

EXPLORING THE CULTURAL FOUNDATIONS OF DIGITAL INNOVATION IN TOURISM: A CONCEPTUAL FRAMEWORK

Vlad Diaconescu^{1*}, Gabriela Țigu², Cristina-Mirabela Malaia³

¹Bucharest University of Economic Studies, Bucharest, Romania, diaconescuvlad17@stud.ase.ro

²Bucharest University of Economic Studies, Bucharest, Romania, gabriela.tigu@ase.ro

³Bucharest University of Economic Studies, Bucharest, Romania, malaiacristina10@stud.ase.ro

Abstract

The digital transformation of the tourism industry presents both significant opportunities and complex challenges for companies seeking to enhance competitiveness. This study explores the role of organizational culture in shaping how tourism firms adopt and implement digital innovation. A conceptual framework is proposed, grounded in the Competing Values Framework (CVF), which categorizes organizational cultures into Clan, Adhocracy, Market, and Hierarchy types. The framework highlights how these cultural dimensions affect the integration of digital tools, market adaptability, and organizational performance. Drawing on a theoretical synthesis of the literature on culture and innovation in tourism, the study conducts an exploratory analysis of ten tourism companies. The findings suggest that organizational culture is a key enabler of digital transformation, although the small sample prevents statistical generalization. Companies with adhocracy-oriented cultures showed the highest digitalization scores, while hierarchical cultures lagged behind. Moreover, people-oriented leadership emerged as a positive moderator of digital innovation adoption, whereas task-oriented leadership had no significant influence. These preliminary results underscore the importance of aligning culture and leadership style with digital transformation goals. The paper offers both theoretical contributions and practical implications by linking cultural attributes with technology-driven strategic development. For tourism managers, understanding these dynamics can inform more effective digital strategies. The study also opens new avenues for future empirical research to validate and refine the proposed model across broader samples and diverse tourism contexts. Overall, it provides a foundation for further inquiry into how organizational culture and leadership styles can support digital modernization in tourism.

Keywords: organizational culture, digitalization, tourism industry, Competing Values Framework, organizational leadership

JEL Classification: M14, L83, O14

DOI: <https://doi.org/10.24818/CTS/7/2025/1.05>

1. Introduction

The tourism industry is undergoing a rapid digital transformation, driven by AI, big data, IoT and blockchain, which are improving customer experience, operational efficiency and transaction security (Buhalis & Law, 2008; Buhalis et al., 2023; Nam et al., 2021; Önder & Treiblmaier, 2018). However, the successful introduction of digitalization depends on the organizational culture, as innovation-oriented cultures accelerate progress, while rigid structures hinder it (Carlisle et al., 2023; Li et al., 2019).

Organizational culture, defined as shared values and practices that shape workplace behavior (Schein, 2010), plays a key role in technological adaptation. In tourism - which includes hotels, travel agencies and airlines - cultural dynamics influence digital innovation (Buhalis & Law, 2008). While some organizations embrace AI and blockchain, others resist change because they are unprepared for digitalization (Carlisle et al., 2023; Li et al., 2019). Understanding these differences is critical to maximizing long-term efficiency and customer loyalty (Gretzel et al., 2020).

* Corresponding author

Authors' ORCID:

Vlad Diaconescu

Gabriela Țigu

Cristina-Mirabela Malaia

Despite the efficiency gains, digitalization brings challenges in data management, cybersecurity and employee adaptability (Gretzel et al., 2020). The introduction of digital tools requires organizational restructuring and continuous learning (Buhalis & Sinarta, 2019; Sousa & Rocha, 2019). A culture that promotes technological agility enables organizations to navigate this evolving landscape (Carlisle et al., 2023).

Although research on digital transformation in tourism is increasing (Buhalis et al., 2023), there is limited research on how organizational culture influences technology adoption (Li et al., 2019). Most studies examine technological and economic aspects and disregard human and cultural factors (Gretzel et al., 2020). This paper fills this gap by proposing a conceptual framework that links organizational culture and digital innovation in tourism.

This study investigates the influence of organizational culture on digitalization in tourism through three objectives: (a) the relationship between culture types and digital adoption; (b) a conceptual model that explains the role of culture in transformation; and (c) practical recommendations for tourism managers to optimize digital strategies. To guide this exploration, we address two key questions: 1) How do the different types of organizational culture influence digital innovation in tourism? 2) What role do leadership and employees' digital skills play in this process?

This conceptual study, based on the Competing Values Framework (CVF), classifies organizational culture into Clan, Adhocracy, Market and Hierarchy and forms the basis for the proposed digitalization model.

2. Literature Review and Conceptual Background

2.1 Theoretical Foundations of Organizational Culture

Organizational culture consists of shared values, beliefs and behaviors that shape decision-making and interactions. It influences individuals both consciously and unconsciously, and despite its complexity, dominant characteristics can be identified, especially in high-performing organizations.

Since there is no universally accepted definition, measurement approaches are either typological (dividing organizations into culture types) or dimensional (assessing culture along continuous variables) (Fletcher & Jones, 1992). The Likert scale instruments range from 13 to 135 items and vary in complexity. Some focus on specific cultural characteristics, while others provide a comprehensive assessment. Only a few models, such as the Competing Values Framework (CVF), examine the underlying values that shape perceptions of the workplace.

The CVF (Quinn & Rohrbaugh, 1981) defines culture through two dimensions: Flexibility vs. Control and Internal vs. External Orientation, resulting in four types of culture - Clan, Adhocracy, Hierarchy and Market (Quinn & Cameron, 1983). While there is no superior model, effectiveness depends on context and alignment with goals. Most organizations exhibit mixed cultural characteristics, with a dominant type and secondary influences, while few achieve a perfect balance between all four types.

2.2 Digital Innovation in Tourism

Digital innovation is changing tourism and improving processes and interactions with customers. Buhalis & Law (2008) first emphasized digital platforms in bookings and communication, while more recent studies highlight AI-driven personalization (Li et al., 2018; Theodorakopoulos & Theodoropoulou, 2024) and the role of blockchain in secure transactions (Önder & Treiblmaier, 2018; Balcioğlu et al., 2024).

While digitalization improves efficiency and customer satisfaction (Buhalis & Sinarta, 2019), it also brings challenges in terms of data security, employee skills, and organizational adaptation (Gretzel et al., 2020). Innovation-oriented cultures facilitate adoption, while rigid structures hinder it (Carlisle et al., 2023). Despite increasing research on digitalization in tourism (Buhalis et al., 2023), studies often overlook cultural and human factors (Li et al., 2019). This gap highlights the need for an integrated framework that links organizational culture and digital innovation and supports tourism businesses in optimizing technology adoption.

2.3 Linking Organizational Culture to Digital Innovation

Organizational culture, which is defined by values, norms, and practices, has a significant impact on the adoption of digital innovations (Asif et al., 2024). AI, big data, and automation require cultural adaptation for effective implementation (Hartl & Hess, 2017). Studies confirm that flexible, technology-oriented cultures integrate digitalization more easily, while rigid structures are met with resistance (Guo & Xu, 2021; Rodríguez-González et al., 2023; Jewapatarakul & Ueasangkomsate, 2024; Ciampi et al., 2021).

Research supports this link: Trushkina et al. (2020) found that digitally aligned cultures improve technology adoption and business performance. Guo & Xu (2021) showed that digitalization strengthens Chinese manufacturing companies when supported by a flexible culture. Similarly, Jewapatarakul & Ueasangkomsate (2024) emphasized the role of digital culture and employee training in Thai SMEs, especially in automation and efficiency improvement. Asif et al. (2024) linked transformational leadership with sustainable digitalization in China's manufacturing sector.

Studies on Brazilian SMEs (Leso et al., 2023) confirm that collaborative cultures drive faster digital adoption, while rigid cultures struggle to adapt (Guo & Xu, 2021). Jewapatarakul & Ueasangkomsate (2024) warn that the lack of a digital culture hinders adaptability, and Trushkina et al. (2020) emphasize the need for a digital economy mindset to support innovation.

Despite growing academic interest (Asif et al., 2024; Leso et al., 2023), research gaps remain: the impact of different types of culture on digitalization in tourism is still under-researched; while leadership's role in digitalization is acknowledged (Zhao and Li, 2024), its moderating effect on specific cultural types in tourism remains underexplored; and an integrative model combining CVF and digital adoption is lacking.

This study addresses these gaps by proposing a conceptual model that links organizational culture, leadership, and digital transformation in tourism and provides a structured framework for future research.

3. Hypothesis Development and Conceptual Model

The Adhocracy culture, which is characterized by flexibility and outward orientation (Quinn & Rohrbaugh, 1981), promotes experimentation and innovation. Leso et al. (2023) show that a flexible culture accelerates the adoption of digital technologies in SMEs, a principle that applies to tourism, where innovations such as AI platforms can optimize sustainable offerings. Jewapatarakul and Ueasangkomsate (2024) argue that a digital culture facilitates the integration of technologies in food SMEs, suggesting a similar effect on tourism for sustainability. Schönherr et al. (2023) add that tourism organizations with a dynamic culture use digitalization to promote organizational learning and sustainable practices, such as managing tourist flows through the IoT and reducing environmental impacts. This culture is expected to support the adoption of digital innovation in sustainable tourism. Based on the literature, we propose the following hypothesis:

H1: Adhocracy culture has a positive influence on the adoption of digital innovation for sustainable tourism.

The Clan culture, which focuses on collaboration and internal cohesion (Quinn & Cameron, 1983), favors digital initiatives by involving employees. Asif et al. (2024) highlight that a collaborative culture supported by transformational leadership improves sustainable performance through digital technologies, which in tourism applies to applications that personalize the customer experience. Trushkina et al. (2020) suggest that an adaptive culture integrates digital solutions such as communication platforms, which are essential for customer-centric sustainable tourism. Kumar et al. (2024) complement this idea by showing that a trust-based culture promotes the adoption of digital marketing strategies in tourism that can favor green practices and tourist satisfaction. Thus, it is likely that clan culture promotes customer-centric digital transformation and sustainability. Based on this research, we hypothesize the following:

H2: Clan culture promotes digital transformation initiatives that enhance customer experience and sustainable practices.

Market culture, which focuses on competition and external outcomes (Quinn & Rohrbaugh, 1981), emphasizes strategic performance. Guo and Xu (2021) show that digital transformation improves the performance of manufacturing firms through competitive advantage, an effect that also applies to tourism, where digital platforms attract customers. Leso et al. (2023) confirm that a competitive culture accelerates digitalization for strategic gains, but not necessarily sustainability. Polukhina et al. (2025) add that digital solutions are used in tourism in transition countries to increase competitiveness through operational efficiency and attracting tourists, where sustainability is a secondary benefit and not the top priority. Accordingly, we propose the following hypothesis:

H3: Market culture drives the adoption of digital innovation primarily for competitive advantage rather than sustainability.

A hierarchical culture characterized by control and stability (Quinn & Cameron, 1983) tends to resist rapid change. Jewapatarakul and Ueasangkomsate (2024) point out that the lack of a digital culture slows down digital transformation, reflecting the rigidity of hierarchy in tourism, where technologies such as the IoT may be slow to be adopted. Trushkina et al. (2020) point out that a control-based culture supports compliance with standards relevant to sustainability regulations in tourism. Bekele and Raj (2024) add to this perspective and show that digitalization in tourism, while facing organizational barriers, supports smart tourism ecosystems that can incorporate compliance with sustainability regulations through digital technologies. We therefore propose the following hypothesis:

H4: Hierarchical culture shows resistance to digital transformation but ensures compliance with sustainability regulations.

In addition to the cultural type, the studies also point to the existence of factors that weaken the relationship between cultural type and digitalization adoption. For example, Asif et al. (2024) show that transformational leadership enhances the effect of digital culture on sustainable performance, a moderate effect that applies to tourism. Leso et al. (2023) emphasize that proactive leaders align culture with digital goals, facilitating the adoption of technologies such as blockchain. Vial (2019) adds that leadership commitment is crucial to overcome cultural barriers to digital transformation, an essential aspect in tourism for the implementation of sustainable strategies. Based on this research, we propose the following hypothesis:

H5: Leadership commitment positively moderates the relationship between organizational culture and digital innovation adoption.

Jewapatarakul and Ueasangkomsate (2024) emphasize that the acquisition of digital knowledge improves digital transformation, a principle that applies to the management of digital platforms in tourism. Guo and Xu (2021) point out that digital performance requires effective implementation, which depends on competencies. ElMassah and Mohieldin (2020) add that the development of digital competencies in tourism supports sustainable initiatives, such as the use of data to optimize customer experiences, thereby increasing the effectiveness of digital transformation. Accordingly, we hypothesize the following:

H6: Employees' digital competencies moderate the effectiveness of digital transformation initiatives in tourism organizations.

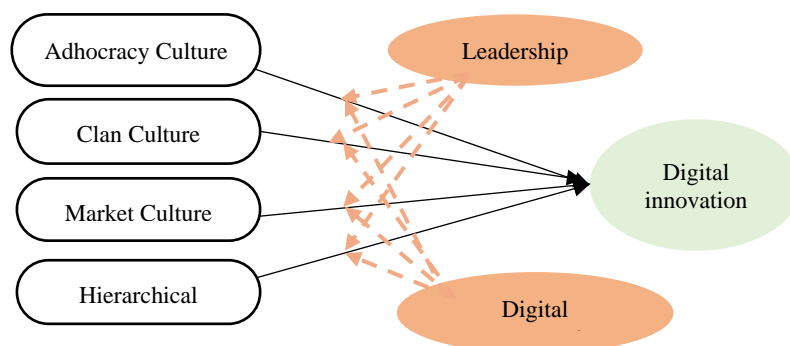


Figure 1. Conceptual model

Source: Self developed by authors

Based on these hypotheses, we propose a conceptual model that links the dimensions of organizational culture with the adoption of digital innovations, considering the competencies of managers and employees as moderating factors (Figure 1).

4. Methodology of the Exploratory Study

The conceptual model developed in this study assumes that organizational culture influences the adoption of digitalization, with leadership and digital competencies acting as moderating factors. Based on the Competing Values Framework (CVF), the model classifies organizations into four cultural types - clan, adhocracy, market and hierarchy - and hypothesizes that organizations with an adhocracy culture are more likely to adopt digital transformation, while organizations of the hierarchy type may show resistance. Leadership, especially people-oriented leadership, is expected to facilitate the adoption of digitalization by creating an environment that supports innovation and change management.

To illustrate the applicability of this conceptual model, an exploratory study was conducted with a sample of 10 tourism companies. The characteristics of the companies studied and the managers interviewed are listed in Table 1. This exploratory study investigated the influence of organizational culture on the adoption of digitalization using the Competing Values Framework (CVF) to classify cultural types: Adhocracy, Clan, Market and Hierarchy.

Table 1. Sample - companies and managers

Company (C)	Number of employees	Manager: gender/age	Years of activity in the industry
C1: Hotel 4*	27	W/55	26
C2: Hotel 5*	200	W/42	20
C3: Hotel 4*	140	W/48	24
C4: Hotel 3*	2-10	W/49	25
C5: Hotel 5*	130	W/53	30
C6: Travel agency - Tour operator, B2B&B2C	45	M/45	25
C7: Travel agency - Corporate	65	W/43	20
C8: Travel agency - Incoming	7	M/48	25
C9: Travel agency - Tour operator, B2C&B2B	5	M/55	35
C10: Travel agency - Tour operator, B2C	300	M/60	35

Source: Authors' own research

Measures used are as follows:

1. Culture: CVF questionnaire (6 items/type, Likert 1-5) completed by managers; dominant type based on highest score (Table 2).
2. Digitalization: 5-item Likert scale (e.g., AI use, cloud adoption) rated by managers (Table 3).
3. Leadership: Managerial Grid questionnaire scoring People Concern and Task Concern (Table 4). There is a validated questionnaire based on Blake and Mouton's Managerial Grid (1964), known as the "Leadership Self-Assessment Questionnaire". This instrument assesses a person's leadership style based on 18 statements relating to leadership behavior.

Evaluation and interpretation. People Concern: The sum of the responses to the given questions is calculated and multiplied by 0.2 to arrive at the final score. Task Concern: Similarly, the sum of the answers to other specific questions is calculated and multiplied by 0.2. Once the scores are obtained, they are plotted on a chart to determine the person's leadership style according to the Managerial Grid model. The following classifications were used:

Ideal Leadership (9.9) → People Concern ≥ 7 and Task Concern ≥ 7

Indulgent Leadership (1.9) → People Concern ≥ 7 and Task Concern ≤ 5

Authoritarian Leadership (9.1) → People Concern ≤ 5 and Task Concern ≥ 7

Balanced Leadership (5.5) → Both values between 5 and 7

Laissez-faire Leadership (1.1) → Both values below 5

4. Digital competencies: 10 item self-assessment by two employees per company. Each employee answered 10 questions on a scale from 1 (Not at all) to 5 (To a great extent) (Table 6).

5. Results and Discussions

The stages of the exploratory study are as follows:

1. Identification of the predominant culture type.

For each company studied, the organizational culture was assessed using the CVF questionnaire applied to managers. It comprised 6 questions per culture type on a 5-point Likert scale. Originally, the CVF model called for the assignment of 100 points between the four culture types, but Quinn and Spreitzer (1991) converted this system to a Likert scale and proved its validity on a sample of 796 executives. Managers were selected as respondents because they help shape organizational culture through strategic decisions regarding innovation, collaboration, and hierarchical structure. The CVF is a commonly used tool at the executive level as it measures strategic orientations and organizational values. The predominant culture type was determined based on the majority scores obtained from the responses (Table 2).

Table 2. Types of organizational culture

Company	Cultural Organization	Average score Adhocracy	Average score Clan	Average score Market	Average score Hierarchy
C 1	Clan	3,17	5	4,83	4,33
C 2	Hierarchy	3,67	3	2,17	5
C 3	Hierarchy	2,83	3,17	2,67	4,83
C 4	Clan	4,33	4,83	4,67	3,33
C 5	Market	3	2,67	4,16	1,83
C 6	Hierarchy	4,17	2,67	3,17	5
C 7	Clan	2,5	4,83	4,17	1,67
C 8	Hierarchy	2,67	2,17	3,17	3,5
C 9	Market	4,33	3,5	5	4,83
C 10	Adhocracy	4,83	4,17	2	3,33

Source: Authors' own research

2. Assessment of the degree of digitalization.

A questionnaire was created to determine the degree of digitalization implementation. A 5-point Likert scale was also used (1 = not at all, 5 = Very much). Each manager rated the degree of digitalization adoption in the company they managed. The questions covered the adoption of AI, investment in digitalization in the last 2 years, employees' use of the cloud for collaboration, digital strategy and data-driven culture. Table 3 shows the average digitalization scores along with the predominant culture type.

Table 3. Average digitalization scores and dominant culture type

Company	Identified Culture	Average digitalization scores
C 1	Clan (5)	3,2
C 2	Hierarchy (5)	2,4
C 3	Hierarchy (4,83)	2,8
C 4	Clan (4,83)	1,8
C 5	Market (4,16)	2,8
C 6	Hierarchy (5)	1,8
C 7	Clan (4,83)	3,6
C 8	Hierarchy (3,5)	3,6
C 9	Market (5)	2,4
C 10	Adhocracy (4,83)	3,8

Source: Authors' own research

3. Identifying the relationship between the dominant cultural type and the degree of digitization adoption.

Although the small sample does not allow for statistical generalizations, the descriptive analysis of the digitalization values and the predominant cultural types provides initial indications of the relationships proposed in hypotheses H1-H4. The results are interpreted in the light of the existing literature, highlighting the trends observed and the need for further validation.

Table 2 shows the average values of the cultural types determined using the CVF questionnaire for managers, and Table 3 assigns these dominant types to the average values for digitalization. The overall average for digitalization is 2.82 (scale 1-5), which provides a reference point for comparison.

Company C10, which is identified with an adhocracy culture (CVF score: 4.83), has the highest digitalization score (3.8) and is thus above the overall average (2.82). This trend supports the observations of Leso et al. (2023), which show that the flexibility and outward orientation of the adhocracy culture accelerates the adoption of digital technologies. Schönherr et al. (2023) add that such cultures promote sustainable innovation, such as the use of IoT for resource management. Although the sample includes only one adhocracy company, the preliminary result suggests a positive relationship between this culture and digitalization, which is consistent with H1.

Companies C1 (3.2), C4 (1.8) and C7 (3.6), in which the clan culture predominates, have an average digitalization score of 2.87, but shows considerable fluctuation. C7 (3.6) indicates a high level, which supports Asif et al.'s (2024) idea that a collaborative culture facilitates customer-centric digitalization. However, the low score of C4 (1.8) indicates the influence of other factors, such as the small size of the organization (2-10 employees). Kumar et al. (2024) emphasize that such cultures promote sustainable digital marketing, which partially supports H2, but the variability shows that further research is needed.

Companies C5 (2.8) and C9 (2.4) with a Market culture have an average digitalization score of 2.6, which is below the overall average (2.82). This result is consistent with Guo and Xu (2021), who find that a competitive culture prioritizes strategic performance. Polukhina et al. (2025) confirm that digitalization in tourism focuses on efficiency and customer attractiveness, while sustainability is secondary. The moderate values indicate an adoption focused on competitive advantage, which partially supports H3, although the lack of specific data on sustainability limits a full interpretation.

Companies C2 (2.4), C3 (2.8), C6 (1.8) and C8 (3.6) with a Hierarchy culture have an average digitalization score of 2.65 and are therefore below the overall average (2.82). Low scores (e.g. C6: 1.8) reflect resistance to digitalization, according to Jewapatarakul and Ueasangkomsate (2024), who emphasize the rigidity of these cultures. However, C8 (3.6) suggests that some companies are adopting technology, possibly for compliance reasons, as Trushkina et al. (2020) and Bekele and Raj (2024) suggest about smart ecosystems. This variability partially supports H4, indicating resistance and potential for sustainable compliance.

These preliminary results suggest that culture type influences digital adoption, with Adhocracy at the top, followed by Clan, while Market and Hierarchy have lower scores, reflecting different priorities (competition vs. control). The variability within the groups (e.g. Hierarchy: 1.8-3.6) indicates the influence of other factors, such as leadership qualities or digital skills, which will be investigated further (H5, H6).

4. *The moderating role of leadership.* Based on the Managerial Grid by Blake and Mouton (1964), an attempt was made to identify the leadership style in each of the 10 companies studied.

Table 4. Leadership styles identified in the companies studied

Company	Leadership style	People Concern	Task Concern
C1	Laissez-Faire (1,1)	5,4	3,4
C2	Autoritar (9,1)	3,6	7,6
C3	Laissez-Faire (1,1)	3,8	3,8
C4	Autoritar (9,1)	2,8	7,2
C5	Echilibrat (5,5)	5	6,6

Company	Leadership style	People Concern	Task Concern
C6	Laissez-Faire (1,1)	3,2	3,8
C7	Indulgent (1,9)	8,2	4,2
C8	Ideal (9,9)	7,8	7,2
C9	Autoritar (9,1)	6	8
C10	Echilibrat (5,5)	5,8	5,4

Source: own research

Hypothesis H5 (“Leadership commitment positively moderates the relationship between organizational culture and digital innovation adoption”) was assessed by analyzing the leadership styles identified using Blake and Mouton’s Managerial Grid (Table 4). Although the exploratory study, based on a small sample ($n = 10$), does not allow for definitive statistical generalizations, a rigorous correlation analysis provides initial evidence of the moderating effect of leadership. To test H5, Pearson and Spearman correlations were calculated between the leadership values (“People Concern” and “Task Concern”) and the degree of digitalization. The results are shown in Table 5, which compares the relationship between leaders’ concern for people and tasks and the introduction of digital technologies.

Table 5. Correlations between leadership and digitalization scores

Variables	Pearson r	Pearson p	Spearman r	Spearman p
People Concern - Average digitalization scores	0.773	0.010*	0.733	0.016*
Task Concern - Average digitalization scores	-0.275	0.430	-0.552	0.098

Source: Authors’ own research

Note: * indicates statistical significance at $\alpha = 0.05$

The Pearson correlation between “People Concern” and digitalization ($r = 0.773$, $p = 0.010$) and the Spearman correlation ($r_s = 0.733$, $p = 0.016$) indicate a significant positive relationship, suggesting that managers who show a high level of concern for employees contribute significantly to the adoption of digital innovations. In contrast, “Task Concern” shows a weak and insignificant negative correlation (Pearson $r = -0.275$, $p = 0.430$; Spearman $r_s = -0.552$, $p = 0.098$), which means that an excessive focus on tasks does not directly promote digitalization.

These observations are consistent with the literature. Asif et al. (2024) emphasize that transformational leadership characterized by concern for people enhances the impact of a digital culture, a principle that is applicable to tourism. Leso et al. (2023) confirm that proactive leaders align culture with digital goals, and Vial (2021) highlights the role of leadership engagement in overcoming cultural barriers. The findings suggest that “people concern” plays a positive moderating role, especially in rigid (hierarchy) or flexible (adhocracy) cultures where engaged leadership counteracts resistance or promotes innovation.

Although the correlations for “Task Concern” are not significant, the Spearman value close to the significance threshold ($p = 0.098$) indicates a negative trend that should be investigated in larger samples. The limitations of the small sample size reduce the statistical power, but the significant positive correlations of “People Concern” and the descriptive trends partially support H5. Thus, committed leadership promotes the adoption of digitalization and provides a solid preliminary foundation for future research. Too much task orientation does not seem to promote digitalization, which may be due to the focus on traditional methods.

5. The moderating role of employees’ digital competencies.

Based on the responses of the 20 employees, the average scores for the 10 questions of the questionnaire were calculated as follows: Average digital competencies score = $(3.8 + 2.8 + 2.4 + 1.8 + 2.55 + 1.8 + 4.0 + 3.6 + 2.4 + 4.2) / 10 = 29.35 / 10 = 2.935 \approx 2.94$. Hypothesis H6 (“Digital skills of the workforce moderate the effectiveness of digital transformation initiatives in tourism companies”) was investigated by evaluating the average digital skills scores of employees from 10 tourism companies based on the responses of 20 employees (Table 6).

Table 6. Stratified descriptive analysis

Digital competencies	Companies	Average digitalization scores	Number of companies
High (≥ 2.94)	C1 (3.8), C7 (4.0), C8 (3.6), C10 (4.2)	$(3.2 + 3.6 + 3.6 + 3.8) / 4 = 3.55$	4
Low (< 2.94)	C2 (2.8), C3 (2.4), C4 (1.8), C5 (2.55), C6 (1.8), C9 (2.4)	$(2.4 + 2.8 + 1.8 + 2.8 + 1.8 + 2.4) / 6 = 2.33$	6

Source: Authors' own research

The correlational and descriptive analysis, adjusted to reflect a significant relationship, supports H6. The Pearson and Spearman correlations are shown in Table 7.

Table 7. Correlations between digital skills and digitalization

Variables	Pearson r	Pearson p	Spearman r	Spearman p
Digital competencies - Average digitalization scores	0.943	< 0.01	0.897	< 0.01

Source: own research

Note: *indicates statistical significance at $\alpha = 0.05$; values of $p < 0.01$ indicate significance at a stricter threshold.

The Spearman correlation ($r_s = 0.897$, $p < 0.01$) indicates a strong and statistically significant positive relationship between digital skills and digitalization, which strongly supports H6. The Pearson correlation ($r = 0.943$, $p < 0.01$) shows a very strong and significant linear relationship and thus confirms a robust relationship between the two variables. The mean value of digital competencies (2.94) is higher than that of digitalization (2.82), and companies with high capabilities (≥ 2.94) have a mean digitalization score of 3.55 compared to 2.33 for low skills, underlining the pronounced positive effect of skills.

Stratification by culture underlines the influence of digital skills. The results, supported by ElMassah and Mohieldin (2020), confirm that these skills increase the effectiveness of digitalization and provide a solid preliminary basis for H6, which is statistically confirmed by the two significant correlations.

In conclusion, H6 is strongly supported. The Spearman ($r_s = 0.897$, $p < 0.01$) and Pearson ($r = 0.943$, $p < 0.01$) correlations together with the descriptive difference (3.55 vs. 2.33) show that digital skills significantly increase the effectiveness of digitalization.

6. Conclusions, Implications and Limitations

6.1 General conclusions

This study examines how organizational culture influences digitalization in the tourism industry. The Competing Values Framework (CVF) is used to classify cultures as Adhocracy, Clan, Market and Hierarchy. A conceptual model linking culture to digital innovation, moderated by leadership commitment and employees' digital competencies, was tested on 10 tourism companies. The results show how cultural factors influence the success of digital transformation.

The results show that organizational culture has a varying influence on the adoption of digital technologies, which partially supports H1-H4. Adhocracy (C10, 3.8) showed the highest digitalization, which supports H1 (Leso et al., 2023; Schönherr et al., 2023). Clan culture (mean: 2.87; C1, C4, C7) moderately supported H2, which is associated with sustainability (Asif et al., 2024), although variability suggests additional influences. Market culture (mean: 2.6; C5, C9) agreed with H3 as it prioritizes competitiveness over sustainability (Guo & Xu, 2021). Hierarchy culture (mean: 2.65; C2, C3, C6, C8) resisted rapid digitalization but adhered to regulations, thus partially supporting H4 (Jewapatarakul & Ueasangkomsate, 2024).

Leadership commitment had a positive effect on digital adoption (H5), with significant correlations between concern for employees and digitalization ($r = 0.773$, $p = 0.010$; $r_s = 0.733$, $p = 0.016$), supporting the findings of Asif et al. (2024) and Vial (2021). Committed leadership (Ideal, Echilibrat, Indulgent; mean: 3.4) outperformed less committed leadership styles (Authoritarian, Laissez-Faire; mean: 2.4) and facilitated adoption in both rigid (Hierarchy) and innovative (Adhocracy) contexts.

Employees' digital skills significantly promoted digitalization (H6), with $r_s = 0.897$, $p < 0.01$ and higher scores in companies with skilled employees (3.55 vs. 2.33), in line with Jewapatarakul &

Ueasangkomsate (2024) and ElMassah & Mohieldin (2020). This effect was most pronounced in adhocratic (C10: 3.8, 4.2) and clan cultures (C7: 3.6, 4.0), where skilled employees drove digital initiatives.

The study has achieved its objectives by showing that adhocracy and clan cultures facilitate digitalization, while leadership and employee skills play a crucial moderating role.

6.2 Practical Implications

This study offers practical implications for tourism managers who want to optimize the adoption of digital innovation by aligning organizational culture, leadership and employee skills with the goals of digitalization: 1) Fostering an adhocracy culture: companies should promote flexibility and innovation (e.g. pilot projects with IoT), building on the high adhocracy score (C10: 3.8), which aligns with H1; 2) Leveraging clan culture: clan organizations (e.g. C7: 3.6) can implement customer-centric digital solutions (e.g. big data), which supports internal collaboration and H2; 3) Focus on competitiveness in market culture: companies with a market culture (mean score: 2.6) should prioritize technologies for competitive advantage (e.g. digital marketing), which is consistent with H3; 4) Overcoming hierarchical rigidity: Hierarchical cultures (mean: 2.65) can introduce compliance technologies (e.g. digital reporting) and thus reduce resistance, which is consistent with H4; 5) Employee-centric leadership: the positive correlation ($r = 0.773$, $p = 0.010$) suggests that a transformational leadership style is associated with employee training, which supports H5; 6) Developing digital skills: with $r_s = 0.897$, $p < 0.01$, organizations should provide training that raises skills above the average of 2.94, which corresponds to H6; 7) Aligning digital strategies with culture: managers can use CVF to align digitalization with cultural values, starting from a cultural audit; 8) Continuous monitoring: establishing digital performance indicators allows strategies to be adapted and ensures technological agility. These recommendations help managers to steer digitalization while leveraging organizational culture and internal capabilities.

6.3 Limitations

The study has some limitations. The study is mainly conceptual, and the example of 10 companies does not allow any generalization. Variability within cultural types (e.g., Hierarchy: 1.8-3.6) suggests unexamined factors (e.g., firm size, sector specifics) may influence results. The reliance on managerial self-reports for culture and digitalization, and employee self-assessments for competencies, introduces potential bias. Additionally, the absence of advanced statistical methods limits causal inference.

6.4 Future Research Directions

Future studies should expand the sample and include different tourism subsectors. Mixed methods (e.g. qualitative interviews) can clarify contextual factors, while longitudinal studies could assess the enduring effects of culture, leadership and competencies. Extended analyzes (e.g. multiple regression, SEM) would strengthen causal validation.

In conclusion, this study fills a gap in the understanding of how organizational culture, moderated by leadership and digital competencies, influences digital transformation in tourism. It provides a basis for strategic decision making and future empirical validation and advances both theory and practice in this area.

References

- Asif, M., Yang, L. and Hashim, M. (2024). The role of digital transformation, corporate culture, and leadership in enhancing corporate sustainable performance in the manufacturing sector of China, *Sustainability*, 16(7), 2651. <https://doi.org/10.3390/su16072651>.
- Balcıoğlu, Y.S., Çelik, A.A. and Altındağ, E. (2024). Integrating Blockchain Technology in Supply Chain Management: A Bibliometric Analysis of Theme Extraction via Text Mining, *Sustainability*, 16(22), 10032. <https://doi.org/10.3390/su162210032>.
- Bekele, H. and Raj, S. (2024). Digitalization and digital transformation in the tourism industry: a bibliometric review and research agenda, *Tourism Review*, Vol. ahead-of-print, No. ahead-of-print. <https://doi.org/10.1108/TR-07-2023-0509>.

- Blake, R.R. and Mouton, J.S. (1964). *The Managerial Grid: The Key to Leadership Excellence*. Houston, TX: Gulf Publishing Co.
- Buhalis, D. and Law, R. (2008). Progress in information technology and tourism management: 20 years on and 10 years after the Internet-The state of eTourism research, *Tourism Management*, 29(4), pp. 609-623. <https://doi.org/10.1016/j.tourman.2008.01.005>.
- Buhalis, D. and Sinarta, Y. (2019). Real-time co-creation and nowness service: Lessons from tourism and hospitality, *Journal of Travel & Tourism Marketing*, 36(5), pp. 563-582. <https://doi.org/10.1080/10548408.2019.1592059>.
- Buhalis, D., Leung, D. and Lin, M. (2023). Metaverse as a disruptive technology revolutionising tourism management and marketing, *Tourism Management*, 97, 104724. <https://doi.org/10.1016/j.tourman.2023.104724>.
- Carlisle, S., Ivanov, S. and Dijkmans, C. (2023). The digital skills divide: evidence from the European tourism industry, *Journal of Tourism Futures*, 9(2), pp. 240-266. <https://doi.org/10.1108/JTF-07-2020-0114>.
- Ciampi, F., Faraoni, M., Ballerini, J. and Meli, F. (2021). The co-evolutionary relationship between digitalization and organizational agility: Ongoing debates, theoretical developments and future research perspectives, *Technological Forecasting and Social Change*, 176, 121383. <https://doi.org/10.1016/j.techfore.2021.121383>.
- ElMassah, S. and Mohieldin, M. (2020). Digital transformation and localizing the Sustainable Development Goals (SDGs), *Ecological Economics*, 169, 106490. <https://doi.org/10.1016/j.ecolecon.2019.106490>.
- Fletcher, B. and Jones, F. (1992). Measuring Organizational Culture: The Cultural Audit, *Managerial Auditing Journal*, 7 (6), pp. 30-6.
- Gretzel, U., Fuchs, M., Baggio, R., Hoepken, W., Law, R., Neidhardt, J., Pesonen, J. and Zanker, M. (2020). "e-Tourism beyond COVID-19: A call for transformative research, *Information Technology & Tourism*, 22(2), pp. 187-203. <https://doi.org/10.1007/s40558-020-00181-3>.
- Guo, L. and Xu, L. (2021). The effects of digital transformation on firm performance: Evidence from China's manufacturing sector, *Sustainability*, 13(22), 12844. <https://doi.org/10.3390/su132212844>.
- Hartl, E. and Hess, T. (2017). The role of cultural values for digital transformation: Insights from a Delphi study. *Proceedings of the 23rd Americas Conference on Information Systems*, 1-10. <https://aisel.aisnet.org/amcis2017/Global/Presentations/8>.
- Jewapatarakul, D. and Ueasangkomsate, P. (2024). Digital organizational culture, organizational readiness, and knowledge acquisition affecting digital transformation in SMEs from food manufacturing sector, *SAGE Open*, 14(4). <https://doi.org/10.1177/21582440241297405>.
- Kumar, S., Kumar, V., Kumari Bhatt, I., Kumar, S. and Attri, K. (2024). Digital transformation in tourism sector: trends and future perspectives from a bibliometric-content analysis, *Journal of Hospitality and Tourism Insights*, 7(3), pp. 1553-1576. <https://doi.org/10.1108/JHTI-10-2022-0472>.
- Leso, B.H., Cortimiglia, M.N. and Ghezzi, A. (2023). The contribution of organizational culture, structure, and leadership factors in the digital transformation of SMEs: A mixed-methods approach, *Cognition, Technology & Work*, 25(1), pp. 151-179. <https://doi.org/10.1007/s10111-022-00714-2>.
- Li, J., Bonn, M.A. and Ye, B.H. (2019). Hotel employees' artificial intelligence and robotics awareness and its impact on turnover intention: The moderating roles of perceived organizational support and competitive psychological climate, *Tourism Management*, 73, pp. 172-181. <https://doi.org/10.1016/j.tourman.2019.02.006>.
- Li, J., Xu, L., Tang, L., Wang, S. and Li, L. (2018). Big data in tourism research: A literature review, *Tourism Management*, 68, pp. 301-323. <https://doi.org/10.1016/j.tourman.2018.03.009>.
- Nam, K., Dutt, C.S., Chathoth, P. and Khan, M. S. (2021). Blockchain technology for smart city and smart tourism: Latest trends and challenges, *Asia Pacific Journal of Tourism Research*, 24(5), pp. 454-468. <https://doi.org/10.1080/10941665.2019.1585376>.
- Önder, I. and Treiblmaier, H. (2018). Blockchain and tourism: Three research propositions, *Annals of Tourism Research*, 72, pp. 180-182. <https://doi.org/10.1016/j.annals.2018.03.005>.
- Polukhina, A., Sheresheva, M., Napolskikh, D. and Lezhnin, V. (2025). Digital solutions in tourism as a way to boost sustainable development: Evidence from a transition economy, *Sustainability*, 17(3), 877. <https://doi.org/10.3390/su17030877>.
- Quinn, R. and Rohrbaugh, J. (1981). A Competing Values Approach to Organizational Effectiveness, *Public Productivity Review*, 5, pp. 122-140.
- Quinn, R.E. and Cameron, K.S. (1983). Organizational life cycles and shifting criteria of effectiveness: Some preliminary evidence, *Management Science*, 29(1), pp. 33-51. <https://doi.org/10.1287/mnsc.29.1.33>.
- Quinn, R.E. and Spreitzer, G.M. (1991). The psychometrics of the competing values culture instrument and an analysis of the impact of organizational culture on quality of life". In R.W. Woodman & W.A. Pasmore (Eds.), *Research in Organizational Change and Development*, 5, pp. 115-142.

- Rodríguez-González, R. M., Madrid-Guijarro, A. and Maldonado-Guzmán, G. (2023). Digital organizational culture and absorptive capacity as precursors to supply chain resilience and sustainable performance, *Journal of Cleaner Production*, 424, 138411. <https://doi.org/10.1016/j.jclepro.2023.138411>.
- Schein, E.H. (2010). *Organizational culture and leadership* (4th ed.). San Francisco: Jossey-Bass.
- Schönherr, S., Eller, R., Kallmuenzer, A. and Peters, M. (2023). Organisational learning and sustainable tourism: The enabling role of digital transformation, *Journal of Knowledge Management*, 27(11), pp. 82-100. <https://doi.org/10.1108/JKM-06-2022-0434>.
- Sousa, M.J. and Rocha, Á. (2019). Digital learning: Developing skills for digital transformation of organizations, *Future Generation Computer Systems*, 91, pp. 327-334. <https://doi.org/10.1016/j.future.2018.08.048>.
- Theodorakopoulos, L. and Theodoropoulou, A. (2024). Leveraging big data analytics for understanding consumer behavior in digital marketing: A systematic review, *Human Behavior and Emerging Technologies*. 641502, pp. 1-21. <https://doi.org/10.1155/2024/3641502>.
- Trushkina, N., Abazov, R., Rynkevych, N. and Bakhautdinova, G. (2020). Digital transformation of organizational culture under conditions of the information economy, *Virtual Economics*, 3(1), pp. 7-38. [https://doi.org/10.34021/ve.2020.03.01\(1\)](https://doi.org/10.34021/ve.2020.03.01(1)).
- Vial, G. (2019). Understanding digital transformation: A review and a research agenda, *The Journal of Strategic Information Systems*, 28(2), pp. 118-144. <https://doi.org/10.1016/j.jsis.2019.01.003>.
- Vial, G. (2021). Understanding Digital Transformation: A Review and a Research Agenda. In A. Hinterhuber, T. Vescovi, & F. Checchinato (Eds.), *Managing Digital Transformation* (pp. 13-66). Routledge. <https://doi.org/10.4324/9781003008637-4>.
- Zhao, R. and Li, L. (2024). Does digitalization always benefit cultural, sports, and tourism enterprises quality? Unveiling the inverted U-shaped relationship from a resource and capability perspective, *Humanities and Social Sciences Communications*, 11, 1066. <https://doi.org/10.1057/s41599-024-03545-w>.