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From Green Digital Transformation to Hotel Performance: The Roles of Dynamic Capabilities, Innovation Capabilities, and Organizational Resilience

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Abstract

The hotel industry has acknowledged the growing environmental concern and recognized the significance of adopting sustainable practices. The existing literature on the hotel industry reflects a discernible gap between green digital transformation and green dynamic capabilities, green innovation capabilities, and organizational resilience. Therefore, this study aims to examine the relationships between green digital transformation, green dynamic capabilities, green innovation capabilities, organizational resilience, and organizational performance. Using purposive sampling, data were gathered from 329 managers working in four Chinese cities and analyzed through partial least squares structural equation modeling (PLS-SEM). The findings highlight the significant positive association between green digital transformation, green dynamic capabilities and green innovation capabilities, which, in turn, are positively associated with hotel resilience. Furthermore, organizational resilience is significantly associated with process innovation, service innovation, and organizational performance. Practically, the study's findings help encourage hotel managers to implement digital technologies to improve hotels' efficiency and organizational performance. Moreover, the study encourages regulatory authorities to support green digitalization initiatives and improve hotels' performances.

Keywords: green digital transformation; green dynamic capabilities; green innovation capabilities; organizational resilience; hotels

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1. Introduction

The excessive use of natural resources by hotels has contributed significantly to environmental pollution [1,2]. Research shows that the hotel industry has been a significant contributor to environmental degradation through excessive consumption of water and energy, as well as the generation of solid wastes [3,4]. In relation to this, digital transformation and green initiatives are essential catalysts to contribute to environmental protection [5,6]. Green digital transformation embraces digital technologies and promotes sustainability-driven initiatives in the hotel industry [7]. Research indicates that digital transformation in hotels has improved organizations' operational efficiency [8]. The application of modern technologies such as the Internet of Things (IoT) fosters more efficient resource utilization and helps in economic growth and in achieving ecological balance [8,9]. In addition, emerging technologies such as energy monitoring systems help track energy

use and contribute to proper management of water and waste, thereby improving organizational performance [10]. Green digital transformation and green innovation capabilities are crucial for overcoming hotels' operational bottlenecks and promoting green initiatives [11]. Research shows that organizations' green initiatives are a vital catalyst to attain sustainable development goals (SDGs) [12,13]. Green initiatives like paperless accounting and online reservations reduce hotel operational costs and improve sustainability performance through reduced carbon emissions [14]. In addition, digital transformation enhances a company's image through projecting the image of the company as a responsible corporate citizen and saves costs on energy and operational expenditures, increasing hotels' profitability [15,16].

Hotels implement digital technologies to improve sustainable operations, which, in turn, contribute to environmental sustainability [17,18]. Green digital transformation fosters green innovation capabilities, improves operational efficiencies, and enhances hotels' resilience [9,11,19]. Eco-friendly practices in the hospitality industry involve changes in procurement, production, operations, marketing, and the sale of tourist services [20]. Researchers argue that the implementation of digital technologies fosters sustainable practices in hotels [21,22]. Research shows that hotels' eco-friendly practices enhance organizational resilience and improve hotel performance [23,24]. Hotels' environmental management strategies have a profound impact on green operations and product development, which, in turn, significantly contribute to hotels' sustainable performance.

The extant literature has paid due attention to digital transformation and green innovation capabilities in the hotel industry [9,18,25,26]. However, the past literature is silent on how green digital transformation contributes to green dynamic capabilities and green innovation capabilities. In addition, the existing literature is silent and offers inconclusive evidence on how organizational resilience improves operational innovations (process and service) and leads to organizational performance. To address this void in the existing literature, this study aims to examine the influence of green digital transformation on green dynamic capabilities, green innovation capabilities, and organizational resilience. Furthermore, the study will evaluate how organizational resilience influences operational innovation (process and service) and organizational performance. Thus, this study will address the following research questions:

RQ1. *What is the impact of green digital transformation on green dynamic capabilities and green innovation capabilities?*

RQ2. *How do green dynamic capabilities and green innovation capabilities enhance organizational resilience?*

RQ3. *How does organizational resilience impact operational innovations (process and service) and organizational performance?*

The current research has several potential contributions. First, this is among the few studies that have emphasized how green digital transformation enhances green dynamic capabilities and green innovation capabilities. Therefore, this study will contribute to the theory by empirically developing the relationship between green digital transformation, green dynamic capabilities, and green innovation capabilities. Second, this study will examine the influence of green dynamic capabilities and green innovation capabilities on organizational resilience. Third, this study will advance theoretical understanding by examining the influence of organizational resilience on operational innovations (process and service) and organizational performance. Fourth, this study offers useful implications for hotel managers regarding the implementation of green technology to enhance hotel resilience, improve innovations, and organizational performance.

2. Literature Review and Development of Hypotheses

2.1. Theoretical Background: Dynamic Capability View (DCV)

The dynamic capability view (DCV) is a robust theoretical lens for examining the influence of green digital transformation (GDT) on organizational performance in the volatile and digitalized hospitality industry. The DCV is an extended version of resource-based view (RBV) theory due to its focus on the integration, reconfiguration, and renewal of resources to respond to environmental turbulence [27,28]. However, the RBV provides limited explanation of how firms adapt and reconfigure resources to achieve responsiveness in turbulent environments [29]. In contrast, the DCV is the pertinent theoretical framework in the context of digital disruption and sustainability transition [30]. Organizational innovation is pivotal to dealing with the challenges presented by the everchanging markets [31]. Another element is green dynamic capabilities, which are the modification of traditional dynamic capabilities by environmental concern. These capabilities include embedding green practices into strategic and operational frameworks for the systematic mobilization and reconfiguration of resources [32,33]. Prior studies have employed the DCV framework to assess organizational performance [33–35]. This is particularly silent in the hospitality sector, where green technology improves organizational resilience and fosters process and service innovation. The integration of green technology is pivotal to address environmental sustainability and improve hotels' operational efficiency [36]. Therefore, this study evaluates how green digital transformation influences green dynamic capabilities and green innovation capabilities and strengthens organizational resilience. Furthermore, it evaluates the influence of organizational resilience on process and service innovation, which are crucial for hotels' performance.

This study uses the DCV as a theoretical framework and conceptualizes green digital transformation as an antecedent that enables hotels to sense and respond to digital and environmental changes. In addition, green dynamic capabilities and green innovation capabilities mobilize, integrate, and reconfigure organizational resources which, in turn, strengthen organizational resilience. The study posits that organizational resilience is among the keys to reconfiguring outcomes that strengthen organizational operational capabilities and enhance process and service innovation for higher organizational performance. Thus, the proposed conceptual framework in Figure 1 reflects the DCV logic of sensing environmental and technological changes and seizing opportunities through capability development. Furthermore, it explains how organizational resilience and innovations help hotels to improve their performance.

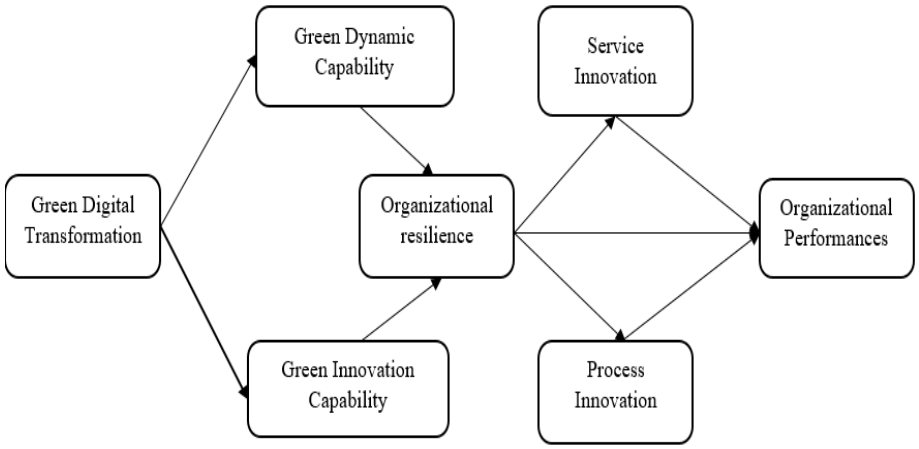


Figure 1. Research model. **Source:** authors' elaboration.

The study's conceptual framework is presented in Figure 1.

2.2. Green Digital Transformation

Green digital transformation incorporates the utilization of digital technologies to improve efficiency while taking into consideration green policies. This entails the adoption of digital frameworks to balance profitability with ecological concern in the form of energy and waste reductions [37,38]. Smart devices and systems in hotels facilitate the optimization of energy consumption [39]. These technologies offer valuable information and improve hotels' energy consumption measures. For instance, smart room technologies are employed to manage hotels' energy consumption [40]. These innovations in hotels help to manage energy consumption and enhance guest satisfaction levels [41].

The digital transformation, coupled with green technology, enables swift market adaptation to changing eco-friendly standards for businesses [42]. Technologies such as blockchain, the Internet of Things (IoT), big data analytics, and artificial intelligence automate and simplify processes like data collection, analysis, forecasting, and real-time decision-making, which increases organizations' dynamic capabilities [8,43,44]. In addition, these resources enable productive scheduling, combining the supply chain restriction border, reduction of supply risk, and inventory mismanagement within a single system. Such enhanced flexibility and adaptability are critical in responding to eco-friendly and market-driven changes [45]. Based on evidence from past studies, this study proposes that green digital transformation is critical to improving the agility and adaptability of hotels' supply chains. Hence, the following hypotheses are proposed:

H1. *Green digital transformation will positively associate with green dynamic capabilities.*

H2. *Green digital transformation will positively associate with green innovation capabilities.*

2.3. Green Dynamic Capabilities (GDCs)

Dynamic capabilities (DCs) represent an organization's capacity to create, integrate, and reconfigure competencies from diverse sources to address the challenges of a dynamic business environment [28]. DCs represent firms' ability to introduce new competencies to adapt to a dynamic environment. Research shows that adequate utilization and integration of resources into businesses ensure sustained resilience [46,47]. DCs offer real-time information to firms that helps them to make swift decisions during environmental uncertainties [48]. Research shows that DCs are crucial resources that significantly influence organizations' performance. For example, Bresciani et al. [49] posit that green dynamic capabilities significantly influence sustainable performance. Kähkönen et al. [50] posit that manufacturing, procurement, customer services, and delivery are crucial aspects of DCs that enhance organizational resilience. In the context of hotels, green dynamic capabilities (GDCs) are needed to withstand external shocks due to technological innovations [51]. GDCs improve operational service and maintain uniformity during uncertain events [19]. Based on prior studies' evidence, it is assumed that green dynamic capabilities will positively influence organizational resilience. Hence, the following is hypothesized:

H3. *Green dynamic capabilities will associate with organizational resilience.*

2.4. Green Innovation Capabilities (GINCs)

Innovation represents organizations' inclination to experiment and implement novel operational procedures [52]. GINC is an organization's ability and tendency to innovate novel green practices in organizational operations that improve its resilience. Rahman et al. [46] argue that GIN improves organizations' sustainability. GIN plays a critical role and helps organizations to achieve resilience and sustainability [17]. In other words,

during market turbulence, organizations with GINC are better positioned to deal with environmental uncertainties [25]. The existing literature offers a limited understanding of how green innovation capabilities improve hotels' resilience. Therefore, it is assumed that green innovation capabilities are a fundamental attribute of hotels that significantly enhance hotels' resilience. Hence, the following is proposed:

H4. *Green innovation capabilities will associate with organizational resilience.*

2.5. Organizational Resilience

Organizational resilience represents a firm's capacity to recover from setbacks and adapt to evolving market trends [53]. It enables organizations to restructure their internal processes during disruptions [54]. Resilient organizations can anticipate market changes and transform their assets to improve operational efficiency [55,56]. According to Garrido-Moreno et al. [57], resilient organizations learn from adversity and emerge stronger. The empirical findings indicate a strong relationship between organizational resilience and performance. Hence, the following is proposed:

H5. *Organizational resilience will positively associate with organizational performance.*

In addition, a resilient organization strives for continuous innovation and service delivery during environmental turbulence [58]. Organizational resilience functions as an anticipatory capability, enabling organizations to identify customer-centric demands [59]. Research shows that resilient organizations provide optimal customer service by adopting digital technologies [60,61]. In the digital era, organizations are better positioned to deliver innovative services that align with evolving market needs [62]. Empirical evidence from these studies shows strong association between organizational resilience and service innovation. Hence, the following is proposed:

H6. *Organizational resilience will associate with service innovation.*

Research shows that organizational resilience offers flexibility and improves and enhances organizational learning through the adoption of efficient practices [63]. Digital transformation facilitates continuous learning and development. A resilient organization easily anticipates market changes and utilizes assets to achieve competitiveness, survival, and greater performance [64,65]. Evidence from past studies has highlighted strong association between organizational resilience and process innovation. Thus, the following is proposed:

H7. *Organizational resilience will associate with process innovation.*

2.6. Service Innovation

Service innovation is a crucial strategic element that improves organizations' long-term sustainability. According to Feng et al. [66], service innovation is the superior value that strengthens firm positioning. Hanaysha et al. [67] found that service innovation improves business sustainability through customer engagement. Moreover, Garrido-Moreno et al. [68] highlight that the integration of digital tools and collaborative networks is an essential feature of service innovation that helps to achieve organizational sustainability. These studies highlight that service innovation is crucial to achieving an organization's long-term goals. Hence, the following is proposed:

H8. *Service innovation will positively associate with organizational performance.*

2.7. Process Innovation

Process innovation encompasses processes that enhance production efficiency, reduce waste, and optimize resource utilization [69]. It is the implementation of strategies that enables firms to achieve effectiveness and efficiency [70]. Process innovation includes the integration of green practices such as waste and energy reduction methods and the integration of eco-friendly facilities [20,71]. Ma et al. [72] argue that process innovation is an integral part of an organization's operations that ensures quality, reputation, and the business's long-term sustainability. Researchers highlight that process innovation is crucial for achieving cost efficiency and improving production processes, which eventually lead to higher business performance. Hence, the following is proposed:

H9. *Process innovation will positively associate with organizational performance.*

3. Methodology

3.1. Instrument

This study adapted measuring tools from prior studies. All scales were measured using a five-point Likert scale. Green digital transformation was measured using a four-item scale from Huang and Huang's [73] study. Green dynamic capabilities were measured using a four-item scale from Chen and Chang's [74] study. Green innovation capabilities were measured using a four-item scale from Sarwar et al.'s [75] study. Organizational resilience was measured using a five-item scale from Saemaldaher and Emeagwali's [76] study. Process innovation was measured using a five-item scale from Chatterjee et al.'s [77] study. Service innovation was measured using a three-item scale from Mennens et al.'s [78] study. Organizational performance was measured using a six-item scale from Zhang et al.'s [79] study. After designing the research instrument, researchers presented it to six managers working in two hotels to verify the content validity. Then, the survey instrument was administered to 45 participants for the pilot study. The results of the pilot study were satisfactory, as all items' loading scores were more than 0.60. Pilot study data were not included in the final dataset because they were collected during the initial phase of the research. The study retained all items from the pilot study for the final survey. The details of the measurement scale are shown in Table 1.

Table 1. Scale and measuring items.

Construct	Items	Sources
Green Digital Transformation	GDT1: Our hotel uses digital technology to sense green market opportunities	Huang and Huang [73]
	GDT2: Our hotel uses digital technology to seize green market opportunities	
	GDT3: Our hotel uses digital technology to reconfigure our business's green models	
	GDT4: Our hotel is based on digital technologies for green value creation	
Green Dynamic Capabilities	GDC1: Our hotel can monitor the environment and identify new green opportunities	Chen and Chang [74]
	GDC2: Our hotel can develop green technology	
	GDC3: Our hotel can organize employees for green technology	
	GDC4: Our hotel can manage resources for green innovation	

Table 1. *Cont.*

Construct	Items	Sources
Green Innovation Capabilities	GINC1: Our hotel's organizational culture promotes green innovation	Sarwar et al. [75]
	GINC2: Our hotel can utilize diverse knowledge to develop eco-friendly products efficiently	
	GINC3: Our hotel can swiftly adapt to market changes for green practices	
	GINC4: Our employees are actively engaged in the generation of eco-friendly ideas and sustainable product development	
Organizational Resilience	OR1: Our hotel has strong social connections	Saemaldaher and Emeagwali [76]
	OR2: Our hotel adapts easily to changing situations	
	OR3: The management of our hotel is optimistic during difficult times	
	OR4: The management of our hotel is calm in high-stress situations	
	OR5: The management of our hotel is confident in the abilities of employees to tackle problems	
Process Innovation	PRI1: Our hotel has improved process efficiency for managing knowledge to sustain competitiveness	Chatterjee et al. [77]
	PRI2: Our hotel's process innovation helps to improve international marketing knowledge management	
	PRI3: In our hotel, knowledge sharing drives process innovation by enhancing marketing knowledge management	
	PRI4: Our hotel's efficient process management complements firm performance	
	PRI5: Our hotel process innovation is improved by managing knowledge for the betterment of international marketing	
Service Innovation	SRI1: Our hotel's new services enhance performance	Mennens et al. [78]
	SRI2: Our customers experience new services as superior to our competitors' services	
	SRI3: Our hotel provides better customer solutions than our competitors	
Organizational Performance	OP1: Our hotel return on investment is high	Zhang et al. [79]
	OP2: Our hotel generates a high return on equity *	
	OP3: Our hotel is more profitable than our competitors	
	OP4: Our hotel sales growth is higher than that of our competitors	
	OP5: Our hotel revenue is higher than that of our competitors	
	OP6: Our hotel market shares are higher than those of our competitors	

Note: * indicates low factor loading and a removed item. **Source:** authors' elaboration.

3.2. Data Collection

This research is based on positivist philosophy, and a quantitative research design was used for data collection. A questionnaire survey was conducted with frontline managers working in the hotels. Data were gathered from Beijing, Shanghai, Chengdu, and Hangzhou because these cities are digitally advanced and have better hotel ecosystems. Top-level managers and frontline managers were approached because they engage in managing several daily operations. These employees represent an appropriate sample in hotels to make decisions on operational issues. For data collection, researchers formed four groups, each

with one PhD student and two master's students. These students were offered incentives, including a bonus, travel, and daily allowance. Data were collected from 15 December 2025 to 3 March 2026. The researcher followed a multidimensional approach to collect data from the participants, which included visiting hotels, searching websites, and contacting the HR department to facilitate data collection. In addition to this, research objectives were properly explained to the relevant manager, and they were apprised that this study is purely based on research and academic purposes; their identity would be kept anonymous. A total of 438 managers from 120 hotels were contacted, out of which 329 valid responses were received. There were 109 questionnaires that had missing values and outliers and were incomplete. Details of demographics are shown in Table 2.

Table 2. Demographic profile.

Categories	Description	Frequency	Percentage (%)
Age	20 to 25	38	11.6
	26 to 30	84	25.5
	31 to 35	75	22.8
	36 to 40	80	24.3
	Above 40 years	52	15.8
Gender	Male	215	65.3
	Female	114	34.7
Region	Beijing	92	28
	Shanghai	78	23.7
	Chengdu	85	25.8
	Hangzhou	74	22.5
Experience in years	Less than 3	14	4.3
	3 to 7	62	18.8
	8 to 10	154	46.8
	11 to 15	82	24.9
	More than 15	17	5.2
Position	Food manager	22	6.7
	Quality control manager	47	14.3
	Procurement manager	71	21.6
	IT manager	27	8.2
	Marketing manager	33	10
	Operation manager	48	14.6
	Others	81	24.6

Source: authors' elaboration.

4. Data Analysis

4.1. Analytical Tool

For data analysis, this study used SPSS 26 and SmartPLS 4.1.1 versions. For preliminary analysis, such as descriptive statistics and multivariate outliers, data analysis was performed on SPSS. For the assessment of common method bias through random variable, measurement, and structural model analysis, SmartPLS was employed. Researchers ensured that the collected data met the required minimum threshold for the final data analysis. Partial least squares (PLS-SEM) is an appropriate tool for the assessment of a structural equation model because it is suitable for theory building and analysis of complex models. First, the data were analyzed to ensure data reliability and validity through the measurement model, and then the structural model was tested for the verification of proposed hypotheses.

4.2. Preliminary Data Analysis

The data of this study underwent several preliminary analyses to ensure its suitability for further analysis. First, SPSS was employed to identify the missing values and outliers. Then, the random variable approach was used to assess the common method bias (CMB). In this approach, a variance inflation factor (VIF) less than 3.3 indicates that CMB is not an issue. The study's findings show inner VIF values for all constructs are less than 3.3, confirming that CMB is not an issue [80]. The values of VIF are shown in Table 3. In addition, CMB was confirmed through single-factor analysis. In this method, the variance for a single factor must be less than 50%. The findings confirmed that a single factor contributed to less than 50% variance in the data, which means the collected data is suitable for further analysis.

Table 3. Measurement model.

Constructs	Items	FL	VIF		α	CR	AVE	R^2	Q^2
			Outer	Inner					
Green Digital Transformation	GDT1	0.884	2.780	2.624	0.900	0.930	0.769		
	GDT2	0.902	2.902						
	GDT3	0.832	2.046						
	GDT4	0.888	3.123						
Green Dynamic Capabilities	GDC1	0.815	2.028	1.263	0.854	0.900	0.692	0.205	0.131
	GDC2	0.820	1.693						
	GDC3	0.795	2.166						
	GDC4	0.894	2.828						
Green Innovation Capabilities	GINC1	0.807	1.905	1.351	0.875	0.914	0.728	0.149	0.103
	GINC2	0.842	2.237						
	GINC3	0.883	2.578						
	GINC4	0.878	2.558						
Organizational Resilience	OR1	0.856	2.356	1.676	0.894	0.922	0.704	0.230	0.157
	OR2	0.867	2.479						
	OR3	0.749	1.634						
	OR4	0.875	2.835						
	OR5	0.843	2.555						
Process Innovation	PRI1	0.815	2.161	1.493	0.906	0.930	0.727	0.190	0.135
	PRI2	0.858	2.974						
	PRI3	0.862	2.623						
	PRI4	0.860	2.450						
	PRI5	0.869	3.200						
Service Innovation	SRI1	0.889	2.384	2.023	0.858	0.914	0.780	0.175	0.134
	SRI2	0.913	2.841						
	SRI3	0.846	1.853						
Organizational Performance	OP1	0.879	2.889	2.433	0.857	0.898	0.638	0.584	0.363
	OP3	0.786	2.011						
	OP4	0.816	2.167						
	OP5	0.746	1.645						
	OP6	0.759	2.166						

Note: FL = factor loadings, VIF = variance inflation factor, α = Cronbach's alpha, CR = composite reliability, AVE = average variance extracted. **Source:** authors' elaboration.

4.3. Measurement Model

To ensure data quality, we first evaluated internal consistency by calculating Cronbach's alpha values for each construct. All constructs exceeded the threshold value of ≥0.70,

indicating strong internal consistency [81]. In addition, we assessed internal consistency through composite reliability (CR) values, which exceeded 0.70, confirming data internal consistency. The measurement model also confirmed convergent validity, as all constructs' average variance extracted (AVE) were ≥0.50, and outer loadings were ≥0.70 [81]. Based on these criteria, AVEs for all constructs exceeded 0.50, and CR values exceeded 0.70, confirming convergent validity in the data. Table 3 shows the values of Cronbach's alpha, CR, and AVE for data internal consistency and convergent validity.

4.4. Discriminant Validity

Discriminant validity is a measure that shows the construct in the proposed model is unrelated to the others. Discriminant validity was evaluated using two criteria. According to Fornell and Larcker [82], the constructs' square of the average variance extracted (AVE) should be greater than its corresponding correlations. Table 4a displays the results of this analysis and confirms the presence of discriminant validity. According to the heterotrait-monotrait ratio (HTMT) criterion, the value of each construct should be less than or equal to 0.85 [83]. As shown in Table 4b, all construct values were below 0.85.

Table 4. (**a**) Discriminant validity analysis. (**b**) Discriminant validity through heterotrait-monotrait ratio (HTMT).

(**a**)							
Constructs	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Green Dynamic Capabilities	**0.832**						
Green Digital Transformation	0.452	**0.877**					
Green Innovation Capabilities	0.335	0.386	**0.853**				
Organizational Performance	0.347	0.697	0.392	**0.799**			
Organizational Resilience	0.365	0.597	0.415	0.538	**0.839**		
Process Innovation	0.280	0.596	0.362	0.655	0.436	**0.853**	
Service Innovation	0.321	0.654	0.405	0.640	0.418	0.551	**0.883**
(**b**)							
Constructs	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Green Dynamic Capabilities							
Green Digital Transformation	0.494						
Green Innovation Capabilities	0.392	0.426					
Organizational Performance	0.376	0.783	0.444				
Organizational Resilience	0.403	0.659	0.463	0.602			
Process Innovation	0.312	0.658	0.406	0.733	0.473		
Service Innovation	0.359	0.742	0.461	0.735	0.470	0.624	

Notes: The bold diagonal values refer to the square root of the AVE of each construct. All correlations are statistically significant ($p < 0.01$). **Source:** authors' elaboration.

4.5. Inner Model Predictive Power

In order to assess the fitness of the inner model, two methods were used: the coefficient of determination (R^2) and the predictive relevance of the model as indicated by the cross-validated redundancy (Q^2) [83]. The R^2 value represents the extent to which exogenous constructs explain variation in endogenous constructs. The R^2 value for the endogenous construct ranges between 14.9% and 58.4%, indicating low to moderately high predictive accuracy. The value of Q^2 was determined through the blindfolding method. In this, researchers compare the predicted and actual values to calculate the Q^2 value, which indicates the model's predictive relevance. A value above zero indicates the presence of predictive relevance in the model [84]. The results show that the coefficient value of Q^2 for

the endogenous constructs ranges between 0.103 and 0.363, indicating predictive relevance for the proposed model in this study.

4.6. Structural Model

This study's structural model was assessed using a 5000-resample bootstrapping method as illustrated in Figure 2. The conceptual model included nine hypothesized relationships. All hypotheses were supported, confirming the proposed model's robustness. Table 5 shows that H1 [GDT exerts a positive influence on GDC] and H2 [GDT exerts a positive influence on GINC] are supported: ($\beta = 0.452$; $t = 9.875$, $p < 0.05$) and ($\beta = 0.386$; $t = 8.080$, $p < 0.05$), respectively. These results show significant positive association between GDT and GDC and between GDT and GINC. H3 [GDC exerts a positive influence on OR] and H4 [GINC exerts a positive influence on OR] are supported: ($\beta = 0.255$; $t = 4.556$, $p < 0.05$) and ($\beta = 0.330$; $t = 5.476$, $p < 0.05$), respectively. These findings show significant positive association between GDC and GINC in enhancing organizational resilience. H5 [OR exerts a positive influence on SRI], H6 [OR exerts a positive influence on PRI], and H7 [OR exerts a positive influence on OP] are supported: ($\beta = 0.418$; $t = 8.784$, $p < 0.05$), ($\beta = 0.436$; $t = 10.466$, $p < 0.05$), and ($\beta = 0.237$; $t = 5.269$, $p < 0.05$), respectively. These findings indicate significant positive associations between OR and SRI, PRI, and OP. Finally, the results show that H8 [SRI exerts a positive influence on OP] and H9 [PRI exerts a positive influence on OP] are supported: ($\beta = 0.341$; $t = 7.002$, $p < 0.05$) and ($\beta = 0.363$; $t = 6.998$, $p < 0.05$), respectively. These results indicate that SRI and PRI are significantly and positively associated with OP.

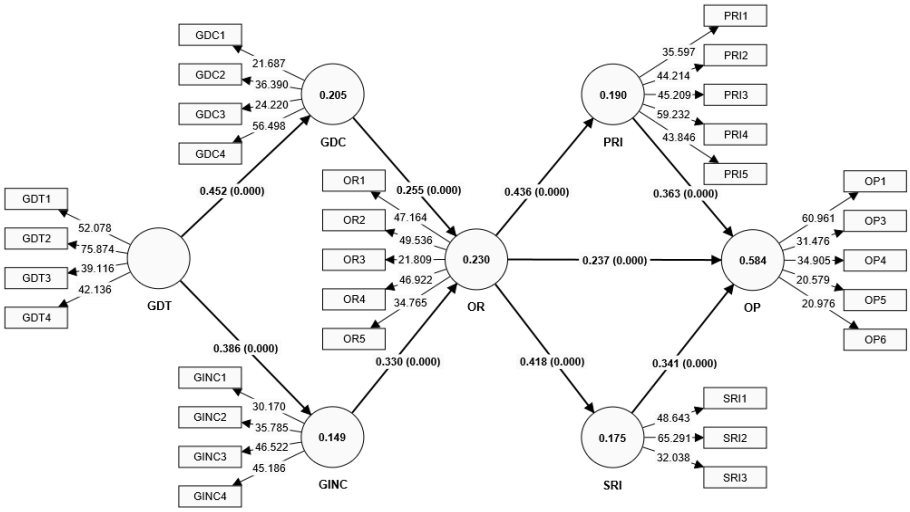


Figure 2. Structural model. **Source:** authors' elaboration.

Table 5. Hypotheses testing.

Hypotheses	Path Coefficients	T Values	*p* Values	f^2	Effect Size	Decision
H1: GDT -> GDC	0.452	9.875	<0.001	0.257	Medium	Supported
H2: GDT -> GINC	0.386	8.080	<0.001	0.175	Medium	Supported
H3: GDC -> OR	0.255	4.556	<0.001	0.075	Small	Supported
H4: GINC -> OR	0.330	5.476	<0.001	0.126	Small	Supported
H5: OR -> OP	0.237	5.269	<0.001	0.104	Small	Supported
H6: OR -> SRI	0.418	8.784	<0.001	0.212	Medium	Supported
H7: OR -> PRI	0.436	10.466	<0.001	0.234	Medium	Supported
H8: SRI -> OP	0.341	7.002	<0.001	0.184	Medium	Supported
H9: PRI -> OP	0.363	6.998	<0.001	0.205	Medium	Supported

Note: Results are significant at ($p < 0.05$). **Source:** authors' elaboration.

5. Discussions

The study's findings indicate that green digital transformation is significantly associated with hotels' green dynamic capabilities and innovation capabilities. These findings confirm that the use of digital technologies, such as artificial intelligence, data analytics, IoT, and energy monitoring, enhances hotels' capabilities to measure and reconfigure resources and offers innovative solutions [85,86]. The findings show that green dynamic capabilities improve organizational resilience by implementing green solutions to monitor environmental disruptions and overcome bottlenecks. The findings match with prior research that found that green dynamic capabilities play a role in improving organizational resilience [46,47]. The positive association between green innovation capabilities and organizational resilience was also confirmed, which signifies the importance of innovation capabilities in changing the macro-environment. Green innovation capabilities involve the implementation of digital technologies to monitor hotels' daily operations and suggest preventive measures for better utilization of resources. In the hotel context, green innovation capabilities enable organizations to translate environmental awareness and available knowledge into practical solutions such as the use of efficient energy technologies, implementing waste reduction practices and delivering environmentally responsible services. The findings corroborate with Rahman et al.'s [46] study, which argued that green innovation capabilities play a crucial role in enhancing organizational resilience. Furthermore, the findings show the positive influence of organizational resilience on service and process innovation. Resilience enhances organizational flexibility needed to sustain experimentation, redeploy resources, and implement changes despite uncertainty. These findings indicate that strong organizations can easily implement strategies that foster better service facilities and improve daily operations. Prior studies demonstrated that organizational resilience plays a pivotal role in offering better services and improving operational activities [58,59]. The positive association between organizational resilience and organizational performance was also significant. It indicates that the performance of hotels aligns with how well they understand market dynamics and overcome uncertainties that pose threats to their sustainability. Therefore, hotel managers must be vigilant to external developments such as the integration of novel technologies that could potentially reshape the organization's capabilities. The study's findings indicate significant association between service innovation and organizational performance, which matches with Hanaysha et al.'s [67] findings. The findings highlight that hotels' adoption of digital technologies improves customer service and enhances their performance. Finally, the study's results show that process innovation is significantly associated with organizational performance. This shows that the adoption of digital technologies improves hotel operations by improving smart resource management such as the energy and waste management efficiency of hotels.

6. Conclusions

This study proposed a novel conceptual framework that assessed the association of green digital transformation with green dynamic capabilities and green innovation capabilities. Furthermore, the study posits that green dynamic capabilities and green innovation capabilities play a crucial role in influencing organizational resilience, which, in turn, improves services and process innovation and organizational performance. Prior studies have recognized the significant role of digital technologies and green innovation in the hotel industry. However, studies remain limited in assessing the association of green digital transformation on green dynamic capabilities and green innovation capabilities. This study advances the literature by emphasizing the critical role of digital technologies and sustainability initiatives on innovation and organizational resilience. The data were collected from 329 hotel managers in China who had diverse experience in managing hotel

operations. PLS-SEM was used to analyze the proposed framework. The study's findings show that managers should spend more on eco-friendly digital technologies, such as energy-efficient technologies, waste management, and food upcycling technologies, to contribute to sustainability.

7. Theoretical Implications

This study offers several important theoretical contributions to the literature on dynamic capabilities, sustainability, and hospitality management by advancing the dynamic capabilities view (DCV) in the context of green digital transformation. This study advances the literature by focusing on the nexus between digital capabilities and sustainability in the context of the hotel industry. Specifically, this study contributes to the DCV by emphasizing the importance of green digital transformation. The extant literature emphasized sensing, seizing, and reconfiguring capabilities and ignored the significance of digitalization in the sustainability context. This study explores how digital transformation drives green dynamic capabilities and green innovation capabilities of the organizations. This study considers digital transformation as a strategic enabler of sustainability in the hotel industry. Second, the study empirically validates that green dynamic capabilities and green innovation capabilities are fundamentally critical factors that strengthen organizational resilience. This nexus highlights that green dynamic capabilities and green innovation capabilities are not only sustainability-focused, but these capabilities also enhance organizational risk aversion and adaptability to a dynamic macro-environment. Third, this study differentiates between service and process innovation. Although several past studies have focused on process and product innovation, the literature remains silent in the context of hotels. This study empirically linked organizational resilience with service and process innovations in hotels. The findings indicate that digital transformation affects innovations and performance. Finally, this study presents a novel framework that connects digital transformation, green dynamic capabilities and innovation capabilities, resilience, and performance. This comprehensive framework captures the complex relationships between digitalization, sustainability, innovation, and performance in the context of hotels.

8. Practical Implications

This research provides several actionable measures for hotel managers, policymakers, and sustainability practitioners regarding the implications of green digital transformation for organizational capabilities, innovation, and hotel performance. First, this study's empirical findings highlight the relevance of green digital transformation in the hotel industry and emphasize the strategic importance of green digital transformation in improving green dynamic capabilities, innovation capabilities, innovations and hotel performance. The findings indicate that green dynamic capabilities and innovation capabilities are strategic enablers that strengthen hotels' abilities to sense environmental threats and opportunities and optimize resource utilization through proactive measures. Digital transformation is a deliberate process that enhances organizations' dynamic capabilities and fosters cross-functional coordination in hotel operations. Therefore, hotel managers should consider the utilization of resources to develop and integrate key environmental performance indicators that promote a sustainable and innovative culture in the organization. In addition, managers should consider these efforts as risk management and resilience-building mechanisms to overcome market inflation and address customers' preferences for environmental sustainability. The results indicate that organizational resilience is fundamentally crucial for services and process innovation in hotels. In this regard, managers may introduce digital check-in systems, energy monitoring technologies, and personalized digital services for hotels seeking to integrate digitalization with operational and service improvements. In addition, hotels can

focus on digital check-ins, installing low-carbon technologies, and offering personalized services that improve customers' experiences. Hotels can improve processes and promote environmental sustainability through innovation by introducing water recycling technologies, waste minimization systems, and energy-efficient technologies. The findings also highlight the crucial role of service and process innovation in enhancing hotel performance. This highlights that a balanced strategy is required to overemphasize service innovation at the expense of back-end operations. Therefore, to improve hotels' reputation and enhance customer experience, managers can implement green services such as a key-card electricity system, the removal of single-use plastics, and eco-friendly toiletries. For back-end operations, hotels can promote the reduction of water waste, foster food upcycling, and train employees to use energy-efficient technologies. These initiatives improve processes, reduce the cost of operations, and enhance hotel efficiency. Finally, from the policy perspective, the study's findings highlight the importance of green digital transformation in enhancing hotel efficiency and overall organizational performance. Therefore, policymakers and the government should offer subsidies and incentives and improve the regulatory framework to support green digitalization in hotels.

9. Limitations and Future Research Scope

This research has some limitations that can be addressed in future studies. First, the data was collected from big cities in China, which limits its application to other countries. Therefore, future studies can collect data from other countries and assess the differences in their performance. In addition, future researchers can collect data from four- or three-star hotels and compare the performances of four-, five-, and seven-star hotels. Second, the study collected data from managers through a closed-ended questionnaire. It is possible that various underlying factors that could affect green dynamic capabilities and green innovation capabilities of hotels were ignored. Therefore, future studies can use a sequential mixed method to identify the main performance indicators. In addition, organizational performance was measured via managers' self-reporting of hotels' profitability, sales growth, revenue, and market share. Therefore, future researchers may use objective performance indicators and collect predictor and outcome measures from different sources. Though the study developed a novel framework, it is pertinent to assess the influence of moderating factors such as technological intensity, organizational culture, and digital leadership. The addition of moderating factors will improve the understanding of relationships in the proposed framework. Third, this study is cross-sectional, and data were collected at a single point in time, which limits the framework's ability to examine causal relationships over time. Future researchers can use a longitudinal research design to observe the relationships over a period of time. Finally, the study relies on purposive sampling and collected data from hotel managers, which may cause bias because the perspectives of other stakeholders were ignored. Future studies may include probability-based sampling to evaluate additional hotels from other geographical regions. In addition, future studies may consider contacting customers and employees to offer a balanced understanding of digital transformation and sustainability practices in hotels.

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