

Designing a Qualitative Model of Value Chain Governance for the Development of Knowledge-Based Companies in the Tourism Industry

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ABSTRACT

The primary objective of this study was to design a value chain governance model for the development of knowledge-based companies in the tourism industry using a qualitative approach. From a paradigmatic perspective, the study was grounded in an interpretive approach and employed thematic analysis to explore and provide an in-depth explanation of the dimensions, components, and underlying mechanisms of value chain governance within the context of tourism knowledge-based companies. The study population consisted of academic and executive experts. Using purposive sampling and the principle of theoretical saturation, in-depth semi-structured interviews were conducted with 20 participants. The resulting data were coded and analyzed using Braun and Clarke's (2006) thematic analysis method in MAXQDA software. To enhance the credibility and reliability of the findings, strategies including peer review, coding–recoding, and calculation of Cohen's kappa coefficient were employed. The final findings led to the identification of a structure comprising 180 basic codes, 35 organizing themes, and nine global themes: value chain architecture, value chain policymaking, interactive regulation, value-oriented culture, information integration, communication integration, continuous value optimization, value-creation dynamism, and sustainable tourism development. These themes were integrated into a comprehensive conceptual model depicting the mechanisms of value chain governance and the pathways through which they influence the sustainable development of tourism knowledge-based companies.

Keywords: value chain governance, development of knowledge-based companies, tourism industry, thematic analysis

Introduction

Tourism has evolved from a predominantly service-oriented sector into a complex, networked economic system in which value is generated through interactions among destinations, accommodation providers, transportation firms, intermediaries, digital platforms, public institutions, local communities, technology developers, and tourists. This transformation has increased the strategic importance of understanding how value is created, coordinated, distributed, and sustained across the tourism value chain. Tourism is also increasingly recognized as a driver of economic growth, employment, entrepreneurship, and regional development, although the magnitude of these effects depends considerably on institutional quality, policy effectiveness, and the capacity of tourism systems to convert resources into productive and sustainable outcomes (1, 2). Recent tourism research consequently



Article history:
 Received 21 May 2026
 Revised 14 August 2026
 Accepted 24 August 2026
 Initial Publish 24 September 2026
 Published online 10 November 2027

How to cite this article:

Jangi, J., Feizi, M., & Araei, V. (2027). Designing a Qualitative Model of Value Chain Governance for the Development of Knowledge-Based Companies in the Tourism Industry. *Journal of Management and Business Solutions*, 5(6), 1-16.
<https://doi.org/10.61838/jmbs.422>



emphasizes that value-chain analysis should move beyond the examination of isolated firms and consider the integration of multiple actors, activities, resources, and destination-level relationships. Evidence from tourism destinations demonstrates that the quality of integration across the value chain shapes both visitor experiences and the capacity of destinations to coordinate complementary services (3, 4). A systematic review of tourism value-chain research similarly indicates the growing importance of examining governance, actor relationships, coordination mechanisms, and value distribution as interconnected elements rather than as independent organizational issues (5).

The concept of value chain governance provides an appropriate theoretical lens for explaining these relationships because governance concerns the structures and mechanisms through which interdependent actors coordinate decisions, allocate responsibilities, exercise authority, manage resources, and establish the formal and informal rules governing collective action. Contemporary governance scholarship views governance as extending beyond hierarchical government control toward networks of interorganizational relationships in which public, private, and societal actors participate in processes of steering and coordination (6). In increasingly digital environments, governance also depends on the capacity of institutions to use information, connectivity, and network positioning to influence collective behavior and public outcomes (7). Within value chains, governance therefore determines not only who performs particular activities but also how information is exchanged, how standards are established, how risks and rewards are distributed, how conflicts are resolved, and how innovation is encouraged or constrained. Empirical evidence indicates that different configurations of value chain governance can significantly influence innovation performance by shaping suppliers' learning opportunities, autonomy, and access to knowledge (8). Research on global value chains likewise shows that ownership structures, organizational characteristics, and power relationships affect how firms coordinate international networks and respond to governance requirements (9).

The governance of value chains has become particularly important under conditions of uncertainty, technological disruption, regulatory change, and sustainability pressure. Traditional governance mechanisms based predominantly on contractual control and centralized decision-making may be inadequate when firms operate in dynamic networks characterized by rapid environmental change and multiple forms of interdependence. Adaptive governance emphasizes flexibility, learning, distributed coordination, and the ability to restructure relationships in response to exogenous shocks, thereby enhancing resilience within global value chains (10). Similarly, studies of sectoral value chains demonstrate that governance arrangements are embedded in historically developed structures of control, dependence, and bargaining power and may therefore determine how economic benefits and risks are distributed among actors (11). Sustainable value-chain governance further requires organizations to integrate economic objectives with social, environmental, and ethical responsibilities. New regulatory approaches, including mandatory human-rights and environmental due-diligence requirements, are increasingly changing expectations regarding corporate accountability throughout supply networks (12, 13). Accordingly, value chain governance should be understood as a multidimensional phenomenon incorporating structural coordination, regulatory arrangements, stakeholder relationships, sustainability requirements, and mechanisms for continuous adaptation.

These issues are especially significant for knowledge-based companies, whose competitive advantage depends less on conventional physical assets and more on specialized knowledge, technological capabilities, intellectual capital, innovation, data, organizational learning, and the ability to transform knowledge into commercially valuable

solutions. The resource- and knowledge-based perspectives emphasize that firm performance depends on the development, combination, and deployment of heterogeneous knowledge resources within particular organizational and interorganizational contexts (14). In small and knowledge-intensive firms, knowledge management is closely associated with business development because organizational growth requires firms to acquire external knowledge, integrate it with internal expertise, and translate it into products, services, and strategic capabilities (15). Moreover, entrepreneurial orientation and stakeholder engagement can complement knowledge-based resources and improve firm performance by strengthening opportunity recognition and the strategic use of organizational knowledge (16). Knowledge-based companies therefore require governance systems capable of facilitating knowledge exchange, experimentation, innovation, and collaboration while simultaneously protecting critical technological and intellectual assets.

The development of knowledge-based companies also depends on internal organizational conditions and the broader institutional ecosystem within which these firms operate. Knowledge employees possess specialized expertise that can generate innovation only when organizational structures allow them to communicate ideas, participate in decision-making, and exercise constructive voice (17). At the interorganizational level, knowledge sharing and networking are essential because no single knowledge-based company generally possesses all the resources required to innovate across a complex value chain. Evidence from knowledge-based industrial settings indicates that effective networking and knowledge-sharing structures can enhance collaboration among firms occupying different positions within a value chain (18). Government support can further strengthen innovation and organizational performance when it contributes to intellectual-capital development, knowledge sharing, and successful knowledge management (19). These findings suggest that the development of tourism knowledge-based companies cannot be explained solely by firm-level innovation capacity; rather, it requires attention to the governance of the wider ecosystem through which knowledge, capital, infrastructure, policies, market opportunities, and stakeholder relationships are organized.

The tourism industry presents a particularly appropriate environment for knowledge-based entrepreneurship because digital technologies increasingly mediate nearly every stage of the tourist journey, including information search, trip planning, reservation, mobility, accommodation, destination experience, payment, feedback, and post-travel engagement. Electronic tourism value-chain models increasingly conceptualize tourists as active participants in integrated digital systems rather than passive recipients of separately delivered services (20). The broader emergence of “phygital” environments, in which physical and digital experiences are interconnected, further demonstrates how digital technologies are reshaping customer interactions, service delivery, and organizational boundaries (21). In such environments, knowledge-based tourism companies can act as technological intermediaries that connect previously fragmented actors through platforms, artificial intelligence, data analytics, smart services, and digital communication systems. Broader developments in advanced computational architectures, including sophisticated attention-based neural networks, also illustrate the rapidly expanding technological capabilities available for image recognition and other data-intensive applications that may underpin future digital services (22). Accordingly, tourism value-chain governance increasingly involves not only organizational relationships but also governance of technological platforms, data architectures, algorithms, and digitally mediated interactions.

Information integration is therefore a critical component of contemporary value-chain governance. Knowledge-based firms depend on timely, accurate, interoperable, and strategically useful information generated across

multiple organizational boundaries. Research on Iranian knowledge-based companies demonstrates the importance of open-data ecosystems and innovative information flows for connecting actors and enhancing the use of organizational and environmental knowledge (23). At the same time, increasing reliance on digital platforms creates complex challenges associated with data ownership, access, quality, standardization, cybersecurity, accountability, and decision rights. Data-governance research emphasizes that organizations require explicit strategies and governance mechanisms to manage these complexities and to ensure that data can be transformed into reliable organizational value (24). Technological platform governance also intersects with intellectual-property strategy because control over standards, patents, and technological ecosystems can shape power relations and participation conditions throughout global value chains (25). In knowledge-based tourism, information integration should therefore be treated not merely as a technical issue but as a governance capability through which firms and their partners establish transparency, interoperability, strategic coordination, and appropriate protection of valuable knowledge.

Communication integration constitutes a related but conceptually distinct governance requirement. Even when information systems are technically interconnected, value creation may remain fragmented if actors lack effective channels for dialogue, negotiation, feedback, and collective decision-making. Tourism value chains are composed of heterogeneous actors with different resources, organizational cultures, interests, and levels of bargaining power. Effective coordination thus requires both formal communication mechanisms—such as contracts, committees, shared standards, and reporting systems—and informal mechanisms based on trust, relational continuity, shared norms, and interpersonal networks. Strategic planning in public institutions similarly demonstrates that implementation depends not simply on the existence of formal plans but also on institutional coordination, administrative capacity, stakeholder alignment, and the ability to overcome organizational obstacles (26). Public-service governance research further highlights the importance of designing institutional arrangements that reconcile public responsibilities with efficiency and market-oriented responsiveness (27). These considerations are particularly relevant to tourism because government agencies frequently perform regulatory, developmental, promotional, and infrastructural functions simultaneously, making effective public–private communication a prerequisite for coherent value-chain governance.

The role of government is especially important in tourism value chains because many determinants of tourism competitiveness fall outside the direct control of individual firms. Infrastructure, licensing, taxation, investment rules, destination planning, environmental protection, cultural heritage, public safety, digital connectivity, and workforce development are substantially influenced by public policy. Research on tourism development emphasizes that governmental economic policies can encourage investment and strengthen sectoral development when they create supportive institutional and financial conditions (28). At the same time, the effectiveness of such interventions depends on the extent to which policies are predictable, strategically coordinated, and aligned with the actual requirements of innovative firms. Sectoral value-chain research demonstrates that policy interventions must consider the structure of the entire chain rather than focusing on isolated producers or activities (29). For tourism knowledge-based companies, appropriate governance may therefore encompass financial incentives, intellectual-property protection, streamlined licensing, innovation grants, digital infrastructure, science and technology parks, university–industry collaboration, and policies facilitating access to domestic and international markets.

Innovation constitutes another central mechanism through which governance affects the development of knowledge-based tourism companies. Knowledge-based firms must continuously introduce new solutions, refine

existing services, and respond rapidly to changing customer expectations and competitive conditions. Organizational innovation is closely connected with knowledge transfer and quality-management practices, particularly where firms seek to integrate technological development with environmental and operational performance (30). Knowledge-based resources also play an important role in agile organizational environments because agility depends on rapid knowledge exchange, team learning, expertise integration, and adaptive decision-making (31). Industry 4.0 technologies and circular-economy approaches further demonstrate that digital transformation can support sustainable supply-chain development when technological adoption is accompanied by appropriate project-management and coordination capabilities (32). From this perspective, governance should facilitate continuous value optimization by reducing non-value-adding activities, improving service quality, increasing resource productivity, supporting experimentation, and accelerating the commercialization of innovative tourism products and services.

However, innovation should not be assessed solely in terms of speed or commercial performance. Increasing environmental pressures require knowledge-based economies to align technological innovation with green growth and sustainable resource utilization (33). Studies of environmentally oriented technologies likewise indicate that innovation can contribute to environmental sustainability when knowledge-intensive economies direct technological capabilities toward reductions in resource use and ecological impacts (34). Evidence from integrated production systems in other sectors also illustrates that coordinated management practices can generate simultaneous improvements in system quality and productive outcomes, reinforcing the broader principle that integration across interdependent activities may produce benefits that fragmented interventions cannot readily achieve (35). For tourism knowledge-based companies, sustainable value creation consequently requires technologies and business models that address energy efficiency, carbon reduction, waste management, biodiversity protection, responsible destination management, local economic participation, and preservation of cultural resources. These objectives broaden the governance agenda from immediate firm performance to the long-term economic, social, and environmental viability of the tourism ecosystem.

Global value-chain scholarship further demonstrates that sustainability strategies are shaped by stakeholder pressures, resource dependencies, and the distribution of authority among chain actors. Research integrating stakeholder theory, global value-chain theory, and resource-dependence theory suggests that sustainability strategies emerge through the interaction of organizational interests, external demands, and dependence relationships rather than through unilateral firm decisions (36). Similarly, governance in global industries must accommodate both competitive pressures and sustainable development objectives, requiring mechanisms that coordinate geographically dispersed and organizationally heterogeneous participants (37). This issue has particular significance in tourism because tourism products are inherently composite: the visitor's experience is jointly produced by multiple actors, and deficiencies in one component may reduce the value created by the entire destination network. Consequently, tourism knowledge-based companies require a governance environment capable of aligning diverse actors around shared value-creation objectives while maintaining sufficient flexibility for technological innovation, localization, and adaptation to destination-specific conditions.

Technological change also generates new possibilities for reducing coordination and transaction costs within interorganizational networks. Blockchain, for example, has been examined as a governance technology capable of supporting transparency, traceability, verification, and decentralized coordination, although its cost-effectiveness depends on contextual and transaction-specific characteristics (38). Such technologies are relevant conceptually

because they illustrate how governance mechanisms increasingly become embedded within digital infrastructures rather than residing exclusively in contracts or organizational hierarchies. As tourism knowledge-based companies expand their reliance on platforms, artificial intelligence, interconnected databases, and digitally enabled partnerships, governance must simultaneously address technological interoperability, trust, access rights, transaction efficiency, and accountability. These developments reinforce the need for governance models that integrate structural, regulatory, informational, communicative, cultural, and technological dimensions rather than treating them separately.

Despite the expanding literature on tourism value chains, knowledge-based firms, governance, digital transformation, and sustainability, significant conceptual fragmentation remains. Tourism studies have increasingly examined individual dimensions such as economic outcomes, destination experiences, electronic value chains, and actor integration (1, 3, 20), while value-chain governance research has developed sophisticated explanations of innovation, sustainability, regulatory compliance, and power relations in other industrial and global contexts (8, 39). Sustainable supply-chain research specifically emphasizes the need for governance arrangements capable of aligning multiple stakeholders, environmental responsibilities, ethical expectations, and long-term performance (39). Nevertheless, these bodies of knowledge do not yet provide an integrated explanation of how value-chain governance should be configured for knowledge-based companies operating specifically within tourism ecosystems. The distinctive combination of technological intensity, service interdependence, public-sector involvement, destination embeddedness, information dependence, and sustainability pressures creates a context in which models developed for conventional manufacturing or linear supply chains may be insufficient.

Accordingly, a comprehensive model of value chain governance for tourism knowledge-based companies should identify not only the structural architecture of the chain but also the policies governing participation, the formal and informal mechanisms regulating interaction, the cultural values supporting collaboration, the systems integrating information and communication, the mechanisms enabling continuous optimization, and the dynamic capabilities through which knowledge-based firms transform governance arrangements into innovation and sustainable value creation. Such a model should also recognize that value-chain development is not a linear sequence of transactions but a dynamic governance process involving reciprocal interactions among institutional conditions, organizational capabilities, technological infrastructures, and stakeholder relationships. By developing such an integrated framework from the experiences and interpretations of experts directly familiar with tourism, governance, and knowledge-based ecosystems, qualitative inquiry can reveal context-sensitive mechanisms that may remain obscured in models based solely on predetermined quantitative variables.

Therefore, the aim of the present study was to design a qualitative model of value chain governance for the development of knowledge-based companies in the tourism industry.

Methods and Materials

From a philosophical perspective, the present study is situated within the constructivist-interpretive paradigm, as its ontology is grounded in relativism and the plurality of socially constructed realities, while its epistemology is based on meaning-making interaction between the researcher and participants (Guba & Lincoln, 1994; Creswell & Poth, 2018). Accordingly, in terms of purpose, the study can be classified as applied-developmental research because it simultaneously seeks to generate new theoretical understanding of governance mechanisms and to formulate an applicable model for policymaking in the development of tourism knowledge-based companies. In

terms of reasoning logic, the study follows an inductive approach, with the analytical process progressing from granular data—codes emerging from interview transcripts—to higher-order abstractions, namely organizing and global themes; in other words, the final model emerges from the data. To identify, organize, and interpret latent patterns of meaning within the data, thematic analysis based on Braun and Clarke's (2006) six-phase framework was employed. The principal advantage of this strategy lies in its methodological flexibility in moving simultaneously from the descriptive level of the data to the interpretive level of underlying mechanisms. Data coding was conducted using Attride-Stirling's (2001) thematic network approach, which organizes the structure of findings at three distinct levels: basic themes (semantic codes derived from the text), organizing themes (conceptual clusters resulting from the integration of basic themes), and global themes (higher-order metaphors and core categories of the model). Sampling was purposive and information-oriented, supplemented by chain-referral snowball sampling. The inclusion criteria were: (a) at least five years of research or executive experience related to tourism, governance, or the knowledge-based ecosystem; (b) theoretical or practical expertise regarding tourism value chain mechanisms; and (c) informed willingness to participate and availability for an in-depth interview. Sampling was terminated according to the principle of theoretical saturation; that is, data collection continued until additional interviews no longer contributed any new basic themes or conceptual dimensions to the thematic network. Saturation was reached after the seventeenth interview; however, three additional confirmatory interviews were conducted to ensure the robustness of the findings, resulting in a final expert panel of 20 participants. The demographic composition of the panel was structured to reflect the interdisciplinary nature of the research topic. Table 1 presents the distribution of the participants' demographic characteristics.

Table 1. Demographic Characteristics of the Participants

Variable	Category	Frequency	Percentage
Gender	Male	12	60
	Female	8	40
	Total	20	100
Educational degree	Doctorate	16	80
	Master's degree	4	20
	Total	20	100
Field of study	Public Administration	6	30
	Tourism Management	5	25
	Business Management	4	20
	Other	5	25
	Total	20	100

As shown in Table 1, in terms of educational attainment, the majority of experts (80%) held doctoral degrees, while 20% held master's degrees, collectively indicating a high level of theoretical and research expertise in fields related to the subject of the study. Regarding gender, men constituted 60% of the sample and women 40%. This relatively balanced distribution contributed to diversity of perspectives and reduced the likelihood of bias in expert judgments. In terms of field of study, the largest proportion consisted of specialists in Public Administration (30%), which is directly related to the governance-oriented nature of the research topic. This group was followed by Tourism Management specialists (25%) and experts from other related disciplines, including technology and economics (25%), while Business Management specialists accounted for 20%, completing the interdisciplinary composition of the panel. To assess the reliability of the interview coding process, inter-coder agreement and Cohen's kappa coefficient were employed. This approach is among the most commonly used methods for assessing reliability in qualitative analyses and evaluates the degree of consistency and coherence in data interpretation by comparing

the independent coding performed by two researchers. The results of the comparison between the coding conducted by the two researchers are presented in Table 2.

Table 2. Inter-Coder Reliability Assessment (Cohen's Kappa Coefficient)

Indicator	Value	Significance Level	Result
Total number of identified codes	180	—	—
Number of observed agreements	152	—	—
Kappa coefficient	0.78	0.000	Excellent agreement

According to the results presented in Table 2, of the 180 initial codes extracted from the interview transcripts, agreement between the primary coder and the independent coder was observed in 152 cases. The calculated kappa coefficient was 0.78. Values above 0.70 indicate very good agreement and a high level of reliability among analysts. In addition, several complementary strategies were employed to assess the validity of the qualitative findings. First, content validity was established through participant review of the coding results to ensure that the extracted themes were consistent with participants' experiences and perspectives. Second, theoretical validity was assessed by comparing the identified themes with the theoretical foundations of the study and the findings of previous research. Third, the transferability of the findings was enhanced through rich and detailed descriptions of the research context, participant characteristics, and data collection process. The primary data collection instrument was the semi-structured interview. Interviews were conducted based on a developed interview guide comprising key exploratory questions. The interviews were conducted either face-to-face or online, and each interview lasted between 45 and 80 minutes.

Findings and Results

In the qualitative phase of the study, thematic analysis based on Braun and Clarke's (2006) six-phase model was employed. Accordingly, after reviewing the theoretical foundations and conducting in-depth interviews, the qualitative data were imported into MAXQDA. Subsequently, using Attride-Stirling's (2001) thematic network approach, coding was performed at three levels: basic, organizing, and global themes. During this process, concepts exhibiting thematic relationships were initially categorized into basic codes, subsequently organized into higher-order organizing themes, and finally transformed into the global themes of the model on the basis of their theoretical interrelationships. The findings are presented in Table 3.

Table 3. Thematic Network of the Study

No.	Basic Theme (Measurement Indicator)	Organizing Theme (Dimension)	Global Theme
1	Geographic extent of coverage of knowledge-based tourism services	Geographic scope of the knowledge-based chain	Value Chain Architecture
2	Number of tourism destinations covered by the knowledge-based company's technology		
3	Number of destination countries in which the knowledge-based company operates		
4	Percentage of domestic destinations geographically covered by knowledge-based services		
5	Geographic and cultural diversity of the knowledge-based company's users/customers		
6	Complexity of the knowledge-based company's partner network structure	Structural complexity of the knowledge-based chain	
7	Number of intermediary layers in the knowledge-based company's relationships with partners		
8	Diversity of partner types of the knowledge-based company (hotels, agencies, transportation, content providers)		

9	Use of network/platform-based rather than linear models by the knowledge-based company		
10	Extent of the knowledge-based company's need for coordination among different chain actors		
11	Strength of the knowledge-based company's ties with value chain actors	Strength of knowledge-based chain linkages	
12	Frequency of the knowledge-based company's formal interactions (contracts, memoranda of understanding)		
13	Depth of the knowledge-based company's long-term relationships with key chain partners		
14	Level of mutual trust between the knowledge-based company and other chain actors		
15	Level of risk and reward sharing by the knowledge-based company in joint projects		
16	Flexibility of the knowledge-based company in modifying the chain structure	Structural flexibility of the knowledge-based chain	
17	Speed with which the knowledge-based company can change partners or distribution channels		
18	Ease of entry and exit of new actors in the knowledge-based company's value chain		
19	Ability of the knowledge-based company to adapt to sudden changes in the tourism market		
20	Diversity of the knowledge-based company's distribution and customer communication channels		
21	Government support and incentive policies for tourism knowledge-based companies	Supportive and incentive policies specific to tourism knowledge-based companies	Value Chain Policymaking
22	Extent of financial and credit facilities allocated to tourism knowledge-based companies		
23	Diversity and scope of tax and customs exemptions for tourism knowledge-based companies		
24	Support for research, development, and innovation in knowledge-based companies through grants and incentives		
25	Extent of specialized consulting and acceleration services provided to tourism knowledge-based companies		
26	Regulatory policies facilitating the activities of tourism knowledge-based companies	Regulatory and facilitative policies for knowledge-based company activities	
27	Transparency and predictability of regulations for tourism knowledge-based companies		
28	Speed and ease of licensing procedures for tourism knowledge-based companies		
29	Legal protection of intellectual property and innovations of knowledge-based companies		
30	Laws facilitating foreign investment in tourism knowledge-based companies		
31	Policies for developing the infrastructure and ecosystem of knowledge-based tourism	Policies for developing the knowledge-based tourism infrastructure and ecosystem	
32	Government investment in digital infrastructure required by tourism knowledge-based companies		
33	Establishment and development of science and technology parks and innovation centers dedicated to knowledge-based tourism		
34	Support for collaboration among tourism knowledge-based companies, industry, universities, and government		
35	Development of national data-sharing platforms for tourism knowledge-based companies		
36	Human capital development policies for tourism knowledge-based companies	Human capital development policies specific to tourism knowledge-based companies	
37	Extent of support for specialized training required by tourism knowledge-based companies		

38	Joint university–industry programs for training specialized human resources in knowledge-based tourism		
39	Incentives for attracting and retaining talented professionals in tourism knowledge-based companies		
40	Support for the exchange of expertise and skills among knowledge-based companies within the tourism chain		
41	Formal coordination mechanisms between the knowledge-based company and chain partners	Formal knowledge-based coordination mechanisms within the chain	Interactive Regulation
42	Existence of clear and comprehensive contracts between the knowledge-based company and its partners		
43	Number and effectiveness of joint committees involving the knowledge-based company and chain actors		
44	Existence of shared operational standards between the knowledge-based company and chain partners		
45	Regular meetings between the knowledge-based company and value chain parties		
46	Informal coordination mechanisms of the knowledge-based company within the chain	Informal knowledge-based coordination mechanisms within the chain	
47	Level of mutual trust and goodwill between the knowledge-based company and chain actors		
48	Existence of shared norms and unwritten rules governing cooperation between the knowledge-based company and partners		
49	Participation of the knowledge-based company in social networks and informal tourism events		
50	Personal relationships between managers of the knowledge-based company and key chain managers		
51	Resolution of conflicts between the knowledge-based company and chain actors	Conflict resolution within the knowledge-based tourism chain	
52	Speed and efficiency of the knowledge-based company in resolving disputes with chain partners		
53	Use of alternative dispute resolution methods by the knowledge-based company		
54	Willingness of the knowledge-based company to negotiate and identify win–win solutions within the chain		
55	Preference of the knowledge-based company for maintaining long-term relationships with chain partners		
56	Risk and reward sharing by the knowledge-based company within the tourism chain	Risk and reward sharing within the knowledge-based chain	
57	Transparent agreements for allocating risks in joint projects		
58	Profit-sharing mechanisms between the knowledge-based company and chain partners		
59	Willingness of the knowledge-based company to engage in joint investment with chain actors		
60	Joint evaluation of the performance of the knowledge-based company and chain partners		
61	Innovation and creativity values in tourism knowledge-based companies	Innovation and creativity values of tourism knowledge-based companies	Value-Oriented Culture
62	Encouragement of idea generation and experimentation with new initiatives in the tourism knowledge-based company		
63	Degree of risk tolerance and acceptance of failure in the innovation process		
64	Allocation of time and resources to innovative tourism activities		
65	Existence of mechanisms for rewarding innovation in tourism knowledge-based companies		
66	Customer-oriented and stakeholder-oriented values of tourism knowledge-based companies	Customer- and stakeholder-oriented values of tourism knowledge-based companies	

67	Focus of the knowledge-based company on understanding tourists' needs and expectations		
68	Efforts by the knowledge-based company to exceed the expectations of chain stakeholders		
69	Systems for collecting and analyzing tourist feedback within the knowledge-based company		
70	Attention to social and environmental dimensions in the provision of tourism services		
71	Collaboration and synergy values of knowledge-based companies within the tourism chain	Collaboration and synergy values within the knowledge-based tourism chain	
72	Willingness to engage in teamwork and knowledge sharing within the tourism knowledge-based company		
73	Willingness of the knowledge-based company to collaborate with other tourism value chain actors		
74	Existence of shared spaces for exchanging ideas between the knowledge-based company and chain partners		
75	Facilitation of knowledge and specialist mobility between the knowledge-based company and chain partners		
76	Learning and continuous improvement values in tourism knowledge-based companies	Learning and continuous improvement values of tourism knowledge-based companies	
77	Commitment of the knowledge-based company to employee training and skills development in tourism		
78	Use of tourist feedback by the knowledge-based company to improve processes and services		
79	Analysis of failures by the knowledge-based company to derive lessons within the tourism chain		
80	Adoption of new technologies and novel tourism work practices by the knowledge-based company		
81	Integration of the knowledge-based company's information systems with the tourism chain	Integration of knowledge-based information systems within the chain	Information Integration
82	Number of information systems connecting the knowledge-based company with chain partners		
83	Extent of the knowledge-based company's use of shared data-exchange platforms with partners		
84	Interoperability of the knowledge-based company's information systems with the tourism chain		
85	Existence of common data-formatting standards between the knowledge-based company and partners		
86	Quality and accuracy of information generated by the tourism knowledge-based company	Quality and accuracy of knowledge-based information within the tourism chain	
87	Accuracy and completeness of data collected by the knowledge-based company		
88	Timeliness of information provided by the knowledge-based company to the chain		
89	Level of integration of the knowledge-based company's data obtained from different tourism-chain sources		
90	Chain partners' confidence in the quality of information generated by the knowledge-based company		
91	Accessibility and sharing of the knowledge-based company's information within the chain	Accessibility and sharing of knowledge-based information within the chain	
92	Ease of access to the knowledge-based company's information by authorized chain actors		
93	Speed of sharing critical information by the knowledge-based company within the tourism chain		
94	Existence of security protocols for protecting chain data		
95	Transparency of the knowledge-based company regarding the collection and use of tourism information		
96	Analysis and utilization of tourism-chain information by the knowledge-based company	Analysis and utilization of tourism-chain information	

97	Use of big data analytics tools by the knowledge-based company in tourism		
98	Use of artificial intelligence by the knowledge-based company to extract insights from tourism data		
99	Ability of the knowledge-based company to transform tourism data into strategic decisions		
100	Identification of new tourism opportunities through data analysis		
101	Diversity of the knowledge-based company's communication channels with tourism-chain actors	Diversity of communication channels within the knowledge-based tourism chain	Communication Integration
102	Use of diverse communication tools by the knowledge-based company with chain partners		
103	Existence of effective formal and informal communication channels between the knowledge-based company and chain actors		
104	Access of the knowledge-based company to up-to-date communication tools for chain management		
105	Use of specialized social networks to communicate with tourism stakeholders		
106	Frequency and timeliness of the knowledge-based company's communications within the tourism chain	Frequency and timeliness of communications within the knowledge-based chain	
107	Frequency of communication between the knowledge-based company and key chain actors		
108	Speed of the knowledge-based company's response to communication requests from chain partners		
109	Regular updating of partners regarding information and the status of knowledge-based projects		
110	Timely communication of changes and opportunities within the tourism chain		
111	Quality and effectiveness of the knowledge-based company's communications within the tourism chain	Quality and effectiveness of communication within the knowledge-based tourism chain	
112	Clarity and comprehensibility of the knowledge-based company's messages to chain partners		
113	Extent of active listening and constructive feedback in the knowledge-based company's chain interactions		
114	Reduction of misunderstandings arising from communication between the knowledge-based company and chain actors		
115	Use of shared language and agreed terminology within the chain		
116	Governance of the knowledge-based company's communications within the tourism chain	Communication governance within the knowledge-based tourism chain	
117	Existence of clear communication protocols and procedures between the knowledge-based company and chain partners		
118	Role of the knowledge-based company's leaders in promoting open and transparent communication within the chain		
119	Participation of all organizational levels of the knowledge-based company in chain communication processes		
120	Existence of tools within the knowledge-based company for evaluating the effectiveness of chain communications		
121	Continuous improvement of the knowledge-based company's processes within the tourism chain	Continuous improvement of knowledge-based processes within the tourism chain	Continuous Value Optimization
122	Reduction in the cycle time for delivering knowledge-based services/products within the tourism chain		
123	Reduction in the knowledge-based company's operating costs throughout the value chain		
124	Increased productivity of the knowledge-based company's human, financial, and technological resources within the chain		

125	Implementation of agile methods in the development of knowledge-based tourism services		
126	Improvement in the quality of knowledge-based tourism products/services	Improvement in the quality of knowledge-based tourism products/services	
127	Improvement in tourist satisfaction indicators for the knowledge-based company's services		
128	Reduction in tourist complaints regarding the knowledge-based company's services		
129	Improvement in key performance indicators of knowledge-based tourism services		
130	Acquisition of quality certifications and international standards by the knowledge-based company		
131	Reduction of waste and losses in tourism knowledge-based companies	Reduction of waste and losses within the knowledge-based tourism chain	
132	Reduction in errors and rework in the processes of tourism knowledge-based companies		
133	Reduction in energy and resource consumption in the knowledge-based company's operations		
134	Optimal management of inventory and logistics for knowledge-based tourism services		
135	Identification and elimination of non-value-adding activities in tourism knowledge-based companies		
136	Increased workforce productivity in tourism knowledge-based companies	Increased workforce productivity in tourism knowledge-based companies	
137	Increased per-employee output in the knowledge-based company (number of projects/tourism services delivered)		
138	Improvement in the specialized skills of employees of tourism knowledge-based companies		
139	Reduction in turnover among key employees of tourism knowledge-based companies		
140	Extent of technology use by the knowledge-based company to improve employee efficiency		
141	Speed of innovation and introduction of new products/services by the tourism knowledge-based company	Speed of innovation and new-product introduction in knowledge-based tourism	Value-Creation Dynamism
142	Number of new knowledge-based products/services introduced in the tourism sector annually		
143	Time required by the knowledge-based company to commercialize a new tourism idea		
144	Percentage of the knowledge-based company's revenue generated from new tourism products/services		
145	Competitive position of the tourism knowledge-based company among innovative competitors		
146	Quality and differentiation of innovations developed by the tourism knowledge-based company	Quality and differentiation of knowledge-based tourism innovations	
147	Degree of uniqueness and complexity of technologies employed by the knowledge-based company		
148	Registration of new patents and intellectual property rights by the tourism knowledge-based company		
149	External evaluation of the competitive advantage of knowledge-based tourism products/services		
150	Receipt of innovation awards and recognitions by the tourism knowledge-based company		
151	Adaptation of the knowledge-based company to market changes and tourists' needs	Adaptation of knowledge-based companies to market changes and tourist needs	
152	Speed of the knowledge-based company's response to changes in tourist demand		
153	Capacity to personalize and customize knowledge-based services for tourists		
154	Success rate of the knowledge-based company's new products in the tourism market		
155	Ability of the knowledge-based company to forecast future tourism-industry trends		

156	Market share and growth of the tourism knowledge-based company	Market share and growth of tourism knowledge-based companies	
157	Increase in the knowledge-based company's market share in the tourism sector		
158	Annual revenue growth rate of the tourism knowledge-based company		
159	Penetration of the knowledge-based company into new tourism markets (domestic/international)		
160	Increase in the brand equity of the tourism knowledge-based company		
161	Environmental sustainability in the activities of tourism knowledge-based companies	Environmental sustainability of tourism knowledge-based companies	Sustainable Tourism Development
162	Reduction in carbon footprint and energy consumption in knowledge-based tourism services		
163	Reduction in waste generation and promotion of recycling through knowledge-based tourism solutions		
164	Protection of biodiversity and natural resources at destinations through knowledge-based technologies		
165	Use of green technologies by the knowledge-based company in developing tourism infrastructure		
166	Sociocultural sustainability in the services of tourism knowledge-based companies	Sociocultural sustainability of tourism knowledge-based companies	
167	Participation of the knowledge-based company in distributing the economic benefits of tourism to local communities		
168	Preservation and promotion of destination cultural heritage through knowledge-based solutions		
169	Increasing public awareness of social responsibility through knowledge-based platforms		
170	Reduction in the adverse social impacts of tourism through intelligent knowledge-based management		
171	Economic sustainability of tourism knowledge-based companies	Economic sustainability of tourism knowledge-based companies	
172	Creation of sustainable employment opportunities through the development of tourism knowledge-based companies		
173	Equitable distribution of tourism's economic benefits through knowledge-based platforms		
174	Diversification of knowledge-based tourism products to reduce economic dependence		
175	Attraction of long-term and responsible investment in tourism knowledge-based companies		
176	Sustainability of ethics-oriented management in tourism knowledge-based companies	Sustainability of ethics-oriented management in tourism knowledge-based companies	
177	Existence of ethical frameworks and transparency in tourism knowledge-based companies		
178	Promotion of responsible tourism through knowledge-based-oriented policymaking		
179	Collaboration of knowledge-based companies with different sectors to achieve tourism sustainability objectives		
180	Regular and transparent reporting by the knowledge-based company on tourism sustainability initiatives		

The findings presented in Table 3 indicate that 180 items (basic themes) were extracted from the qualitative data, and 36 organizing themes were conceptualized within nine overarching categories (global themes). In the next step, exploratory factor analysis (EFA) was employed to validate and establish the adequacy of the factor structure emerging from the qualitative phase. The results of this analysis, presented in Table 4, empirically confirm the construct validity and reliability of the measurement model.

Table 4. Exploratory Factor Analysis of the Model

Factor (Latent Structure)	Bartlett's Test	Factor Loading	Evaluation
Value Chain Architecture	0.000	> 0.65	Confirmed
Value Chain Policymaking	0.000	> 0.70	Confirmed
Interactive Regulation	0.000	> 0.60	Confirmed
Value-Oriented Culture	0.000	> 0.75	Confirmed
Information Integration	0.000	> 0.70	Confirmed
Communication Integration	0.000	> 0.68	Confirmed
Continuous Value Optimization	0.000	> 0.72	Confirmed
Value-Creation Dynamism	0.000	> 0.70	Confirmed
Sustainable Tourism Development	0.000	> 0.60	Confirmed

The results presented in Table 4 confirm the complete adequacy of data sampling for identifying the structural relationships within the model. As can be observed, the KMO index for all variables is at a highly satisfactory level (above 0.70), indicating an adequate sample size and sufficient correlations among the indicators associated with each factor. Furthermore, the results of Bartlett's test of sphericity for all variables confirm statistical significance at $\alpha < .05$ (Sig. = .000). Following confirmation of the structural validity of the themes and indicators through EFA, the next stage of the study involved construction of the model. Figure 1 presents the exploratory model derived from the study.

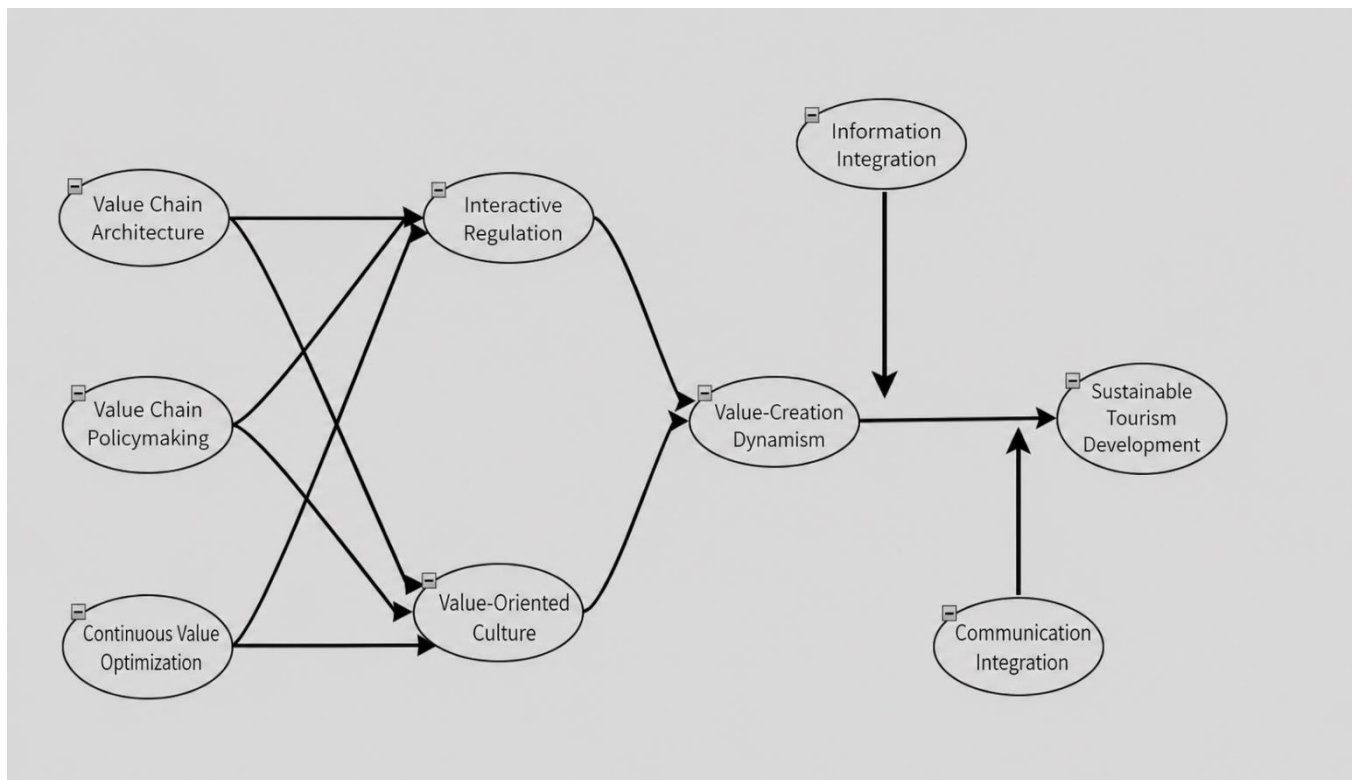


Figure 1. Exploratory Model Derived From the Study

The conceptual model presented in Figure 1 constitutes the final output of the thematic analysis process and thematic network formulation and represents the relationships among the nine global constructs of value chain governance across four distinct layers. The first layer comprises the drivers of the model: value chain architecture, value chain policymaking, and continuous value optimization. These constructs respectively refer to designing the configuration of actors and interorganizational linkages, formulating rules and strategic orientations, and progressively reviewing and continuously improving value-creating processes. According to the participants' accounts, these three constructs operate synergistically rather than independently and transmit their effects to the

body of the chain through two mediating mechanisms: interactive regulation, as a formal mechanism for coordination, resolution of conflicts of interest, and regulation of bargaining power among stakeholders; and value-oriented culture, as an informal and normative mechanism that institutionalizes trust, shared commitment, and adherence to collective value creation throughout the chain. The coexistence of these two mediating layers in the model indicates that effective governance of the tourism value chain cannot be achieved solely through structural regulation but also requires the simultaneous support of normative and cultural mechanisms. The third layer of the model centers on value-creation dynamism, which occupies the position of the focal theme and the point at which the various pathways converge. This construct reflects the chain's capacity for continuous reconfiguration of resources, renewal of business models, and agile responses to environmental changes. According to the thematic network, the effects of the foundational constructs can lead to the ultimate outcome only when they are manifested through this dynamism; in other words, value-creation dynamism constitutes the mediating link through which governance arrangements are translated into the operational capabilities of knowledge-based companies. Within the same layer, information integration and communication integration enter the model as facilitating and reinforcing conditions. The former strengthens the intensity and quality of value-creation dynamism by reducing information deficiencies and enhancing transparency, whereas the latter facilitates the transmission of this dynamism to the final outcome by integrating communication channels among governmental, private-sector, and knowledge-based actors. The fourth layer and ultimate outcome of the model is sustainable tourism development, in which the economic, social, and environmental achievements of the chain converge. Accordingly, the proposed model demonstrates that value chain governance in the tourism industry is a multilevel and multipath process that begins with structural foundations, passes through regulatory and cultural mechanisms, is strengthened within a context of information and communication integration, and ultimately manifests itself in sustainable tourism development.

Discussion and Conclusion

The present study was conducted to develop a qualitative model of value chain governance for the development of knowledge-based companies in the tourism industry. The findings yielded a multidimensional structure consisting of nine global themes: value chain architecture, value chain policymaking, interactive regulation, value-oriented culture, information integration, communication integration, continuous value optimization, value-creation dynamism, and sustainable tourism development. These themes were organized within a multilayered conceptual model in which value chain architecture, value chain policymaking, and continuous value optimization operate as major structural and strategic drivers; interactive regulation and value-oriented culture function as mediating governance mechanisms; value-creation dynamism represents the central capability through which governance arrangements are translated into organizational and market outcomes; and information integration and communication integration act as enabling conditions that strengthen this process. The ultimate outcome of the model is sustainable tourism development. This configuration indicates that the development of tourism knowledge-based companies cannot be attributed to a single institutional or organizational factor. Rather, it depends on the interaction of structural design, public policy, regulatory coordination, organizational culture, information flows, communication quality, continuous improvement, innovation capability, and sustainability-oriented outcomes.

The first major finding concerned **value chain architecture**, which included geographic scope, structural complexity, strength of interorganizational linkages, and structural flexibility. This result suggests that the configuration of actors and relationships within the tourism value chain fundamentally shapes the capacity of

knowledge-based firms to operate, innovate, and scale. Tourism services are rarely produced by a single organization; instead, they emerge through coordinated contributions from accommodation providers, transport systems, digital platforms, destination organizations, cultural institutions, technology suppliers, and governmental bodies. Therefore, the architecture of the chain determines whether knowledge, resources, risks, and opportunities can circulate effectively across organizational boundaries. This interpretation is consistent with tourism value-chain research emphasizing the importance of integrated actor networks and destination-level connectivity in generating coherent visitor experiences and economic value (3, 4). It also aligns with evidence showing that governance structures within value chains influence innovation performance because the position of firms, the intensity of relationships, and the degree of autonomy or dependence affect opportunities for learning and technological development (8). Moreover, research on global value chains has demonstrated that governance cannot be separated from the way actors are structurally positioned and linked, since ownership, dependence, and organizational configuration influence access to resources and strategic decision-making (9). The present findings extend these ideas to tourism knowledge-based companies by showing that flexibility and network breadth are particularly important in an industry characterized by seasonal fluctuations, market volatility, digital disruption, and changing patterns of tourist demand.

The second global theme, **value chain policymaking**, highlighted supportive and incentive policies, regulatory facilitation, infrastructure and ecosystem development, and human capital development. This finding demonstrates that the growth of knowledge-based tourism firms requires more than entrepreneurial initiative; it depends substantially on the institutional environment created by government and public-sector organizations. Financial facilities, tax and customs incentives, research and development grants, streamlined licensing, intellectual-property protection, digital infrastructure, science and technology parks, university–industry collaboration, and specialized workforce programs were all identified as important policy mechanisms. This result is consistent with research demonstrating that government policy plays a substantial role in tourism development through investment facilitation, economic incentives, and the creation of enabling institutional conditions (28). It is also supported by findings indicating that government support can enhance firm performance when it strengthens intellectual capital, knowledge management, innovation, and knowledge-sharing capabilities (19). Sectoral value-chain research similarly emphasizes that effective policy must address interdependencies across the entire chain rather than intervene only at isolated points (29). More broadly, the relationship between tourism and economic growth has been shown to depend on institutional quality and the capacity of public systems to support productive and coordinated tourism development (1, 2). Accordingly, the present findings suggest that tourism knowledge-based firms require a coherent policy ecosystem in which innovation policy, tourism policy, digital policy, and investment policy are aligned rather than fragmented.

A third important finding concerned **interactive regulation**, which encompassed formal coordination mechanisms, informal coordination mechanisms, conflict resolution, and risk and reward sharing. This theme indicates that governance in tourism value chains cannot rely exclusively on top-down regulation or contractual control. Effective governance requires negotiated coordination among actors whose interests, resources, and bargaining positions differ. Formal contracts, shared operational standards, joint committees, and regular meetings provide predictability and clarify responsibilities, while informal trust, goodwill, social networks, and personal relationships reduce relational uncertainty and facilitate adaptive problem-solving. This result is compatible with adaptive governance perspectives, which emphasize flexibility, distributed coordination, and the capacity to respond

collectively to external shocks (10). It also aligns with broader governance theory, which conceptualizes governance as a process involving networks of interdependent actors rather than merely hierarchical control by the state (6). Studies of global value chains further indicate that governance structures mediate unequal power relations and shape the allocation of responsibilities, risks, and benefits across chains (11). The present findings also support contemporary views of public governance in which institutional effectiveness depends on balancing public accountability with responsiveness, efficiency, and stakeholder engagement (27). Thus, interactive regulation in knowledge-based tourism can be understood as a hybrid governance mechanism combining formal institutional arrangements with relational coordination.

The identification of **value-oriented culture** as another major theme indicates that governance effectiveness depends not only on structures and rules but also on shared values. Innovation and creativity, customer and stakeholder orientation, collaboration and synergy, and continuous learning were the four central dimensions of this theme. Such findings are particularly meaningful in knowledge-based companies because innovation is inherently dependent on organizational norms that encourage experimentation, knowledge exchange, and constructive responses to failure. This interpretation is supported by knowledge-based theory, which emphasizes that competitive advantage arises from the creation, integration, and application of knowledge within and across organizations (14). Research on entrepreneurial orientation, stakeholder engagement, and knowledge-based resources similarly demonstrates that organizational performance improves when firms combine knowledge capabilities with proactive and collaborative relationships with stakeholders (16). Studies of knowledge employees also show that innovation depends on organizational climates that permit employees to express ideas and contribute specialist knowledge (17). Likewise, knowledge sharing and networking have been identified as essential mechanisms in knowledge-based value chains, particularly when firms require complementary expertise and technological resources (18). Therefore, the present study suggests that value-oriented culture functions as the normative infrastructure of governance, making formal arrangements more effective by reinforcing trust, learning, and collective commitment.

The fifth theme, **information integration**, consisted of information-system integration, information quality and accuracy, accessibility and sharing, and analytical utilization of information. This result indicates that knowledge-based tourism governance is increasingly inseparable from data governance. The tourism industry generates large volumes of fragmented information from reservations, transportation systems, tourist behavior, digital platforms, destination services, social media, payments, and smart technologies. Unless these data are interoperable, reliable, secure, and accessible to authorized actors, knowledge-based firms cannot effectively identify opportunities or coordinate strategic decisions. The importance of integrated information ecosystems in knowledge-based companies has been documented in research showing that open-data management and innovative information flows can strengthen organizational connectivity and the use of knowledge resources (23). The present findings also align with data-governance literature stressing the necessity of explicit mechanisms for data quality, access, ownership, security, and strategic use (24). Furthermore, technological platform governance illustrates that control over information infrastructures and intellectual property can influence power relationships throughout value chains (25). The growing use of advanced computational tools further strengthens the strategic importance of integrated data environments because sophisticated analytical technologies depend on reliable and well-structured data inputs (22). Therefore, information integration should be regarded as both a technological and governance capability.

Closely related to this finding was the theme of **communication integration**, which included diversity of communication channels, frequency and timeliness, communication quality and effectiveness, and communication governance. The results suggest that technological connectivity alone is insufficient if actors cannot communicate in a clear, timely, coordinated, and mutually comprehensible manner. In complex tourism networks, delays and misunderstandings between public agencies, technology firms, tourism service providers, and other stakeholders can disrupt service quality and reduce the benefits of information integration. This interpretation is consistent with the view that governance in digital environments increasingly depends on nodal positions and communication networks through which institutions influence and coordinate collective action (7). It also corresponds with strategic planning research showing that implementation problems frequently arise from weak interorganizational coordination, fragmented communication, and limited stakeholder alignment rather than from deficiencies in formal plans alone (26). Furthermore, the electronic transformation of tourism value chains has made customer-centered and digitally integrated communication central to the creation of tourism value (20). The findings therefore imply that communication integration forms the relational infrastructure through which data, decisions, expectations, and feedback move across the chain.

Another important global theme was **continuous value optimization**, encompassing continuous process improvement, improvement of service and product quality, reduction of waste and inefficiency, and increased workforce productivity. This theme reflects the need for knowledge-based tourism firms to continuously refine how they transform knowledge, technology, and resources into customer value. The emphasis on agility, reduced cycle times, lower operating costs, quality standards, and elimination of non-value-adding activities indicates that value chain governance should support learning-oriented operational improvement rather than merely coordinate existing activities. This finding is consistent with studies demonstrating that knowledge transfer and organizational innovation can strengthen quality and environmental management in knowledge-based firms (30). It also aligns with research on agile environments indicating that knowledge-based resources enhance responsiveness, adaptive coordination, and the capacity for continuous development (31). Evidence from Industry 4.0 and circular-economy contexts further demonstrates that technology produces sustainable operational gains when embedded in effective project-management and supply-chain coordination processes (32). The present findings therefore suggest that optimization should be conceptualized as an ongoing governance function through which the chain continuously identifies inefficiencies and reallocates resources toward higher-value activities.

The central role assigned to **value-creation dynamism** represents one of the most significant findings of the study. This theme included innovation speed, quality and differentiation of innovation, adaptation to changing market needs, and market-share growth. In the conceptual model, value-creation dynamism acts as the primary mechanism through which governance arrangements are translated into tangible developmental outcomes. This implies that supportive policies, effective chain structures, strong cultural values, and integrated information systems have limited developmental significance unless they enhance firms' capacity to innovate, reconfigure resources, commercialize new ideas, and respond to changing tourist preferences. This result is consistent with knowledge-based and resource-based perspectives emphasizing dynamic use of knowledge assets as a source of competitive advantage (14). It also aligns with research showing that innovation is shaped by value-chain governance arrangements because governance influences knowledge access, incentives, autonomy, and learning opportunities (8). Research on micro and knowledge-intensive firms likewise demonstrates that business development depends on transforming acquired knowledge into new products, services, and strategic capabilities (15). The increasingly

phygital nature of service ecosystems further supports this interpretation because tourism firms must continually integrate physical and digital experiences to remain competitive (21). Accordingly, value-creation dynamism can be regarded as the operational expression of successful governance.

The ultimate outcome identified in the model was **sustainable tourism development**, encompassing environmental, sociocultural, economic, and ethics-oriented sustainability. This finding is particularly important because it positions sustainability not as an external constraint but as the final value outcome of effective governance. Environmental sustainability was associated with carbon reduction, resource efficiency, recycling, biodiversity conservation, and green technologies; social and cultural sustainability involved local benefit distribution, heritage preservation, social responsibility, and mitigation of adverse tourism impacts; economic sustainability concerned employment, equitable benefit distribution, product diversification, and responsible investment; and ethical sustainability involved transparency, responsible tourism, cross-sector collaboration, and sustainability reporting. These findings are consistent with sustainable supply-chain governance literature emphasizing the need to combine environmental, social, and economic responsibilities within governance systems (39). They also align with recent regulatory developments that increasingly impose human-rights and environmental due-diligence responsibilities throughout global supply chains (12, 13). Research integrating stakeholder theory, global value-chain theory, and resource-dependence theory further shows that sustainability strategies depend on relationships among stakeholders, resource dependencies, and governance configurations (36). Similarly, technological innovation in knowledge-based economies has been linked with green growth and improved environmental performance (33, 34). The model developed in this study therefore supports a view of sustainable tourism development as the cumulative consequence of coordinated governance, innovation capability, information integration, stakeholder collaboration, and continuous value improvement.

The overall configuration of the model is also consistent with research demonstrating that sustainable value chains increasingly require both institutional and technological mechanisms. Studies of global industries show that sustainability and competitiveness are influenced by governance structures that determine participation, resource dependence, responsibility, and the distribution of value (36, 37). At the same time, technologies such as blockchain illustrate how transparency, verification, and coordination mechanisms can become embedded in digital systems and potentially reduce certain transaction and governance costs (38). These developments are especially relevant to knowledge-based tourism companies, which often operate through digital platforms and therefore depend on technologically mediated trust and coordination. The present model integrates these considerations by locating information and communication integration alongside interactive regulation and value-oriented culture. In this respect, the findings suggest that successful value-chain governance is neither exclusively technological nor exclusively institutional; it is produced through the interaction of technological infrastructures, organizational capabilities, public policies, and relational mechanisms.

Taken together, the findings indicate that governance of tourism knowledge-based companies should be understood as a multilayered and dynamic system rather than as a set of isolated policy instruments. The model shows that value chain architecture, policymaking, and continuous optimization establish the foundational conditions for development; interactive regulation and value-oriented culture shape the quality of coordination among actors; information and communication integration facilitate the circulation and use of knowledge; and value-creation dynamism converts these governance conditions into innovative and adaptive capabilities. These processes ultimately contribute to sustainable tourism development. This integrated interpretation helps address

the fragmentation observed in previous tourism value-chain research, which has often examined customer experiences, electronic tourism systems, institutional arrangements, or economic outcomes separately (4, 5, 20). By integrating these components into a unified governance framework, the present study offers a more comprehensive explanation of how knowledge-based firms can develop within the tourism ecosystem.

The present study has several limitations that should be considered when interpreting its findings. First, because the research employed a qualitative design and relied on purposive sampling, the results reflect the interpretations and professional experiences of a relatively limited group of experts and should not be generalized statistically to all tourism knowledge-based companies or national contexts. Second, although theoretical saturation was achieved and additional confirmatory interviews were conducted, the number and composition of participants may still have influenced the range of themes identified. Third, the study relied primarily on interview data, which may be affected by recall bias, professional position, organizational interests, and participants' subjective interpretations of governance practices. Fourth, although coding reliability and several qualitative validity strategies were employed, interpretation remains an inherent component of thematic analysis. Fifth, the model integrates a broad set of dimensions and relationships, but the qualitative phase cannot establish the magnitude, direction, or causal strength of the relationships among constructs. Finally, the tourism industry is highly sensitive to technological, regulatory, economic, and geopolitical change; consequently, the relative importance of particular governance mechanisms may evolve over time and across destinations.

Future research should quantitatively test the proposed model using larger and more heterogeneous samples of tourism knowledge-based companies, managers, policymakers, and other value-chain actors. Confirmatory factor analysis and structural equation modeling could be used to examine the measurement properties of the identified constructs and test direct, indirect, mediating, and moderating relationships among them. Comparative research across countries, regions, destination types, and tourism subsectors would also be valuable for determining whether the governance structure identified in this study is context-dependent or transferable across different institutional environments. Longitudinal studies could investigate how governance arrangements change during different stages of firm development and in response to technological disruption, crises, or regulatory reforms. Future studies could also examine individual components of the model in greater depth, particularly the mechanisms through which information integration, communication integration, and value-oriented culture affect value-creation dynamism. Multi-level research incorporating firm-, network-, destination-, and policy-level data may provide a more precise account of cross-level interactions. In addition, mixed-method designs could combine qualitative insights with network analysis, performance indicators, platform data, and stakeholder surveys to produce stronger empirical validation of the proposed model.

From a practical perspective, policymakers and tourism authorities should adopt a value-chain approach when designing programs for the development of knowledge-based tourism companies rather than implementing fragmented support measures. Regulatory procedures should be simplified and made more predictable, while financial incentives, innovation grants, intellectual-property protection, digital infrastructure, data-sharing platforms, and specialized workforce-development programs should be coordinated within a unified policy framework. Tourism knowledge-based companies should actively develop long-term relationships with other value-chain actors, establish transparent contracts and shared standards, create mechanisms for joint problem-solving, and encourage equitable sharing of risks and rewards. Managers should also invest in interoperable information systems, data quality, cybersecurity, analytics, and communication protocols so that timely and reliable information can circulate

across the network. Internally, firms should cultivate a culture that rewards innovation, employee learning, experimentation, stakeholder orientation, and collaboration. Continuous process improvement should be institutionalized through systematic assessment of service quality, costs, resource efficiency, workforce productivity, and non-value-adding activities. Finally, sustainability should be incorporated into strategic and operational decision-making from the outset so that economic growth, technological innovation, environmental responsibility, local-community benefits, cultural preservation, and ethical accountability develop simultaneously rather than being treated as competing objectives.

Acknowledgments

We would like to express our appreciation and gratitude to all those who helped us carrying out this study.

Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

All ethical principles were adhered in conducting and writing this article.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

Funding

This research was carried out independently with personal funding and without the financial support of any governmental or private institution or organization.

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