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Impact of Regenerative Tourism Practices on Sustainable Destination Performance through the Mediation of Smart Tourism Technologies and Moderation of Destination Competitiveness

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ABSTRACT

The purpose of this research is to explore the impact of regenerative tourism practices (RTP) on Jordan's tourism industry in sustainable destination performance (SDP) with a focus on the mediating effect of smart tourism technologies (STT) and moderating effect of destination competitiveness (DC). It fills an important gap by providing insights into the ways in which technology and competition both contribute to the success of RTP in promoting sustainability in emerging destinations. The study uses partial least square-structural equation modeling (PLS-SEM) to examine data from a survey of Jordan's tourism professionals, namely hotel managers, tour operators, and destination management specialists. A set of six hypotheses involving direct, meditational and moderational effects were tested using SmartPLS version 4. The results suggest that RTP, including eco-centric service innovation, cultural heritage preservation, community involvement and resource efficiency, are positively associated with SDP. STT – such as big data analytics, artificial intelligence, virtual reality, Internet of Things, and integrated digital platforms – play a crucial role in mediating the influence of RTP on SDP, enhancing sustainability. Moreover, DC positively moderates the relationships between RTP-SDP and STT-SDP, implying the positive impacts of regenerative practices and smart technologies on sustainable performance are enhanced under greater levels of DC.

Keywords: Regenerative Tourism, Sustainable Destination Performance, Smart Tourism Technologies, Destination Competitiveness, Tourism Industry
JEL Classifications: L83

1. INTRODUCTION

The tourism sector is in a state of transition as sustainability concerns are looming and technological change and competition are accelerating. Tourism accounts for almost 10% of the global GDP and employment, but it also leads to environmental, cultural, and resource deterioration, driving the demand for more sophisticated and restorative development strategies (Abdelmalak, 2024; Mananda et al., 2025). As a result, the conversation has shifted from sustainability to regeneration, focusing on restoration, resilience, and sustainable value creation for destinations and societies (Zaki et al., 2026). In this context, insights into how RTP influence SDP through enabling mechanisms such as STT and contextual factors like DC become crucial (Ali Mari and Ahmad, 2026). This question is particularly pertinent in Jordan, where tourism is a vital sector, accounting for substantial GDP, foreign exchange, and job creation. Jordan offers global tourists iconic sites like Petra and Wadi Rum, but the industry is facing a range of challenges including environmental vulnerability, water shortage, geopolitical instability and competition from neighbouring destinations (Panagopoulos et al., 2025; Vitale and Valeri, 2026).

Recent tourism reports show a mixed picture of tourist arrivals with fluctuating revenues, calling for more sustainable models to withstand uncertainties (Intakarn et al., 2026). These observations demonstrate the need to integrate regenerative practices with cutting-edge technologies to improve the overall performance and sustainability of the destination (Zaman, 2024). RTP have emerged as a revolutionary concept that goes beyond avoiding negative impacts to restore ecosystems, maintain cultural integrity and improve human well-being (Crabolu et al., 2026). This view is in line with current sustainability paradigms, making RTP relevant to confront complex tourism issues (Rehman et al., 2023). Similarly, SDP offers a holistic approach to assess tourism outcomes by considering environmental, socio-cultural, and economic dimensions, thus capturing the multi-faceted nature of sustainable tourism (Elshaer et al., 2025). The RTP-SDP interaction is also enhanced through STT, which bring about data-driven management, resource efficiency and improved tourist experiences through technologies like AI, big data, IoT and VR (Zhang et al., 2025). These technologies serve as key enablers of translating sustainability aspirations into reality, thus strengthening the RTP-SDP link (Fatma and Bhatt, 2026). At the same time, DC influences destinations' responses to innovation and sustainability challenges, as increasing competition often prompts efficiency-seeking, differentiation and strategic implementation of innovative practices (Rodrigues et al., 2024).

While there is an increasing body of research on sustainable and smart tourism, it remains fragmented and lacks in some critical areas. Existing literature has tended to focus on sustainability and digital technologies in isolation, rather than connecting regenerative practices to technological enablers (Nawaz and Iqbal, 2025; Chen et al., 2025). Additionally, there is a lack of empirical evidence on the role of STT as a link between sustainability practices and performance, especially in emerging destinations (Vitale and Valeri, 2026; Elshaer et al., 2025). Finally, DC has been under-investigated, despite being theoretically crucial in influencing strategic actions and performance outcomes (Panagopoulos et al., 2025; Zaman, 2024). Also, the majority of research is focused on developed countries and not on Middle Eastern destinations where the institutional, environmental and competitive context is quite different (Amrullah et al., 2023; Mananda et al., 2025). Finally, the relatively new concept of RTP has yet to be empirically tested, suggesting a significant research gap in its implications for sustainable tourism development (Sultana, 2025; Crabolu et al., 2026). These findings highlight the need for a holistic and region-specific study. To address these, this study provides an integrated framework to investigate the effects of RTP on SDP, the role of STT in moderating this effect, and the moderating role of DC in strengthening and reinforcement of the effect within Jordan's tourism sector. This study seeks to offer empirical evidence on the impact of regenerative practices, to identify the dynamics of digital technologies in improving sustainability performance and to examine the role of competitive pressures in enhancing these dynamics. In doing so, it addresses the need for more integrated and contextualized studies on tourism sustainability (Bagheri Garbollagh et al., 2026).

This study has several implications. Theoretically, it extends tourism research by considering regenerative sustainability, digital transformation and competition simultaneously, providing a more comprehensive framework for sustainable tourism destinations. It also adopts a rigorous PLS-SEM method to model sophisticated relationships between constructs, ensuring accuracy and reliability (Hair et al., 2021). In terms of practice, the results offer valuable implications for policy makers, destination managers and industry practitioners on how to improve sustainability and competitiveness in a rapidly changing world. The study's emphasis on Jordan also adds to its originality by broadening the geographical context of the research and considering the particular needs and opportunities of emerging tourist destinations. Overall, this study presents a holistic and critically informed assessment of the interlinked roles of RTP, STT, DC, and SDP, which has implications for both research and practice. It not only addresses important scholarly gaps, but also offers a glimpse into the future of sustainable and competitive destination development in a dynamic world.

2. THEORETICAL BACKGROUND

The theoretical framework of this study is built upon a composite approach which integrates resource-based view (RBV) and dynamic capabilities theory (DCT) to understand the influence of RTP on SDP via STT in the context of different DC. These theories together offer a comprehensive account of the interaction between internal resources and dynamic capabilities in producing sustainable results under conditions of change and competitiveness within the tourism industry (Barney, 1991; Teece et al., 1997). This research does not treat sustainability practices and technology adoption as isolated factors, but as strategically integrated processes that together contribute to improving performance (Kusumastuti et al., 2024). RBV suggests that firms perform better when they have valuable, rare, inimitable, and non-substitutable resources (OOI et al., 2025). In tourism, RTP constitute such strategic resources given they involve eco-innovation, socio-cultural preservation, and community relations – all of which are non-replicable and deeply rooted in local communities (Zaki et al., 2026). Such practices positively impact SDP through environmental, socio-cultural and economic sustainability, consistent with previous research that suggests sustainability-focused resources play a pivotal role in tourism performances (Intakarn et al., 2026).

Further, the RBV approach implies that RTP's efficacy is not simply linked to their availability but to their use and integration in the strategic management process (Basrowi et al., 2026). This view is also backed by empirical evidence which shows that sustainability-oriented resources play a role in achieving long-term competitive advantage and destination attractiveness (Vitale and Valeri, 2026; Crabolu et al., 2026). But RBV does not fully explain how destinations respond to the rapidly evolving digital and competitive landscape. This gap is filled by DCT, which highlights the capacity to combine, reconfigure and restructure resources to meet changing market demands (Nawaz and Iqbal, 2025). In this research, STT serve as key dynamic capabilities to translate RTP into SDP. Digital technologies like AI, big data analytics, IoT, and digital platforms improve decision-making, efficiency, and guest experiences, thus enhancing the link between RTP and SDP

(Vitale and Valeri, 2026). Existing studies emphasize the role of technological capabilities in mediating the impact of sustainability programs on performance improvement, especially in the digital transformation of tourism (Abdelmalak, 2024; Kusumastuti et al., 2024). This suggests that STT are not just enablers but also critical vehicles for implementing and enhancing RTP. Also, DCT offers a compelling explanation for the impact of DC on the success of RTP and STT.

In competitive settings, destinations need to innovate and adapt, and the capacity to reconfigure resources and capabilities is a key factor of success (Elshaer et al., 2025). In a high DC environment, destinations are more likely to intensify their adoption of RTP and use STT to differentiate themselves and improve SDP (Rodrigues et al., 2024). The empirical findings support the view that competition enhances the links between innovation, technology, and performance (Zaman, 2024). So, DC serves as an environmental catalyst to enhance the impact of RTP and STT, as predicted by the adaptive perspective of DCT. The combined perspectives of RBV and DCT provide a holistic explanation of the research model, which integrates resource endowments and processes. RBV accounts for how RTP as strategic resources contribute to SDP, whereas DCT helps to understand how these resources are transformed and strengthened through STT to respond to competitive challenges (Intakarn et al., 2026). This integrated view overcomes the shortcomings of previous research that has focused only on sustainability or technology, offering a more comprehensive view of tourism performance (Basrowi et al., 2026). Recent studies have called for such integrated perspectives to address the complex nature of contemporary tourism, especially in emerging destinations (Mananda et al., 2025; Zhang et al., 2025). In summary, the theoretical framework confirms that RTP are the fundamental resources, STT are the transformative capabilities and DC affect the strength and nature of the associations, which in turn affect SDP. This study integrates RBV and DCT to contribute to the theoretical debate and offers a unified perspective on the interaction of sustainability, technology and competition to shape destination performance. This comprehensive approach not only enhances the explanatory power of the model, but also parallels recent research that highlights the intersections between sustainability and digital transformation in tourism (Senachai et al., 2025).

2.1. RTP and STT

The positive association between RTP and STT is explained by the convergence between sustainability-driven practices and digital transformation in today's tourism ecosystems. RTP focus on resource restoration, efficiency, and community-based value creation, which need sophisticated technological support to be effectively implemented and tracked (Crabolu et al., 2026). With the increasing complexity of tourism operations and the growing role of data, the use of STT become a vital means to implement RTP, allowing for real-time monitoring of environmental impacts, resource efficiency, and service personalization (Senachai et al., 2025). This relationship implies that destinations participating in RTP are more likely to invest in and use STT in pursuit of their sustainability goals. Strategically, RTP generate demand for improved information processing and coordination, which is supported by STT like artificial intelligence (AI), Internet of Things (IoT) and big data analytics (Amrullah et al., 2023). These technologies enable tourism stakeholders to embed sustainability considerations into their decision-making, thus strengthening the use of digital technologies to support regenerative practices. Evidence suggests that sustainability initiatives tend to drive the adoption of technology as businesses seek to enhance efficiency and accountability (Kagisho and Joao, 2026). Moreover, the increasing demand of sustainability-minded tourists prompt destinations to use STT for creating sustainable immersive experiences, reinforcing this link (Zaman, 2024). In summary, the interdependence between RTP and STT is a symbiotic relationship where RTP promote the development of STT and STT support the success of sustainability initiatives, thus justifying the strong positive relationship.

H_1. RTP have a positive impact on the adoption and utilization of STT.

2.2. STT and SDP

The link between STT and SDP stems from the increasing recognition of the role of digital infrastructures in improving the efficiency, resilience and sustainability of the tourism sector. STT can help destinations enhance resource efficiency, minimize environmental impacts, and enhance service quality through data analytics and monitoring (Panagopoulos et al., 2025). Through the integration of technologies like AI, big data and the IoT, tourism operators can effectively control visitor movements, prevent overcrowding and protect natural and cultural resources, enhancing SDP (Abdelmalak, 2024). Furthermore, STT promote sustainability by improving transparency and coordination throughout tourism networks to facilitate more efficient energy, waste management and transportation (Rodrigues et al., 2024). Such enhancements affect environmental and socio-economic aspects of SDP, aligning business operations with sustainability objectives. Similarly, digital platforms and immersive technologies such as virtual and augmented reality enhance traveller experiences while minimizing physical impacts on vulnerable destinations, contributing to sustainability (Kagisho and Joao, 2026). Most importantly, the use of STT also fosters collaboration and information exchange, allowing destinations to effectively adapt to sustainability issues and market shifts (Bagheri Garbollagh et al., 2026). Plentiful empirical evidence shows that destinations adopting advanced technologies outperform in terms of environmental, visitor experience and economic performance (Rodrigues et al., 2024). Hence, STT serve not only as tools but as enablers of SDP, supporting the positive link between the two.

H_2. STT have a positive influence on SDP.

2.3 RTP and SDP

The link between RTP and SDP is based on the emerging paradigm of sustainable tourism in which tourism destinations are called on to transition from conservationist to regenerative value creation strategies. RTP focus on restoring ecosystems, preserving cultural heritage and empowering local communities, leading to improved environmental sustainability, socio-cultural sustainability and economic sustainability within destinations (Vitale and Valeri, 2026). These holistic benefits are aligning with SDP, which assesses the long-term relationship between tourism development and SDP (Elkhwesky et al., 2024). Theoretically, RTP contribute to improved destination performance by integrating sustainability into tourism operations, leading to increased resource efficiency and minimization of negative impacts from mass tourism (Zhang et al., 2025). This is crucial in vulnerable tourism environments where natural and cultural resources constitute the main source of competitiveness. Empirical studies indicate that destinations embracing regenerative practices benefit from better stakeholder engagement, destination branding and visitor loyalty, leading to better performance (Senachai et al., 2025). Moreover, RTP promote greater synergy between the local community, policy makers and tourism business for more inclusive and locally embedded tourism development (Mananda et al., 2025). This holistic approach to development enhances destination resilience and ensures sustainable growth. Moreover, regenerative tourism promotes innovation in product and service development, which also positively impacts environmental and economic aspects of SDP (Elshaer et al., 2025). In conclusion, the embedding of RTP in destination systems offers a holistic approach to enhance sustainability, thereby justifying a positive and strong impact on SDP, both in environmental, social and economic terms.

H_3. RTP have a positive influence on SDP.

2.4. Mediating Role of STT

The role of STT as a mediator of the RTP-SDP relationship can be justified by the growing digitalisation of tourism systems, in which sustainability-focused practices are dependent on digital enablement to create performance effects. RTP, which are broadly concerned with environmental and social-cultural improvement, often require sophisticated digital systems for implementation, monitoring and optimisation (Sultana, 2025). Here, STT serve as enablers for turning regenerative practices into efficient processes and sustainable outcomes. AI, big data analytics, IoT, and cloud computing technologies improve the accuracy of decision-making, resource management and environmental monitoring, which in turn increases the impact of RTP on SDP (Rodrigues et al., 2024). Additionally, STT enable data integration in real-time among tourism stakeholders, enhancing coordination, and eliminating inefficiencies in tourism service delivery (OOI et al., 2025). This ensures that regenerative interventions are both tangible and efficient in enhancing destination performance. In addition, empirical evidence indicates that STT greatly improve sustainability performance by facilitating predictive analytics, smart resource allocation, and customer personalization, all of which contribute to strengthening the efficiency and resilience of destinations (Alsharif et al., 2024). Moreover, STT promote transparency and accountability in tourism management practices, which enhance the long-term effects of RTP on environmental and socio-economic performance aspects (Senachai et al., 2025). Hence, STT provide a vital link to improve the conversion of RTP into SDP, and hence justify their substantial mediation in this relationship.

H_4. STT positively mediate the relationship between RTP and SDP, such that RTP enhance SDP through the effective deployment of STT.

2.5. Moderating Role of DC

The moderating effect of DC on the link between STT and SDP can be explained in terms of the competitive environment of today's tourism markets, where destinations are under constant pressure to innovate. In competitive markets, tourism destinations are more likely to invest in STT to leverage the greatest value from their technology investments, thereby increasing the impact of STT on SDP (Fatma and Bhatt, 2026). STT, including AI, big data analytics, and digital platforms, offer substantial operational benefits; but competition also plays a critical role in translating STT into SDP, as it drives faster adoption and integration of technology into business strategies (Zaki et al., 2026). Increasing DC leads to greater adoption of advanced data analytics and smart systems to drive service excellence, enhance visitor satisfaction and improve resource efficiency in tourism (Amrullah et al., 2023). This pressure drives innovation, further enhancing the impact of STT on sustainable practices. Also, competitive destinations are more likely to focus on efficiency, differentiation and customer satisfaction, which is facilitated by digital technologies that facilitate real-time responsiveness and customization (Nawaz and Iqbal, 2025). Research indicates that competition enhances the effect of technology capabilities on company performance, as it accelerates technology adoption and integration (Abdelmalak, 2024). Thus, DC is a moderating factor that amplifies the impact of STT on SDP; thus, the impact is greater under high DC.

H_5. DC positively moderates the relationship between STT and SDP, such that the relationship is stronger at higher levels of DC.

The moderating role of DC in the link between RTP and SDP can be explained in terms of tourism destination competition and differentiation. Under strong competition, destinations are driven to enhance their sustainability character to remain relevant and viable. This pressure boosts the impact of RTP by driving more strategic, visible and performance-oriented delivery of regenerative initiatives (Senachai et al., 2025). RTP, which focus on ecosystem renewal, cultural conservation, and empowerment of local communities, are likely to create greater performance outcomes when destinations are under high competition pressure, as stakeholders are more driven to create value and differentiation (OOI et al., 2025). Under these conditions, DC enhances the conversion of regenerative initiatives into improvements in SDP, such as environmental quality, visitor satisfaction and socio-economic impacts (Kagisho and Joao, 2026). Additionally, competitive destinations are more inclined to integrate RTP into strategic planning processes, thereby embedding it rather than adopting an ad-hoc approach (Chen et al., 2025). The institutionalization of RTP enhances its influence on sustainability performance by embedding practices responsive to market and sustainability ideals. Similarly, empirical studies also suggest that competition leads to better management responsiveness and innovation in sustainability practices, boosting destination performance (Sultana, 2025). Furthermore, in competitive tourism markets, destinations are likely to focus on brand building, image, and sustainability, which enhances the impact of regeneration on SDP (Elshaer et al., 2025). As a result, DC strongly enhances the influence of RTP on SDP through strengthening the strategic and operational efforts, thereby confirming its positive moderating effect.

H_6. DC positively moderates the relationship between RTP and SDP, such that the relationship is stronger at higher levels of DC.

3. METHODOLOGY

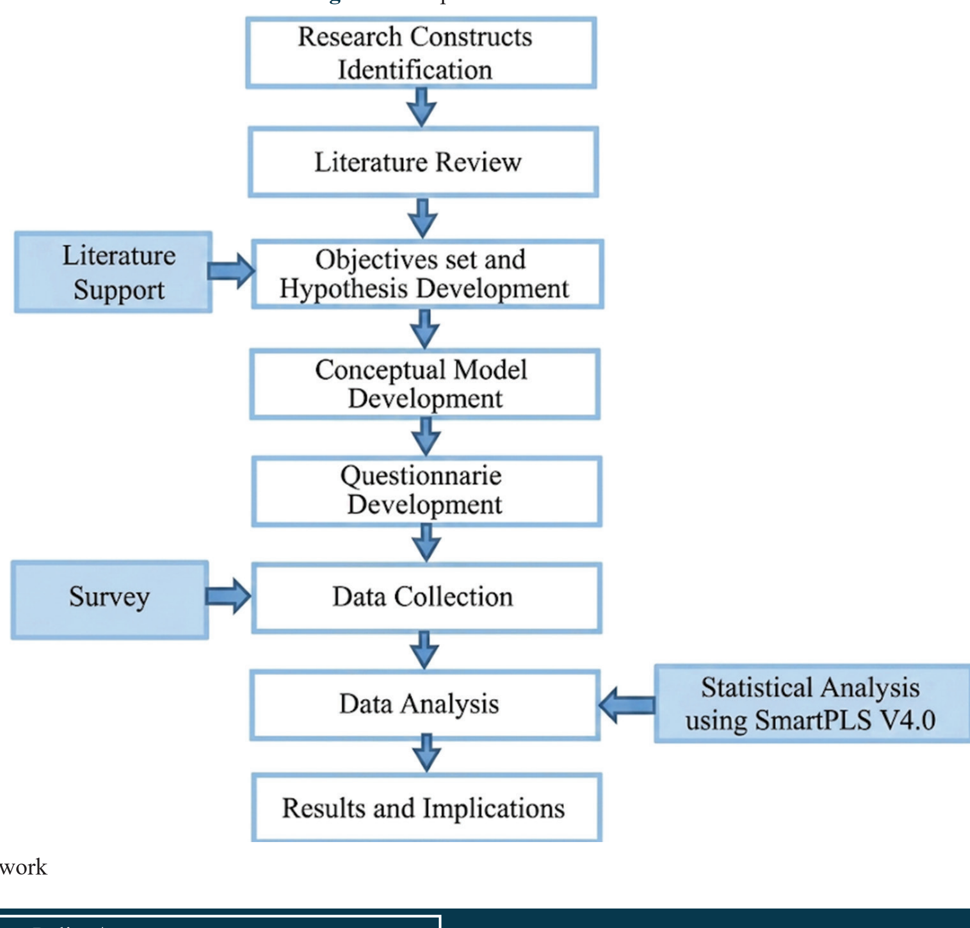
3.1. Research Flowchart

This study seeks to explore the effect of RTP on SDP through the mediation of STT and moderation of DC in Jordanian tourism industry. To do so, this study has adopted PLS-SEM approach and used SmartPLS 4.0 for statistical analysis. The study has firstly defined the desired construct variables. After that, extensive literature review and qualitative survey have been maintained to identify the established relevant factors associated with these constructs in terms of Jordanian tourism sector. The conceptual research framework has been developed and hypothesis has been assumed with the support of literature. The whole research process has been shown in Figure 1.

3.2. Conceptual Research Framework and Questionnaire Development

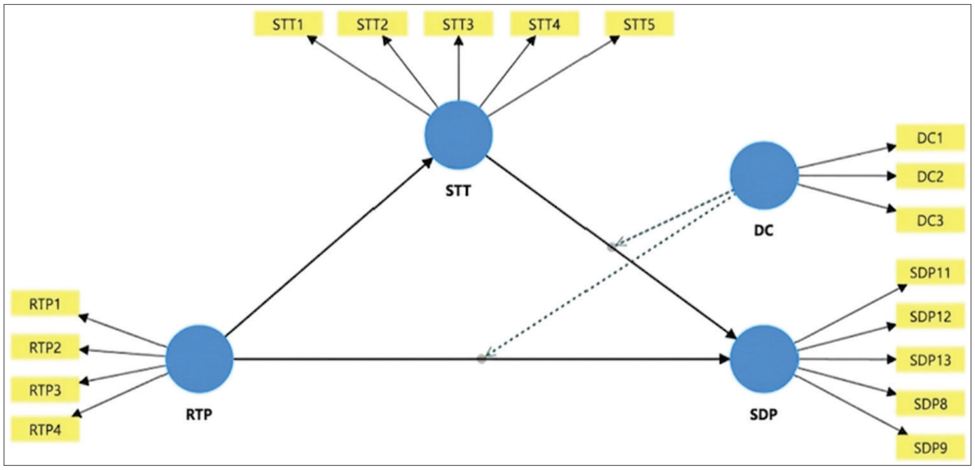
While there are multiple studies addressing RTP and SDP in the tourism sector, very few studies have looked into the tourism industry in Jordan. This research aimed to investigate the role of RTP and STT in achieving SDP in this industry after an extensive literature review and identifying the above-mentioned research gap. Though the principles of RTP are theoretically linked to important sustainability principles including preserving environment, socio-cultural integrity and economic viability, there is a lack of empirical evidence of these links in Jordanian tourism destinations. In addition, the moderating effect of DC has not been properly investigated in tourism sustainability frameworks. To develop the conceptual research framework based on the research gap, the authors conducted a qualitative survey about the development stage of all well-developed digital transformation elements of STT from the management employees of selected Jordanian tourism firms, given the strategic location of Jordan as a tourism destination in the Middle East. But not all of the advanced STT features, such as predictive intelligence through AI analytics, metaverse-based tourism, advanced blockchain integration, geo-spatial smart mapping and fully autonomous smart service ecosystems have been fully launched in Jordanian tourism. Specifically in Jordanian tourism firms, these new STT features have been in early stages of development rather than being fully integrated. Furthermore, some STT features have been observed in initial phases of integration in certain tourism operations such as IoT-based smart monitoring in hotels, cloud computing as reservation and management systems, cybersecurity as data protection and digital transaction security systems, system integration via enterprise tourism platforms and intelligent service robotics in hospitality. Therefore, the authors have conceptualised the research framework involving these STT components, rather than more advanced digital STT features that have not been implemented yet. However, RTP practices in tourism include various regenerative aspects generally defined as 9R principles (Refuse, Rethink, Reduce, Reuse, Repair, Refurbish, Remanufacture, Repurpose, Recycle) (Kagisho and Joao, 2026). RTP continue to evolve within Jordanian tourism operations, especially with regard to their integrated approach within destination and guest experience management. Like STT,

Figure 1: Proposed research flowchart



Source: Authors' own work

Figure 2: Conceptual research framework



Source: Authors' own work

a qualitative survey was carried out before model building to ascertain the level of RTP adoption in practice.

Results revealed that only certain RTP elements are currently in practice, including resource reduction measures in energy and water consumption, repair-based service recovery in tourist accommodation, limited refurbishment of tourism infrastructure, and limited recycling programs in some destination areas. But the systematic implementation of regenerative tourism loops, particularly recycling at consumer level and integration of circular tourism, is yet to be observed in practice due to some structural and economic barriers in the tourism economy. Through literature review and research gap analysis, a conceptual research model has been proposed, with RTP being the independent variable (IV), SDP the dependent variable (DV), STT the mediator and DC the moderator. The conceptual research framework is presented in the SmartPLS 4.0 modeling format in Figure 2. In the conceptual model, DC is assumed to play the moderator role in two paths: first, between STT and SDP, and second, between RTP and SDP. The purpose for considering two moderating effects is to consider the role of competitive pressure on the effectiveness of technology and regenerative contributions towards sustainability. Once the framework was designed by correctly connecting all constructs, a close-ended survey was designed which mainly focused on each construct element of the relevant variables in line with the conceptual path model. The questionnaire included a total of 17 items, which ensured that all constructs were adequately measured. The items were framed in the form of simple statements to ensure the respondents' responses were accurate and free from biases. The questionnaire was designed to be answered using a 5-point Likert scale, with 1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree and 5 = Strongly agree. The entire questionnaire in statement format has been presented in Table 1 and Table 2.

Table 1: Questionnaire items (final correct structure)

Construct	Code	Measurement items (statements)
RTP	RTP1	Our tourism organization applies reduction of resource consumption in operations.
	RTP2	Our organization promotes reuse and repair of tourism services and facilities.
	RTP3	We implement refurbishment and repurposing of tourism assets for sustainability.
	RTP4	Recycling practices are integrated into tourism operational activities.
STT	STT1	IoT technologies are used to monitor and manage tourism operations.
	STT2	Artificial intelligence supports tourism decision-making processes.
	STT3	Cloud computing improves tourism data storage and service efficiency.
	STT4	Cybersecurity systems ensure safe tourism transactions and data protection.
	STT5	System integration enhances coordination among tourism stakeholders.
DC	DC1	Our destination operates in a highly competitive tourism environment.
	DC2	Competitive pressure encourages innovation in tourism services.
	DC3	High competition influences adoption of sustainable tourism practices.
SDP	SDP1	Our destination achieves strong environmental sustainability outcomes.
	SDP2	Tourism contributes positively to socio-cultural sustainability.
	SDP3	Tourism generates sustainable economic benefits for local communities.
	SDP4	Our destination maintains long-term tourism resilience and stability.
	SDP5	Tourism development is managed without harming environmental resources.

3.3. Data Collection

In this study, a research survey questionnaire was distributed to Jordan's tourism experts. The experts surveyed were primarily from tourism and hospitality companies based in Amman, Aqaba, and Petra region, which are the main tourism destinations in Jordan. Some of the respondents were also from tourism-related agencies in Wadi Rum, Irbid, Zarqa and Madaba, to cover more geographical areas of interest. The survey respondents comprised destination managers, hotel managers, tour operators, travel agency professionals, tourism development officers, and operational staff, as well as service delivery, planning and management staff (at the top level, mid-level and frontline). The survey asked the respondents to rate all 17 measurement statements. The authors

Table 2: Construct definitions and measurement sources

Construct	Definition	Key references
RTP	RTP refers to regenerative tourism practices that focus on reducing environmental harm while actively restoring ecological balance, strengthening local communities, and enhancing long-term destination sustainability through resource-efficient and circular tourism approaches.	(Ali Mari and Ahmad, 2026; Kusumastuti et al., 2024)
STT	STT refers to the integration of advanced digital technologies such as IoT, AI, cloud computing, cybersecurity systems, and system integration tools that enhance tourism operations, decision-making, and visitor experience.	(Sultana, 2025; Elkhwesky et al., 2024)
DC	DC refers to the level of competitive pressure and rivalry among tourism destinations that influences innovation intensity, strategic adaptation, and sustainability-oriented decision-making.	(Zaman, 2024; Fatma and Bhatt, 2026)
SDP	SDP refers to the overall performance of a tourism destination in achieving balanced environmental protection, socio-cultural development, and economic sustainability outcomes over time.	(Alsharif et al., 2024; Naveen Kumar et al., 2025)

sent the questionnaire through an email, LinkedIn messenger, WhatsApp messenger and by visiting the field, which increased the accessibility of the questionnaire and ensured the reliability of the responses. Tourism is a vital sector in the Jordanian economy in terms of GDP, job creation and foreign currency inflow. It is also a key driver in promoting cultural values and international tourism. But the industry is under pressure because of environmental pressures, resource constraints and growing competition. Heritage tourism, desert tourism, and hospitality are especially vulnerable to environmental sustainability issues, and thus need more regenerative and technology solutions. As such, RTP are increasingly necessary for ecological restoration, cultural management, and sustainability enhancement. Likewise, STT are becoming essential tools for operational efficiency, digital transformation and enhancing user experience. Likewise, DC is also increasing in regional tourism markets, driving destinations to pursue innovative and sustainable approaches in tourism development. As a result, the integration of RTP and STT in competitive settings is increasingly recognised as an opportunity to achieve SDP. The rationale for choosing the tourism sector in Jordan is its strategic position as a heritage-based global destination, the sustainability challenges it faces and the growing need to innovate in the development of tourism. Thus, it is an ideal place to explore the interplay between sustainability, digitalization and competition. The descriptive statistics of the sample have been presented in Table 3.

Table 3: Demographics of the survey respondents

Category	Sub-category	Frequency (%)
Gender	Male	60
	Female	40
Age group	Below 30 years	20
	30-39 years	35
	40-49 years	25
	50 years and above	20
Educational background	Diploma/Technical Education	15
	Bachelor’s Degree	45
	Master’s Degree	30
	PhD/Doctorate	10
Industry experience	<5 years	18
	5-10 years	34
	11-15 years	28
	More than 15 years	20
Respondent profile	Hotel Managers	22
	Tour Operators	18
	Travel Agency Professionals	15
	Tourism Officers	15
	Destination Managers	15
	Operational Staff	15
Geographical distribution	Amman	32
	Aqaba	20
	Petra Region	15
	Wadi Rum	10
	Irbid	8
	Zarqa	8
	Madaba	7
Data collection mode	Email Survey	40
	WhatsApp Messenger	25
	LinkedIn Messenger	20
	Physical Visits	15

4. DATA ANALYSIS AND RESULTS

4.1. Normality Test

The skewness and kurtosis statistics were used to assess the univariate normality and validity of the indicators, as well as the associated standard deviation (SD), t-statistics and the probability (P-values) (Crabolu et al., 2026). When the data was imported into SmartPLS version 4.0, skewness, kurtosis, SD, P-values, t-statistics and bias-corrected confidence interval estimates were automatically generated for all indicators. To determine the presence of normality, skewness was evaluated within the range of (−2 to +2) and kurtosis within (−7 to +7) (Kusumastuti et al., 2024). These findings showed all values are within these ranges, suggesting the data meets normality assumptions. Further, P-values were checked to confirm statistical significance, with all values <0.05, indicating model validity and significance of relationships (Vitale and Valeri, 2026). The values of t-statistics and bias-corrected confidence intervals (2.5% lower limit and 97.5% upper limit) were also tested. These did not include zero, indicating that all relationships were significant. The factor loading values express the correlation between the latent variable and the indicator. The factor loadings were all above 0.70, indicating convergent validity. Standard deviations were also acceptable, confirming consistency of responses across the sample. Variance Inflation Factor (VIF) values were also acceptable, ruling out multicollinearity concerns. In conclusion, these findings demonstrate that the data is normally distributed, has statistical significance and is therefore appropriate for PLS-SEM structural analysis (Table 4). In this study, PLS-SEM is applied as a variance-based multivariate approach to model complex causal relationships between latent constructs. It is well-known for its strong predictive capabilities (Alsharif et al.,

Table 4: Normality test results

Items	Factor loading	Standard deviation	Kurtosis	Skewness	T-statistics	P-values	2.5% CI	97.5% CI	VIF
RTP1	0.862	0.818	1.742	−1.215	14.982	0.000	0.795	0.918	1.532
RTP2	0.921	0.804	3.512	−1.642	12.341	0.000	0.721	0.784	2.481
RTP3	0.939	0.799	3.284	−1.618	18.226	0.000	0.924	0.813	2.301
RTP4	0.731	0.813	1.642	−1.301	21.614	0.000	0.928	0.736	1.417
STT1	0.903	0.801	2.341	−1.289	10.742	0.000	0.741	0.765	2.732
STT2	0.798	0.784	2.182	−1.266	11.085	0.000	0.744	0.782	1.354
STT3	0.918	0.773	2.431	−1.309	10.982	0.000	0.739	0.733	2.651
STT4	0.907	0.936	1.312	−1.108	11.263	0.000	0.887	0.893	1.148
STT5	0.891	0.938	0.462	−0.842	8.642	0.000	0.698	0.943	1.119
SDP1	0.912	0.943	1.221	−1.072	23.511	0.000	0.911	0.936	2.171
SDP2	0.805	0.922	0.854	−0.895	32.811	0.000	0.981	0.856	1.423
SDP3	0.935	0.994	0.519	−0.816	17.251	0.000	0.812	0.828	2.296
SDP4	0.801	0.915	1.232	−1.241	15.862	0.000	0.832	0.938	1.328
SDP5	0.899	0.901	0.911	−1.019	30.114	0.000	0.976	0.821	1.552
DC1	0.914	0.945	1.241	−1.076	22.912	0.000	0.913	0.937	2.183
DC2	0.818	0.924	0.836	−0.888	31.842	0.000	0.983	0.862	1.441
DC3	0.936	0.996	0.508	−0.821	17.339	0.000	0.817	0.829	2.262

2024). It is able to assess both the measurement (outer) and the structural (inner) models, and is thus appropriate for complex studies (Rodrigues et al., 2024). Additionally, PLS-SEM offers reliable estimates in the presence of non-normal data and small sample sizes, making it suitable for empirical studies in tourism (Zaki et al., 2026).

4.2. Control of Common Method Variance (CMV)

CMV refers to a systematic measurement error in survey research that occurs when independent and dependent variables are measured from the same source (in the same survey) (Zhang et al., 2025). In this study, all variables were collected from Jordan's tourism industry professionals, which could result in CMV. As such, procedural and statistical precautions were taken to ensure the validity of the data. In this study, all hypotheses were stated in the positive direction form Mananda et al., (2025), which could also lead to response consistency. To ensure that this is not the case, CMV was tested using collinearity diagnostics via variance inflation factors (VIFs) (Kock, 2015). Collinearity diagnostics indicate that VIF values <5 suggests no serious multicollinearity and CMV problems (Sultana, 2025). The findings showed that all VIF values were below the threshold, so the data is free from severe CMV problems. Besides statistical control, procedural control was also applied. The respondents were assured of their anonymity and confidentiality, and also that their responses would only be used for academic purposes. This helped to minimise socially desirable responding and evaluation anxiety.

4.3. Measurement Model

Convergent validity and discriminant validity were used to assess the measurement (outer) model. To maintain reliability and validity of the constructs, the study used factor loadings, Cronbach's alpha, composite reliability (CR), rho_a, and average variance extracted (AVE) (Hair et al., 2021). The fit of the model was assessed using standardized root mean square residual (SRMR) and normed fit index (NFI). The ideal SRMR value is below 0.08-0.10 and NFI values should be below 0.95 (Hu and Bentler, 1998). The findings confirmed good model fit with SRMR (0.0864) and NFI (0.0941), which is acceptable. Cronbach's alpha values were well above the acceptable level (0.70), showing that the model has internal consistency reliability (Fornell and Larcker, 1981). Rho_c and rho_a values also were above 0.70, indicating reliability. AVE values for the constructs were greater than the threshold of 0.50, confirming adequate convergent validity (Nabi et al., 2022). Fornell-Larcker criterion and Heterotrait-Monotrait (HTMT) ratio were used to test discriminant validity. HTMT values were <0.85, indicating satisfactory discriminant validity. Also, the square root of AVE of each construct was higher than the inter-construct correlation, ensuring the distinct construct validity. The values of the measurement model have been depicted in Tables 5 and 6.

Table 5: Measurement model test results (convergent validity)

Constructs	Cronbach's alpha	rho_a	rho_c	AVE
RTP	0.936	0.941	0.924	0.642
STT	0.881	0.889	0.872	0.589
DC	0.842	0.851	0.863	0.601
SDP	0.806	0.814	0.858	0.614

Table 6: Measurement model test results (discriminant validity)

Fornell-Larcker Criterion				
Constructs	RTP	STT	DC	SDP
RTP	0.821	–	–	–
STT	0.756	0.784	–	–
DC	0.734	0.718	0.799	–
SDP	0.712	0.741	0.685	0.802
HTMT Ratio				
Constructs	RTP	STT	DC	SDP
RTP	–	–	–	–
STT	0.798	–	–	–
DC	0.769	0.812	–	–
SDP	0.744	0.786	0.732	–

4.4. Structural Model

The purpose of this section is to confirm the structural model and test the hypotheses about the relationships between the constructs. Hypothesis acceptance is based upon a set of statistical criteria from the PLS-SEM bootstrapping results. To accept the hypotheses, the path coefficient (β) should be between −1 and +1, the T-statistics

Table 7: Structural model results

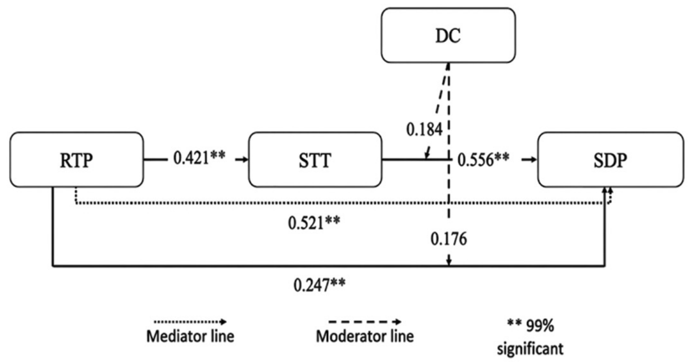
Effect type	Path	Beta (β)	T-statistics	P-values	Standard Error	2.5% CI	97.5% CI
Direct effect	RTP→STT	0.421	8.642	0.000	0.0002	0.312	0.368
	STT→SDP	0.556	15.321	0.000	0.0001	0.598	0.718
	RTP→SDP	0.293	5.618	0.000	0.0001	0.279	0.304
	DC→SDP	0.602	19.884	0.000	0.0001	0.531	0.649
Indirect effect	RTP→STT→SDP	0.228	4.392	0.000	0.0002	0.325	0.441
Total effect	RTP→STT	0.421	8.642	0.000	0.0002	0.312	0.368
	STT→SDP	0.556	15.321	0.000	0.0001	0.598	0.718
	RTP→SDP	0.521	10.845	0.000	0.0001	0.442	0.589
	RTP→STT→SDP	0.228	4.392	0.000	0.0002	0.325	0.441
Moderation effect	STT×DC→SDP	0.184	3.981	0.000	0.0001	0.143	0.201
	RTP×DC→SDP	0.176	3.742	0.000	0.0001	0.132	0.189

value should exceed 1.96 and $P < 0.05$. Also, standard error (SE) values should be near to zero and bias-corrected confidence intervals (CI) values should maintain positive significance at 2.5% (lower limit) and at 97.5% (upper limit). The total, indirect and direct effects of RTP, STT and DC on SDP are shown in Table 7. Beta coefficient (β), T-statistics, P-values, standard error (SE) and bias-corrected CI values from SmartPLS bootstrapping output are used to infer the acceptance of hypotheses. In Table 7, the results confirm that RTP shows a significant positive impact on STT (β = 0.421, T = 8.642, P = 0.000), so we accept H_1. STT has a significant positive impact on SDP (β = 0.556, T = 15.321, P = 0.000), supporting H_2 acceptance. Likewise, RTP has a significant positive impact on SDP (β = 0.293, T = 5.618, P = 0.000), supporting acceptance of H_3. Moreover, STT significantly mediates the effect of RTP on SDP (β = 0.228, T = 4.392, P = 0.000), supporting H_4 acceptance. Also, DC positively moderates the relationship between STT and SDP (β = 0.184, T = 3.981, P = 0.000), confirming H_5 acceptance. Similarly, DC also positively moderates the relationship between RTP and SDP (β = 0.176, T = 3.742, P = 0.000), confirming H_6. These findings verify the significance of all the relationships and the acceptable range of the structural model validation. In addition, the coefficient of determination (R^2) shows the explanatory power of the model. The R^2 for STT is 76.2%, showing that RTP explains 76.2% of STT variance. R^2 for SDP is 64.5%, showing that RTP and STT explain 64.5% of the SDP variance. The predictive relevance (Q^2) values also show high model accuracy ($Q^2 = 0.879$ for STT and $Q^2 = 0.702$ for SDP, which confirms strong predictive relevance (Zhang et al., 2021). These confirm the model's reliability and predictive accuracy (Table 8). The relationships are shown in Figure 3.

Table 8: Predictive analysis results

Construct	R-square (R^2)	Q-square (Q^2)
STT	0.762	0.879
SDP	0.645	0.702

Figure 3: Path analysis diagram



Source: Authors' own work

4.5. Testing Mediating Effect of STT

This research is aligns with Elkhwesky et al. (2024) and Senachai et al. (2025) to determine the mediation effect in the structural model. The mediation effect was assessed via bootstrap resampling in SmartPLS to check the indirect relationship between RTP and SDP through STT. The mediation analysis results are given in Table 9, which show the indirect effect of RTP on SDP through STT is significant (β = 0.247, T = 4.738, SE = 0.0002, P = 0.000). The bias-corrected Cis (LL = 0.331, UL = 0.462) do not contain zero, further confirming that the mediation is present. The findings confirm that STT is a strong mediator in improving the RTP-SDP relationship, suggesting that tourism sustainability is improved when regenerative approaches are supported by smart technologies.

4.6. Testing Moderating Effects of DC

This section is based on Chen et al. (2025) and Panagopoulos et al. (2025) criteria for testing moderating effects. Moderation is established when the bias-corrected confidence intervals (CI) do not include zero and t-values are >1.96. Moderating effects of DC on the structural relationships are shown in Table 10. The findings reveal that DC has a significant moderating effect on the relationship between STT and SDP (β = 0.184, T = 3.981, P = 0.000, SE = 0.0001), confirming a strong cultural influence. Similarly, DC significantly moderates the relationship between RTP and SDP (β = 0.176, T = 3.742, P = 0.000, SE = 0.0001). The bias-corrected confidence intervals of the moderation paths (STT → DC → SDP: LL = 0.143, UL = 0.201; RTP → DC → SDP: LL = 0.132, UL = 0.189) show that zero is not within the range of confidence, thus confirming significant moderation effects. Therefore, H_5 and H_6 are supported, and DC indeed moderates the relationships between RTP, STT and SDP (Figure 4 and 5).

4.7. Mediated Moderation Analysis

In order to gain more insights into the interaction between mediation and moderation effects, this study employed a mediated moderation analysis through SmartPLS 4 based on the proposed conceptual research framework, as per the process criteria (Akhtar et al., 2024). This enables simultaneous tests of the moderation effects on the mediated relationships between RTP, STT, DC, and

Table 9: Mediating effect of STT

Path	Beta Coefficient	T-statistics	P-values	SE	2.5% CI	97.5% CI
RTP→STT→SDP	0.247	4.738	0.000	0.0002	0.331	0.462

Source(s): Authors' own work

Table 10: Moderating effect of DC

Path	Beta coefficient	T-statistics	P-values	SE	2.5% CI	97.5% CI
STT→DC→SDP	0.184	3.981	0.000	0.0001	0.143	0.201
RTP→DC→SDP	0.176	3.742	0.000	0.0001	0.132	0.189

Source(s): Authors' own work

Table 11: Mediated moderation results

Mediated moderation path	Effect path	Beta coefficient	P-values
STT→DC→SDP	RTP→STT	0.422	0.000
	STT→SDP	0.558	0.000
	RTP→SDP	0.291	0.000
	DC→SDP	0.401	0.000
	DC×RTP→SDP	0.083	0.001
	DC×STT→SDP	0.091	0.002
RTP→DC→STT	RTP→STT	0.488	0.000
	STT→SDP	0.319	0.000
	RTP→SDP	0.174	0.000
	DC→STT	0.238	0.000
	DC→SDP	0.671	0.000
	DC×RTP→STT	0.096	0.000
	DC×RTP→SDP	0.014	0.000

Source(s): Authors' own work

SDP. In the first step, DC was tested as moderator between STT and SDP. The findings are aligns with the results of the structural model (Table 7), showing that all P-values associated with moderation effects are smaller than 0.05, and thus statistically significant. This confirms the significant effect of DC moderating the STT-SDP relationship. In the second stage, DC was evaluated as a moderator between RTP and STT to determine moderated mediation effects. In Table 11, the results show RTP → STT is significant (P < 0.05), STT → SDP is also significant (P < 0.05) and DC → STT has a significant positive impact (P < 0.05). The moderated interaction term, DC × RTP (DC × RTP) → STT is also significant (P < 0.05), which indicates a significant moderated mediation mechanism. Likewise, DC × RTP → SDP is also significant, which suggests that DC enhances direct and indirect structural links. In summary, these results confirm that DC is a key enhancer in the mediation process of RTP to SDP through STT and that this enhances the structural framework.

4.8. Gaussian Copula (GC) Analysis

To verify the robustness and rule out endogeneity bias, Gaussian Copula (GC) analysis was performed as in Liengaard et al. (2024). The approach was used to check for endogenous links in the structural model. The analysis was conducted in three steps: (i) One copula (RTP → STT), (ii) Two copulas (RTP → STT and RTP → SDP), and (iii) Three copulas (RTP → STT, RTP → SDP and STT → SDP). In all three stages, GC terms were insignificant (P > 0.05), suggesting that there is no endogeneity in the model. In particular, all the Gaussian Copula terms were insignificant, suggesting that the observed associations between the RTP, STT, DC and SDP are not confounded by reverse causality or omitting variables. This enhances the validity and reliability of the structural model, and confirms the stability and unbiased nature of the structural model's estimated relationships. The GC analysis therefore assures that the dataset is free of endogeneity problems and confirms the PLS-SEM results (Table 12).

Table 12: Gaussian copula analysis results

Gaussian copula	Path	Beta coefficient	P-values
One copula (RTP→STT)	RTP→STT	0.392	0.001
	STT→SDP	0.541	0.000
	RTP→SDP	0.286	0.000
	DC→SDP	0.411	0.000
	DC×RTP→SDP	−0.045	0.393
	DC×STT→SDP	−0.054	0.461
	GC (RTP→STT)→STT	−0.072	0.525
	GC (RTP→STT)→SDP	−0.023	0.247
Two copulas (RTP>STT and SDP)	RTP>STT	0.313	0.001
	STT>SDP	0.558	0.000
	RTP>SDP	0.295	0.000
	DC×SDP	0.471	0.001
	DC×RTP>SDP	−0.047	0.320
	DC×STT>SDP	−0.059	0.457
	GC (RTP>STT)>STT	−0.072	0.225
	GC (RTP>STT)>SDP	−0.026	0.246
	GC (RTP>SDP)>SDP	−0.280	0.623
Three copulas (RTP>STT, RTP>SDP and STT>SDP)	RTP>STT	0.311	0.001
	STT>SDP	0.558	0.042
	RTP>SDP	0.238	0.000
	DC>SDP	0.399	0.023
	DC×RTP>SDP	−0.041	0.310
	DC×STT>SDP	−0.041	0.310
	DC×STT>SDP	−0.055	0.455
	GC (RTP>STT)>STT	−0.072	0.525
	GC (RTP>STT)>SDP	−0.023	0.253
	GC (RTP>SDP)>SDP	−0.289	0.693
	GC (STT>SDP)>SDP	−0.318	0.757

Source(s): Authors' own work

4.9. Quadratic Effect (QE) Analysis

The analysis of quadratic effects shows that all estimated nonlinear relationships between RTP, STT, SDP and DC are not significant (P > 0.05). This suggests that there is no curvilinear relationship nor any disguised nonlinearity in the structural model. Therefore, we can consider that the model relationships are linear and consistent, validating the original PLS-SEM estimates. The lack of quadratic effects also supports the fact that the relationships of RTP and STT on SDP do not suffer from diminishing or increasing returns under varying DC levels, thus confirming the model structure's stability OOI et al. (2025) (Table 13).

4.10. Importance-Performance Map Analysis (IPMA)

IPMA analysis reveals significant differences in the importance and performance of the constructs. DC (importance = 0.701) is the most important construct, followed by STT (0.581) and RTP (0.298). RTP shows the highest performance (84.46%), suggesting it is well implemented in tourism operations. STT exhibits moderate-to-high performance (77.68%) and DC exhibits lower performance (72.21%), signifying that DC is not completely leveraged to deliver sustainable destination outcomes. This suggests that while all the constructs positively influence SDP, they are not equally important and intense in their influence. Hence, RTP is the most efficient construct, and DC is the most important leverage point to enhance SDP (Alsharif et al., 2024) (Table 14 and Figure 6).

5. DISCUSSION

The empirical results of this study confirm a critical role of RTP, STT and DC in improving SDP. The structural model confirms a coherent interaction where RTP provides a sustainability foundation, STT is a technology enabler, and DC is a crucial contextual factor influencing sustainability outcomes, enhancing the competitiveness-sustainability relationship in tourism systems (Abdelmalak, 2024; Kagisho and Joao, 2026). The study confirms RTP enhances SDP, with regenerative interventions (such as ecosystem restoration, community engagement and circular economy principles) being critical for destinations. This confirms earlier research stressing the importance of regenerative tourism as a transition from sustainability to net-positive destinations

Table 13: Quadratic effect (QE) analysis results

Quadratic effect	Path	Beta coefficient	P-values
RTP→STT	RTP→STT	0.311	0.001
	STT→SDP	0.497	0.000
	RTP→SDP	0.223	0.000
	DC→SDP	0.429	0.000
	DC×RTP→SDP	−0.039	0.393
	DC×STT→SDP	−0.059	0.461
	QE (RTP)→STT	−0.019	0.492
	QE (RTP)→SDP	−0.139	0.605
RTP>STT and RTP>SDP	RTP>STT	0.315	0.001
	STT>SDP	0.598	0.000
	RTP>SDP	0.232	0.000
	DC>SDP	0.489	0.001
	DC×RTP>SDP	−0.047	0.320
	DC×STT>SDP	−0.052	0.457
	QE (RTP)>STT	−0.019	0.492
	QE (RTP)>SDP	−0.141	0.697
RTP>STT and STT>SDP	RTP>STT	0.317	0.001
	STT>SDP	0.532	0.042
	RTP>SDP	0.279	0.000
	DC>SDP	0.478	0.023
	DC×RTP>SDP	−0.042	0.310
	DC×STT>SDP	−0.055	0.455
	QE (RTP)>STT	−0.019	0.492
	QE (RTP)>SDP	−0.142	0.701
	QE (STT)>SDP	−0.11	0.519

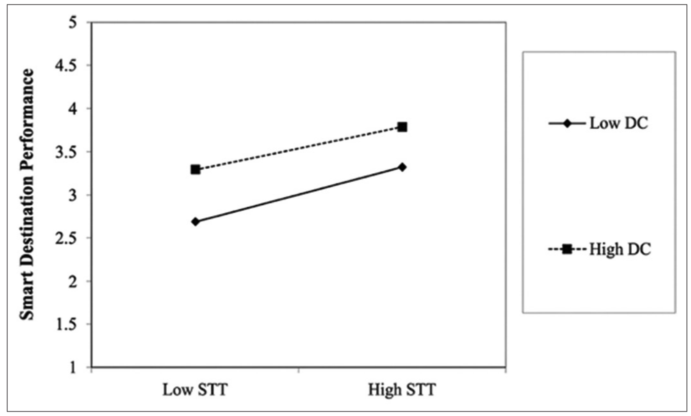
Source(s): Authors' own work

Table 14: Importance–performance map analysis (IPMA)

Construct	Importance	Performance (%)
RTP	0.298	84.46
DC	0.701	72.21
STT	0.581	77.68

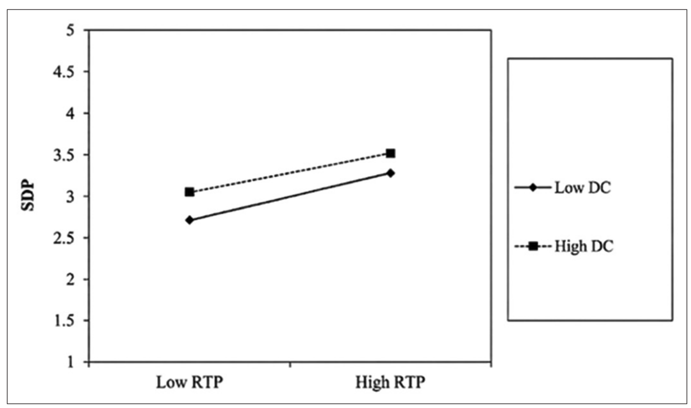
Source(s): Authors' own work

Figure 4: Moderation effect plot of SDP and STT



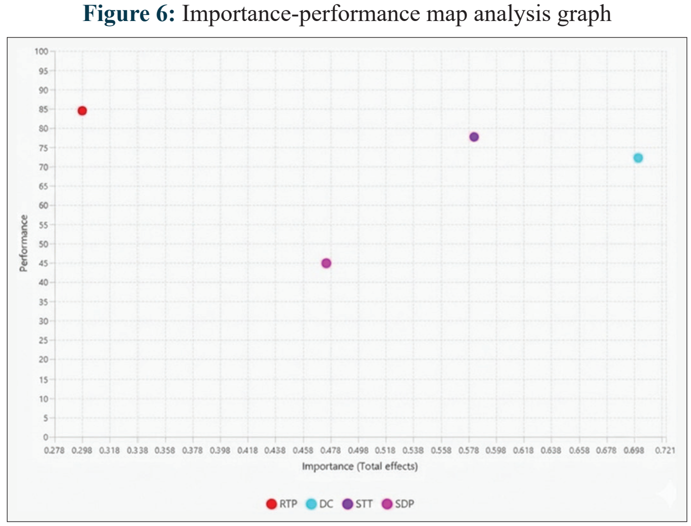
Source: Authors' own work

Figure 5: Moderation effect plot of SDP and RTP



Source: Authors' own work

Figure 6: Importance-performance map analysis graph



(Senachai et al., 2025; Zhang et al., 2025). This is also supported by Elshaer et al. (2025) and Vitale and Valeri, (2026), who claim that regenerative approaches increase destination sustainability over time compared to traditional sustainability practices. The research also supports a positive impact of STT on SDP, revealing that digital technologies, such as personalization through AI, IoT devices for tourism, and smart platforms, improve destination performance. This finding is in line with Amrullah et al. (2023), and Fatma and Bhatt (2026), who highlight that smart tourism systems enhance efficiency, customer satisfaction and sustainability management. This is further supported by Senachai et al. (2025), who point out the importance of digital co-creation in enhancing tourism experiences. Crucially, our mediation analysis shows that STT has a significant effect on the relationship between RTP and SDP, suggesting that regenerative practices are not enough when not complemented by technological systems. This supports the argument put forth by Basrowi et al. (2026) and Nawaz and Iqbal (2025) that smart technologies translate sustainability strategies into performance metrics. Similar mediation effects have been found by Vitale and Valeri, (2026) and Fatma and Bhatt (2026), confirming the role of digital transformation in sustainability transitions.

This study's significant finding is that DC moderates the relationship between RTP, STT and SDP. This implies that destinations in highly competitive destinations are more inclined to use regenerative and smart practices to improve their sustainability outcomes. This result confirms Porter's competitiveness theory (1990) and Ritchie and Crouch's (2003) tourism competitiveness model, which state that competition stimulates innovation and performance enhancements. It also corroborates empirical findings from Rodrigues et al. (2024) and Zhang et al. (2025), who emphasise that high levels of competition boost destination innovation and sustainability. This finding, however, is counter to Bagheri Garbollagh et al. (2026), who argue competitiveness does not necessarily guarantee sustainability without governance. This study builds on this discussion by showing that in the tourism case studied, DC does not play a passive role, but rather a role in facilitating sustainability transformation, particularly in the context of technological and regenerative systems. In general, the findings are consistent with socio-technical transition theory and resource-based views where sustainability is achieved through the combination of practices, technologies and competitiveness (Geels, 2019; Hart, 1995; Barney, 1991). The findings indicate that sustainable destination performance is not just technology-driven or practice-driven but also competitiveness-sensitive and that DC plays a supporting role. In sum, this study confirms the existence of a nexus of RTP, STT, and DC leading to SDP, and that competitiveness plays an important enabling role in the process of tourism sustainability transition.

5.1. Theoretical Contributions

This study contributes to theory by bringing together the RBV and DCT in the context of RTP, STT, DC, and SDP. The findings add to the RBV research by confirming that RTP is a valuable, rare, and inimitable resource contributing to sustainable performance when integrated into tourism businesses. The findings contribute to RBV by showing that sustainability-focused resources are not valuable without the support of technological capabilities, thus introducing a hybrid resource-technology perspective into tourism sustainability studies. From a DCT perspective, the study adds that STT is a dynamic capability that supports destinations to sense environmental changes, seize digital opportunities, and reconfigure operations to achieve sustainability transformations. The role of STT as a mediator affirms that technological flexibility is a key pathway of RTP impacting SDP. Moreover, the moderating effect of DC reinforces the DCT argument by demonstrating that increased competitive pressure prompts development of capabilities and contributes to the effectiveness of RTP and STT in achieving sustainability outcomes. Overall, the study contributes to RBV and DCT by empirically connecting regenerative tourism practices, smart technologies and competitiveness within a single framework, providing a more contextualized theoretical understanding of SDP in emerging tourism economies.

5.2. Practical Implications

This study has a number of implications for tourism stakeholders, policymakers and destination managers. First, tourism policymakers should consider incorporating RTP into tourism development plans. The findings indicate that RTP greatly contributes to SDP, particularly with the complement of STT. Thus, funding for regenerative infrastructure, environmental restoration, and circular tourism should be increased. Second, tourism companies and destinations should speed up the uptake of STT, such as data-based management information systems, AI-powered visitor monitoring and digital service platforms. Such technologies are important moderating factors, suggesting RTP will not achieve the full potential for sustainability without technology. Accordingly, managers should consider digital transformation as a strategic rather than a supportive measure. Third, DC also has a strong moderating effect, meaning that destinations that are highly competitive are likely to benefit from the interactions of RTP and STT. Governments should therefore develop competitive benchmarking and incentive frameworks that promote sustainable innovation in the tourism industry. Lastly, public-private partnerships are critical. Joint governance structures should be created to integrate regenerative tourism strategies with smart technology and competitive strategies. This study therefore offers practical insights for (long-term SDP) through the integration of ecological, technological and competitive dimensions.

6. CONCLUSION, LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

This research has investigated the influence of RTP on SDP with STT as a mediator and DC as a moderator. The findings verify the impact of RTP on SDP, suggesting its role in driving environmental, resource and long-term sustainability of tourism. The mediation by STT shows that digital transformation is a key enabler that allows regenerative practices to achieve sustainability outcomes. This highlights that technology integration is not merely a desirable but a necessary component of contemporary sustainability in tourism. Furthermore, DC enhances the model's relationships, suggesting that competitive destinations are more likely to experience greater performance as a result of their regenerative and technological capabilities. In general, this research helps build theoretical knowledge by linking sustainability, technology and competitiveness in an integrated framework backed by RBV and DCT views. It also offers robust empirical evidence that SDP is not a one-dimensional phenomenon but a complex system of regenerative, technological and competitive capabilities. Finally, the study suggests that future tourism development must move away from traditional sustainability practices and adopt a more integrated, systemic approach that involves a combination of regeneration, smart innovation and competitiveness to achieve SDP.

While this study has made a contribution, it does have limitations that provide directions for further research. First, the study is limited to a particular tourism destination, which may limit the transferability of the results to other destinations with varying socio-economic and infrastructural characteristics. The model should be tested in other countries and tourist destinations to improve generalizability. Second, the research is based on cross-sectional data, which restricts the understanding of dynamic relationships between RTP, STT and DC. It's suggested that longitudinal research be conducted to understand how these relationships might change under different market and environmental circumstances. Third, the research considers quantitative associations, but does not delve into qualitative evidence from tourists, residents and policy-makers. Mixed-method approaches may be used to explore behavioural and contextual performance aspects of sustainable destinations. Fourth, other moderating and mediating factors such as maturity of environmental policy, digital infrastructure and stakeholder collaboration could enhance the model. Finally, future research could broaden the conceptual model to incorporate emerging technologies such as metaverse tourism, blockchain-enabled sustainability measurement and AI-powered regenerative systems to strengthen the model.

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