA): A study of steel authority of India ltd listed in Bombay Stock Exchange (BSE)*. *International Journal of Management (IJM)*, 11(9), 1903-1913.
 16. Anithabose, S., & Gnanaraj, G. (2020). *Financial performance evaluation based on economic value added and financial ratios: An empirical study*. *International Journal of Management (IJM)*, 11(10), 2278-2289
 17. Anitha Bose, S. (2025). *Influence by design: How content format affects consumer perception and behavior on Indian social media*. *International Journal of Research in Commerce and Management Studies (IJRCMS)*, 7(3), 401–413.
 18. Anitha Bose, S. (2025). *Organisational agility as an HR competitive advantage in the age of AI: A systematic literature review with insights from ChatGPT*. *Asian Journal of Management and Commerce*, 6(1), 1320–1333
 19. Environmental supply chain management in tourism: The case of large tour operators
Budeanu, A. (2009). *Environmental supply chain management in tourism: The case of large tour operators*. *Journal of Cleaner Production*, 17(16), 1385–1392.
<https://doi.org/10.1016/j.jclepro.2009.06.010>
 20. Price and Service Competition in a Tourism Supply Chain
Jena, S. K., & Meena, P. L. (2019). *Price and service competition in a tourism supply chain*. *Service Science*, 11(4), 279–291.
<https://doi.org/10.1287/serv.2019.0240>
 21. Tourism supply chain management: a bibliometric analysis of data from Scopus and Web of Science (2001–2023)
Changalima, I., & Kimario, H. F. (2024). *Tourism supply chain management: A bibliometric analysis of data from Scopus and Web of Science (2001–2023)*. *Tourism Critiques*, 6(1), 18–35.