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Communicating digital responsibility: how trust signals shape consumer responses in tourism platforms

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Objective: In digital tourism environments, organizations must communicate trustworthiness under conditions of data vulnerability and limited face-to-face interaction. This study conceptualizes Digital Corporate Social Responsibility (DCSR) as a communication-based trust signal and examines how it shapes digital trust, corporate reputation, and consumer responses, while accounting for the moderating role of perceived data breach risk.
Methods: Data were collected through an online survey of 437 domestic and international tourists who interacted with digital platforms of tourism companies in Serbia. Structural equation modeling (PLS-SEM) was employed to examine the relationships among DCSR, digital trust, corporate reputation, and consumer behavioral responses (loyalty, advocacy, and willingness to share personal data). Moderation analysis was conducted to assess the role of perceived data breach risk, and conjoint analysis was used to identify the relative importance of specific DCSR communication practices.
Results: The findings indicate that DCSR functions as a significant communication signal, are positively associated with digital trust, corporate reputation, and consumer responses. However, the perceived risk of sensitive data breaches substantially weakens these effects, suggesting that trust-building signals lose persuasive strength in high-risk digital environments. Consumers assign the highest value to communication practices directly related to transparency, cybersecurity, and control over personal data, while broader sustainability-oriented initiatives are perceived as less immediately relevant for digital trust formation.

Conclusion: The study demonstrates that digital corporate social responsibility operates as a communication mechanism through which organizations signal credibility, integrity, and accountability in digital tourism settings. However, the effectiveness of these signals is conditional upon the perceived security of the communication environment. By highlighting how trust is communicatively constructed and disrupted under risk, the findings contribute to research on digital communication, signaling processes, and trust formation in data-sensitive service contexts.

KEYWORDS

data breach risk, digital communication, digital corporate responsibility, digital trust, signaling theory, tourism platforms

1 Introduction

The digitalization of the tourism sector has redefined how services are delivered, consumed, and how trust is communicated in the absence of face-to-face interaction (Collins, 2024; Perinotto et al., 2022). Online booking systems, mobile applications, and AI-driven personalization have improved convenience, but simultaneously increased exposure to cybersecurity threats and sensitive data breaches (Florido-Benítez, 2024a; Joshi et al., 2024). In simple terms, these signals help users decide whether a platform is safe to use and whether their personal information is protected. However, these signals operate under conditions of heightened uncertainty, where risks related to data privacy and security can undermine their effectiveness. High-profile breaches in major hotel chains and airlines have demonstrated how failures in digital communication and data governance can damage trust, corporate reputation and lead to long-term financial relational consequences (Fakfare et al., 2024; Florido-Benítez, 2024b; Yu et al., 2022). Corporate Social Responsibility (CSR) has long been recognized as a trust-building mechanism in offline contexts (Xie and Dai, 2025). However, in digital tourism, the traditional CSR focus on environmental sustainability or philanthropy is insufficient to address data privacy concerns (Jones and Comfort, 2021). This has led to the emergence of Digital Corporate Social Responsibility (DCSR), which refers to organizational practices and communication strategies aimed at ensuring ethical, transparent, and accountable use of digital technologies, particularly in relation to data privacy, security, and user rights (Jelovac et al., 2022; Okazaki et al., 2020). Beyond being a set of practices, DCSR can be understood as a form of strategic communication through which organizations signal competence, integrity, and benevolence in digitally mediated exchanges.

While DCSR builds upon the broader principles of traditional CSR, it represents a conceptually distinct form of responsibility shaped by digitally mediated environments. Traditional CSR is typically expressed through tangible actions such as environmental initiatives, community engagement, or ethical labor practices, which stakeholders can directly observe or experience. In contrast, DCSR operates primarily through communication and information systems, where users must rely on organizational signals to evaluate responsibility. Moreover, DCSR specifically addresses digital-specific challenges, including data privacy, cybersecurity, algorithmic transparency, and user control over personal information. As a result, responsibility in digital contexts is less about visible actions and more about how these actions are communicated, interpreted, and trusted by users in environments characterized by high uncertainty and limited direct interaction. This distinction highlights that DCSR is not merely an extension of CSR into digital channels, but a transformation of responsibility into a communication-driven mechanism of trust formation (Al-Omoush et al., 2024). This is particularly relevant in tourism industry since it represents a trust-intensive industry where transactions involve sensitive personal information and where consumer decisions are shaped by perceived credibility and reliability of digital platforms (Elshaer et al., 2024; Rather and Sharma, 2017).

Theoretical research on DCSR in the travel and tourism sector still remains fragmented, despite its importance. The majority of studies has focused on CSR from a wide viewpoint, frequently highlighting its environmental and physical aspects, such as community involvement and sustainable operations (Ahmad et al., 2023), while paying limited attention to how responsibility is communicated in digital contexts. As digital platforms increasingly mediate consumer interactions, understanding how organizations communicate trustworthiness becomes critical. Although prior research has examined the role of transparent communication and ethical data practices in enhancing trust and loyalty in sectors such as retail (Ailawadi et al., 2014; Okazaki et al., 2020; Wirtz et al., 2022), comparable insights in tourism remain limited, despite the sector's heightened dependence on trust due to the sensitive nature of personal data exchanged during service transactions (Ioannou et al., 2020; Stocker et al., 2023). Moreover, insufficient attention has been given to the conditions under which DCSR communication signals succeed or fail. In particular, the role of perceived data breach risk remains underexplored (Buhalis and Leung, 2018). While prior studies suggest that ethical crisis communication and proactive transparency can mitigate the negative effects of data breaches (Chen and Jai, 2019; Dutot and Bergeron, 2016; Hassan and Ahmed, 2023), it is unclear to what extent DCSR can sustain trust when consumers perceive high levels of digital risk.

The growing body of research demonstrates that digital trust has become a critical determinant of consumer decision-making across multiple digital contexts, including tourism, e-commerce, and social media platforms (Hasan and Mayr, 2026; Khan et al., 2025; Martins et al., 2025; Mattathil et al., 2026). Recent studies further confirm that digital trust plays a central role in shaping

consumer engagement and behavioral outcomes in digital environments (Alhumud et al., 2025; Islam, 2026). Evidence indicates that perceived vulnerability to data breaches can significantly weaken digital trust, defined as users' confidence in an organization's ability to reliably, securely, and ethically manage digital interactions and personal data. Also, it can damage corporate reputation (Srinivas and Liang, 2022), raising questions about the conditional effectiveness of DCSR as a communication mechanism. In practical terms, this means that when users book a hotel or travel online, their willingness to trust a platform depends not only on the service offered, but also on how clearly the company communicates what happens to their personal data. In digitally mediated environments, these two concepts are closely interconnected, as DCSR functions as a communication mechanism through which digital trust is constructed. Beyond tourism, studies in digital marketing and e-commerce contexts similarly highlight the importance of trust and transparency in influencing consumer engagement and data-sharing behavior (Alhumud et al., 2025).

This gap highlights the need to move beyond examining direct effects and toward understanding how communication signals operate under varying levels of perceived risk. Accordingly, this study addresses the following research questions:

- How does DCSR, as a communication-based signal, shape digital trust, corporate reputation, and customer responses in tourism contexts?
- Do these relationships operate differently in high-risk digital environments, such as tourism platforms where personal and financial data are highly sensitive?
- Can DCSR mitigate the negative effects of perceived digital risk, or are its trust-building effects conditional upon the communication environment?

Answering these questions is vital because digital tourism platforms not only manage sensitive consumer data but also rely heavily on repeat purchases, word-of-mouth communication, and long-term relationships, making the consequences of mistrust particularly damaging (Elshaer et al., 2024; Meenakshy et al., 2024). Moreover, the tourism industry differs from other sectors in its reliance on emotional engagement, experiential services, and cross-cultural consumer interactions, all of which amplify the importance of credible and transparent communication in digital settings. This study is conducted in Serbia, which represents a high-risk, high-trust setting, since it is an emerging tourism destination with rapid digitalization but relatively lower consumer digital literacy and weaker regulatory enforcement compared to Western Europe. Serbia represents a particularly relevant context for examining digital trust and corporate responsibility in tourism platforms. As a transition economy with rapidly expanding digital services, it is characterized by increasing adoption of online tourism platforms alongside ongoing concerns related to data protection, institutional effectiveness, and cybersecurity (Bradić-Martinović, 2023; Cimbaljević et al., 2024). Prior research on emerging and post-transition economies suggests that such environments often exhibit a coexistence of relatively high reliance on platform-based interactions and elevated perceptions of risk, particularly regarding personal data use and digital transactions (Dinev and Hart, 2006; Florido-Benítez, 2024b; Ioannou et al., 2020; Srinivas and Liang, 2022). This combination creates a context in which trust is not taken for granted but must be actively constructed through communication signals. Consequently, Serbia provides a theoretically meaningful setting for examining how DCSR communication influences trust formation and consumer responses under conditions of perceived risk. In such contexts, communication-based trust signals are likely to play a more prominent role compared to highly institutionalized environments where trust is more strongly embedded in formal systems. This context enables a nuanced examination of how communication signals of responsibility operate when trust is both fragile and necessary.

To address these gaps, this research investigates how DCSR, conceptualized as a communication-based trust signal, is associated with digital trust (DT), corporate reputation (CR), and customer responses such as loyalty, advocacy, and willingness to share personal data within the tourism perspective. It further examines the moderating role of perceived data breach risk and explores consumer preferences for specific DCSR communication practices. By doing so, the study makes three key contributions. First, it advances research on digital communication by conceptualizing DCSR as a signaling mechanism through which organizations communicate trustworthiness in data-sensitive environments. Second, it extends CSR theory into digitally mediated service contexts, demonstrating how the effectiveness of responsibility signals is contingent upon perceived risk. Third, it provides context-specific insights into tourism, highlighting how trust is communicatively constructed and disrupted in a high-risk, high-trust setting. Together, these contributions offer both theoretical and practical implications for understanding communication, trust formation, and organizational responsibility in digital environments.

2 Related work

Corporate Social Responsibility (CSR) is widely understood through the lens of stakeholder theory (McKnight et al., 2002), which emphasizes that organizations must act responsibly toward all stakeholders to maintain legitimacy, trust, and long-term success. In traditional, offline contexts, CSR initiatives such as environmental sustainability, philanthropy, or ethical labor practices have been shown to strengthen stakeholder trust and corporate reputation (Ahmad et al., 2023). However, within the digital transformation era, these traditional forms of CSR are insufficient to address the communicative challenges associated with online interactions, particularly those related to data privacy, transparency, and cybersecurity. This has led to the emergence of Digital Corporate Social Responsibility (DCSR). In digital tourism environments, trust is not only an outcome but a process that is communicatively constructed in the absence of direct interpersonal interaction. Trust-based models (Amankona et al., 2024; Gefen et al., 2003) argue that digital trust is built on perceptions of competence, integrity, and benevolence. DCSR initiatives function as intentional communication signals that convey these dimensions: transparent data

policies communicate competence, proactive breach notifications signal integrity, and enabling user control over personal data reflects benevolence (Spence, 1973). Through this lens, DCSR can be seen as a communication mechanism through which organizations attempt to reduce uncertainty and shape consumer perceptions of trustworthiness in digital tourism platforms.

Beyond trust, organizations also seek to reduce information asymmetry between themselves and consumers, especially in digital environments where customers cannot easily evaluate a company's true commitment to security. Signaling theory (Fombrun et al., 2000) provides a useful framework for understanding this process. Firms communicate their trustworthiness through visible and credible signals, such as independent cybersecurity certifications, transparent privacy policies, or third-party audits. In tourism, where services are experiential and often purchased remotely, such communication signals become even more important for reducing uncertainty and encouraging consumer engagement (Collins, 2024). DCSR, therefore, operates as a strategic signaling mechanism that shapes how consumers interpret organizational credibility and ethical intent. These communication processes are closely linked to reputation theory (Al-Banna et al., 2023), which suggests that consistent and authentic responsible practices create a positive corporate image over time. In digital tourism environment, corporate reputation becomes an important as both an outcome of communicated responsibility and a key interpretive lens through which consumers evaluate organizations. Conversely, communication failures, especially in a form of data breaches, can quickly erode these positive outcomes (Chen and Jai, 2019). Thus, reputation acts as both a consequence of DCSR communication and a strategic resource that is associated with long-term customer relationships. To ensure conceptual clarity, the theoretical framework distinguishes the specific roles of each perspective in explaining the DCSR-trust-behavior process. Stakeholder theory provides the normative foundation by explaining why organizations engage in responsible digital practices, thereby defining the source of DCSR signals. Signaling theory explains how these practices are translated into observable and communicable cues that reduce information asymmetry in digital environments. Trust theory clarifies how these signals are interpreted by consumers, shaping perceptions of competence, integrity, and benevolence that form digital trust. Finally, reputation theory explains how consistent and credible signals accumulate over time to influence broader evaluative judgments and downstream behavioral outcomes. This structured integration allows for a process-oriented understanding of how DCSR communication signals originate, are interpreted, and ultimately is linked to consumer responses.

Bringing these perspectives together, the theoretical framework of this study conceptualizes DCSR as a communication-based trust signal that shapes digital trust, corporate reputation, and consumer responses. However, these positive effects are not unconditional. When consumers perceive a high risk of data breaches, the credibility and persuasiveness of DCSR communication may weaken, limiting its ability to generate trust and positive behavioral outcomes (Chen and Jai, 2019, Fakfare et al., 2024). The conceptual framework and all the proposed hypotheses are illustrated in Figure 1.

2.1 Hypotheses development

The hypotheses are developed with specific consideration of the characteristics of digital tourism platforms, where uncertainty, experiential consumption, and data sensitivity shape how communication signals are interpreted. Although digital trust and corporate reputation are closely related, they represent conceptually distinct constructs. Digital trust refers to a user's confidence in a platform's ability to manage digital interactions securely, reliably, and transparently, particularly in relation to data handling and online transactions. In contrast, corporate reputation reflects a broader, cumulative evaluation of an organization's credibility, integrity, and overall standing, shaped by both direct experiences and indirect signals such as communication, reviews, and public perception. While digital trust operates at the level of specific user-platform interactions, corporate reputation functions at a more general organizational level, influencing longer-term perceptions and evaluations. This distinction is important, as it suggests that DCSR communication signals may simultaneously affect immediate trust in digital interactions and broader reputational judgments, which in turn shape different aspects of consumer behavior.

In digital tourism platforms, where users must make decisions based on limited direct experience and often share sensitive personal and payment information, trust becomes a critical mechanism for reducing uncertainty. In such contexts, DCSR communication signals serve as key indicators of platform reliability and data responsibility. Prior research indicates that DCSR communication plays a key role in shaping digital trust by signaling transparency, competence, and ethical responsibility (Jelovac et al., 2022; Okazaki et al., 2020). In digitally mediated environments, such signals reduce uncertainty and enhance users' confidence in organizational practices. While a positive correlation is determined, the effectiveness of such communication signals may vary depending on industry context and consumer expectations. For example, Naumov et al. (2024) found that tech companies' DCSR efforts build more trust than those in traditional industries such as manufacturing. This suggests that customers might expect more from DCSR in fields that is linked to their online experiences. While uncommon, certain studies report conflicting findings. Ailawadi et al. (Ailawadi et al., 2014) reported that putting too much focus on DCSR when customers don't see clear benefits, can make them doubt and trust less. While existing studies offer valuable insights, the exploration of this topic within the tourism industry is relatively limited. Few studies, such as Elshaer et al. (202 4) and Perez and del Bosque (2015), highlight the vital importance of digital trust in maintaining profitable customer relationships. On this basis, the following hypothesis was formulated:

> H1. Perceived DCSR communication signals is positively associated with Customer Digital Trust (DT).

DCSR communication also contributes to corporate reputation by shaping stakeholders' perceptions of organizational credibility and integrity (Capriotti and Moreno, 2007; Kim et al., 2017). In digital tourism contexts, where interactions are mediated and information asymmetry is high, such communication signals

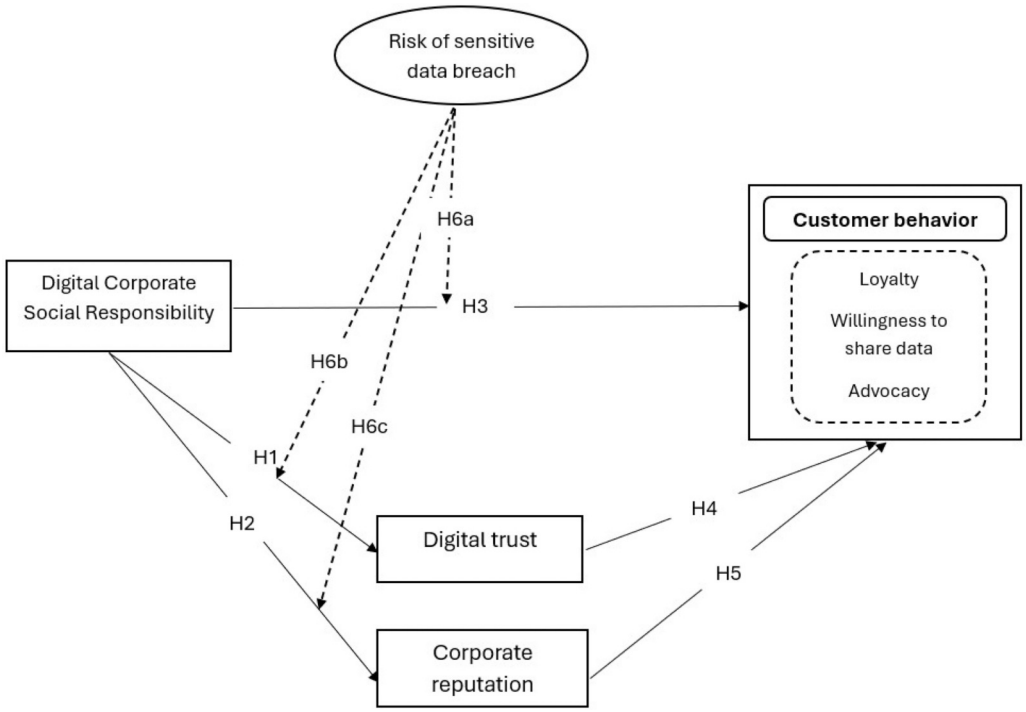

FIGURE 1
Conceptual framework illustrating the hypothesized relationships between digital corporate social responsibility (DCSR), digital trust (DT), corporate reputation (CR), and customer behavior (loyalty, advocacy, and willingness to share data), including the moderating role of perceived data breach risk.

become particularly influential. Kim et al. (Chu et al., 2020) noted that in sectors facing high public scrutiny, like finance and energy, the reputation benefits from CSR communication efforts are more significant compared to industries such as technology, where innovation often takes precedence over CSR. The link between DCSR and CR in the tourism sector is becoming more acknowledged. While some studies stress the significance of social media engagement in promoting corporate responsibility (Buhalis and Sinarta, 2019), others point out the necessity of clear and verifiable digital disclosures (Puriwat and Tripopsakul, 2021). Reputational evaluations in digitally mediated service environments are shaped not only by firm-controlled communication but also by platform dynamics such as user-generated content, ratings, and indirect interactions. In such settings, DCSR communication signals contribute to how organizations are perceived in terms of credibility, responsibility, and transparency, particularly when users must rely on mediated information to form judgments. Emphasizing the need to further investigate their relationship in tourism industry, the next hypothesis was proposed:

H2. Perceived DCSR communication signals is positively associated with Corporate Reputation (CR).

In the context of digital tourism platforms, customer behavior can be understood as a multidimensional construct encompassing different forms of user responses to trust and organizational signals. Specifically, loyalty, advocacy, and willingness to share personal data represent complementary behavioral outcomes that reflect varying degrees of user engagement and confidence. While loyalty captures continued usage intentions, willingness to share personal data reflects transactional trust in digital interactions, and advocacy represents a more proactive and relational form of engagement through recommendation and endorsement. Taken together, these dimensions provide a more comprehensive understanding of how users respond to DCSR communication signals, capturing both transactional and relational aspects of behavior in digitally mediated environments.

Unlike many digital products, tourism services are experiential, high-involvement, and often involve financial and personal risk. As a result, users are particularly sensitive to signals that indicate trustworthiness and responsible data practices. By fostering a sense of trust and consistency with the company's values, digital CSR communication enhanced consumer loyalty intentions (Amankona et al., 2024). Similar to this, customers are more ready to share personal information when digital CSR communication campaigns, particularly those that prioritize sustainability and transparency, are viewed as an indication of moral and responsible corporate practices (Jose et al., 2018; Kucukusta et al., 2019). However, Sung and Lee (2023) discovered that when digital CSR communication initiative is viewed as shallow or solely profit-driven, it may occasionally fall short of becoming advocacy. Studies in tourism reveal that digital CSR communication can significantly be associated with customer behavior, although the sector's unique characteristics, such as high reliance on experiential services and customer trust, yield distinctive insights. Rather and Sharma (2017) emphasized that CSR communication that emphasize sustainability and community involvement build confidence and motivate clients to share personal information. Pietrzak and Takala (2021), on the other hand, discovered conflicting findings, indicating that although CSR communication that

prioritize environmental sustainability are highly favored by eco-aware travelers, their impact on their willingness to share data is less pronounced, particularly among those who are worried about data privacy. Since communication signals have important role in tourism, the following hypothesis was proposed:

H3. Perceived DCSR communication signals are positively associated with Customer Behavior (CB) - advocacy, willingness to share data, and loyalty intention.

Jin et al. (2024) systematic review emphasizes that building digital trust is crucial to developing solid client connections and promoting data sharing in the digital economy, where interactions frequently take place without in-person contact. Nonetheless, there are also some contradictory results in the literature. According to Dutta et al. (2021), consumers frequently become more price-sensitive during recessions, which reduces brand loyalty as they look for better offers. This behavior emphasizes how consumers may communicate brands in search of better value due to financial factors, even after digital trust has been created. With little empirical data unique to tourism contexts, the majority of research, however, concentrates on trust as a moderating factor (Agarwal et al., 2015; Srivastava et al., 2022). Since this knowledge gap is especially noticeable when it comes to how digital trust dynamics impact lobbying and data-sharing practices in the particular trust-intensive tourism environment, the following hypothesis was put forth:

H4. Customer Digital Trust (CDT) is positively associated with customer behavior, i.e., customer loyalty, willingness to share personal data, and advocacy behaviors.

Corporate reputation also functions as a critical interpretive mechanism linking communication signals to consumer behavior. According to Esenyel and Emeagwali (2019), satisfied customers with high regard for a company exhibit stronger intentions to recommend its products or services. This result is consistent with Laufer and Coombs (2006) research, which found that a company's reputation encourages favorable word-of-mouth communication among users of digital platforms. Studies on people's willingness to share personal data, however, yield more complex findings. Customers are more likely to trust reputable companies with their data, according to Park et al. (2014), however, Martinez Garcia de Leaniz et al. (2024) warned that this trust does not always convert into a readiness to disclose sensitive information, especially in sectors where data breaches have occurred in the past. This discrepancy implies that although company reputation plays a significant role, its impact on consumer data-sharing behavior is mediated by other factors. To further analyze this relationship, the next hypothesis was proposed:

H5. Corporate reputation is positively associated with customer behavior, i.e., customer loyalty, advocacy, and willingness to share personal data.

The tourism context further amplifies the role of perceived risk, as users frequently engage in transactions involving personal, financial, and travel-related data. This makes the effectiveness of DCSR communication signals conditional upon the perceived security of the platform. The effectiveness of DCSR communication signals may depend on the broader communication environment, particularly the perceived risk of data breaches. From a tourism perspective, empirical studies confirm that data breaches significantly erode trust and satisfaction, diminishing the behavioral benefits of prior CSR communication efforts (Chen and Jai, 2019; Florido-Benítez, 2024a). Further, the impact of DCSR communication on corporate reputation also exhibits similar patterns. Research indicates that a single data breach can undo years of corporate social responsibility commitment and have damaging impact on visitor confidence and brand advocacy (Chen and Jai, 2019). Although a number of research indicate that the beneficial effects of DCSR communication on customer behavior, other studies present opposing views. Confente et al. (2019) found that although tourists' willingness to share data is reduced when they perceive risk, this effect is less pronounced for businesses that use consistent CSR messaging because trust in CSR communication can partially offset the negative effects of breaches. Buhalis and Leung (2018) observed mixed results in the tourism industry, indicating that while risk-averse visitors remain skeptical, technologically aware travelers can regain trust after a compromise thanks to DCSR communication initiatives including openness and real-time updates. Regardless of DCSR communication, the majority of research highlight the harm breaches do to one's reputation (Yang et al., 2025). Nonetheless, Dutot and Bergeron (2016) discovered that businesses with outstanding CSR communication performance are able to preserve favorable opinions even following a breach since stakeholders tend to blame outside forces rather than internal negligence. From a communication theory perspective, the effectiveness of DCSR communication signals depends not only on their content, but also on how they are received and interpreted by users. Perceived data breach risk can alter this interpretation process by increasing skepticism and reducing the perceived credibility of organizational messages. When users perceive a digital environment as insecure, they are more likely to question the reliability of communicated signals, interpret them as incomplete or strategically motivated, and discount their trust-building value. In this sense, perceived risk functions as a form of "communication noise" that interferes with signal transmission, reducing the clarity and persuasiveness of DCSR messages. As a result, even strong signals of responsibility may fail to generate trust and positive behavioral responses under conditions of heightened perceived risk. This highlights that trust formation in digital environments is not solely signal-driven, but also dependent on the perceived reliability of the communication context. Based on all of these insights, the following hypotheses are proposed:

H6a. Perceived risk of sensitive data breaches negatively moderates the relationship between DCSR communication signals and CB.

H6b. Perceived risk of sensitive data breaches negatively moderates the relationship between DCSR communication signals and DT.

H6c. The perceived risk of sensitive data breaches negatively moderates the relationship between DCSR communication signals and CR.

3 Methods

3.1 Sample and procedure

The survey distribution followed a structured multi-step process to ensure consistency and replicability. First, the questionnaire was designed and adapted to the tourism digital platform context. Second, it was distributed through multiple online channels, including email invitations, social media groups (e.g., travel-related Facebook and LinkedIn communities), and online travel forums. Third, respondents were screened based on eligibility criteria, requiring prior interaction with digital tourism platforms within the specified time period. Fourth, responses were monitored and cleaned by removing incomplete or inconsistent entries. Finally, the validated dataset was prepared for statistical analysis. This step-by-step approach ensures transparency and enables future studies to replicate the data collection procedure.

Both domestic and foreign travelers who engaged with the digital platforms of Serbian tourism companies were included as the target group. These platforms comprised websites for tour operators, hotel hospitality platforms, and internet booking services like *Booking.com Serbia* and *Airbnb Serbia*. The survey was available in two languages to account for the target population's diversity: English for internationals and Serbian for domestic travelers. Participants have utilized digital services offered by Serbian travel agencies between January 2025 and July 2025 in order to be eligible. A structured web-based survey instrument was employed for data collection, and it was disseminated via email, social networking sites (such as Facebook travel groups and LinkedIn), and forums devoted to travel (like TripAdvisor Serbia forums). Respondents were instructed to select a Serbian tourism company with which they had recently interacted through a digital platform. We did not limit responses to a single brand; instead, participants answered in reference to a specific company of their own choice, which reflects naturalistic perceptions of DCSR communication signals and digital trust. To address variability among companies and reduce potential bias, respondents were asked to specify the tourism company or platform they had in mind when completing the survey. This information was used to construct control variables capturing platform type (e.g., hotel, travel agency, online booking platform) and brand familiarity. These controls were included in the analysis to account for potential heterogeneity across service contexts. To assess the potential impact of platform heterogeneity, robustness checks and subgroup analyses were conducted. Specifically, we examined whether structural relationships differed across platform types and levels of brand familiarity. The results indicated no statistically significant differences in path coefficients across subgroups, suggesting that the model is stable and that the relationships between DCSR, trust, reputation, and consumer responses are consistent across different tourism platform contexts.

Overall, 454 responses were received, of which 437 were valid after removal of incomplete or inconsistent responses. The adequacy of the sample size ($n = 437$) was evaluated in accordance with established guidelines for Partial Least Squares Structural Equation Modeling (PLS-SEM). Following the "10-times rule", which recommends that the minimum sample size should be at least ten times the maximum number of structural paths directed at any construct in the model, the required sample size for this study was substantially exceeded. In addition, recent methodological recommendations suggest that PLS-SEM models with medium effect sizes ($f^2 = 0.15$) and a significance level of 0.05 require sample sizes well below the present sample to achieve statistical power above 0.80. Therefore, the sample size used in this study is considered sufficient to ensure robust and reliable estimation of the structural model.

The respondents included both domestic (58%) and international tourists (42%), ensuring a diverse representation of users of digital services. The sample was gender-balanced, with 55% female and 45% male participants. Regarding age distribution, the majority of respondents were aged 25–34 (35%), followed by the 35–44 group (25%) and those aged 18–24 (20%). The majority of participants held an undergraduate degree (45%) or a postgraduate degree (37%). Regarding the frequency of digital service use, 40% of respondents used digital tourism services 3–5 times, while 30% reported using them either 1–2 times or more than 5 times in the past year.

3.2 Instruments

The study employed validated measurement scales to capture respondents' perceptions of digital corporate responsibility, trust, reputation, and behavioral responses within digitally mediated tourism interactions. To enhance transparency and facilitate replication, the full list of measurement items, along with their original sources and adapted wording for the tourism platform context, is provided in Appendix A.

Digital CSR was operationalized using the instrument developed by McKnight et al. (2002). In total, 24 items that span into six dimensions were used: digital transparency (seven items, with a sample item - "Tourism company should inform users about the location, duration and rules of data storage"), digital privacy (five items, with a sample item - "Users have the right to access and modify personal data"), digital quality (three items, with a sample item - "The tourism company shall ensure that the digital products or services provided are reliable"), digital remedy (three items, with a sample item - "Tourism company shall specify the period and scope of maintenance"), and digital accessibility (three items, with a sample item - "Tourism company should ensure that websites and applications are easy to navigate and use for all users"). These items capture how organizations communicate responsibility and accountability through digital practices (e.g., transparency of data use, clarity of policies, and system reliability).

The Trusting Beliefs scale from Keh and Xie (2009) was used for assessing customer digital trust. This scale captures users' perceptions of a company's trustworthiness based on five question items (sample item: "I believe that the tourism

company has the resources to carry out digital activities"). Corporate reputation was measured using the scale of Evanschitzky et al. (2012) reflecting respondents' overall evaluation of organizational credibility and standing. It contains three items (sample "The tourism company is highly respected in terms of corporate digital responsibility"). A four-item scale was used to measure the risk of sensitive data breach construct, assessing customer concerns regarding the potential for unauthorized access or misuse of their personal data. The scale integrates items from Dinev and Hart (2006), with a sample item: "I worry that my personal information submitted to tourism company's platform could be made available to unknown individuals or companies without my knowledge".

Loyalty was measured using a three-item scale adapted from Malhotra et al. (2004), focusing on customers' intentions to continue using the company's services. A sample item from the scale was: "This tourism company is my first choice when it comes to purchasing digital tourism products". Willingness to share personal data was measured using a five-item scale adapted from Grande et al. (2022) and Maxham and Netemeyer (2002). The items assess respondents' willingness to disclose personal information in digital environments in exchange for service benefits. All items were adapted to the tourism digital platform context. The sample item was: "I am willing to share my travel preferences and past booking data". The advocacy construct included three items measuring the extent to which customers are ready to actively promote or defend a company to others. The scale is adapted by Elliot and Copilah-Ali (2024), with a sample item: "I would recommend this tourism company digital tourism services to my friends and family". All scales used a 5-point Likert scale for responses (1-strongly disagree, 5-strongly agree) and were adapted to reflect interactions within tourism digital platforms.

All measurement scales were adapted to the specific context of digital tourism platforms. This involved minor wording modifications to ensure relevance to tourism-related digital interactions (e.g., replacing general terms such as "company" or "service" with "tourism platform" or "tourism company"). Items were also contextualized to reflect common user experiences, such as online booking, sharing travel-related personal data, and interacting with platform-based services. To ensure clarity and content validity, the adapted questionnaire was pre-tested with a small group of respondents familiar with digital tourism services, and minor adjustments were made based on their feedback. These adaptations ensured that the original constructs were preserved while enhancing contextual relevance and interpretability.

In addition, respondents were asked to evaluate 20 individual DCSR initiatives within seven categories developed by Hair et al. (2021) (purpose and trust, fair and equitable access for all, promote societal wellbeing, consider economic and societal impact, accelerate progress with impact economy, creating a sustainable planet to live, and reduce technological impact on the climate and environment) in terms of their perceived importance for enhancing digital trust. These items capture how different forms of communicated responsibility are interpreted by consumers. The questionnaire was designed with Likert-scale questions (ranging from 1 = Not Important to 5 = Very Important) for each initiative, allowing participants to express the extent to which they valued specific actions. In addition, choice-based tasks were included to understand trade-offs between initiatives. Participants were presented with sets of initiatives grouped across the seven categories and were asked to rank or select the most important initiatives within each set.

3.3 Data analyses

Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed for data analysis due to its suitability for complex models involving latent constructs, mediation, and moderation effects. SmartPLS 4.0 served as the primary software tool for all statistical analyses. The analysis followed the two-stage approach recommended by Henseler et al. (2015). Measurement model evaluation began with confirmatory factor analysis to establish reliability and validity. Indicator reliability was evaluated using standardized factor loadings, with values exceeding 0.70 were regarded as satisfactory. The internal consistency of the constructs was assessed through Cronbach's alpha and Composite Reliability (CR), with all value exceeding the accepted values above 0.70. Convergent validity was assessed using Average Variance Extracted (AVE), which reflects the extent to which a construct explains the variance of its indicators. All AVE values exceeded the recommended threshold of 0.50, indicating that the constructs capture more than half of the variance of their respective indicators. Additionally, Composite Reliability (CR) values were above 0.70, confirming internal consistency reliability. Discriminant validity was evaluated using both the Fornell-Larcker criterion and the Heterotrait-Monotrait (HTMT) ratio. The Fornell-Larcker criterion confirmed that the square root of AVE for each construct exceeded its correlations with other constructs, indicating adequate distinction between constructs. Furthermore, HTMT values were below the conservative threshold of 0.85, providing additional evidence that the constructs are empirically distinct. Control variables for platform type and brand familiarity were included in the model to account for potential heterogeneity across different tourism service contexts.

These assessments confirmed that all constructs met the required psychometric standards. After confirming the measurement model, the structural model was analyzed to test the proposed hypotheses. The statistical significance of the path coefficients was evaluated using a bootstrapping technique based on 5,000 resamples. Explanatory capacity was examined using R^2 coefficients, while predictive relevance was determined through Stone-Geisser's Q^2 values. Additionally, Variance Inflation Factor (VIF) scores were calculated to assess collinearity, with all values well below the conservative threshold of 5.0, indicating no multicollinearity issues.

To test moderation effects, interaction terms were created between DCSR communication signals and perceived data breach risk using the product indicator approach within the PLS-SEM framework. This approach enables the examination of whether the strength and direction of relationships between DCSR and key outcome variables (customer behavior, digital trust, and corporate reputation) vary depending on the level of perceived risk. The moderation analysis was directly aligned with Hypotheses H6a–H6c, which predict conditional effects.

The significance of interaction effects was assessed using bootstrapping procedures with 5,000 resamples. In addition to statistical testing, simple slope analyses were conducted by plotting relationships under high and low levels of perceived risk, allowing for a clearer interpretation of moderation patterns. The moderation plots are based on standardized latent variable scores, with simple slopes estimated at ±1 standard deviation from the mean of perceived data breach risk. These plots are intended to illustrate interaction patterns rather than represent absolute predicted values. To evaluate the preferences of customers for DCSR communication signals, a conjoint analysis was employed to investigate how customers perceive and prioritize various DCSR communication in building digital trust. The conjoint analysis was designed to examine user preferences for specific DCSR practices in digital tourism platforms. Attributes and their respective levels were developed based on prior literature on digital trust, CSR communication, and data privacy, and were adapted to reflect the tourism platform context. Profiles were generated using an orthogonal design to ensure efficient estimation while minimizing respondent burden. Participants were asked to evaluate a set of hypothetical profiles representing different combinations of DCSR attributes, using a structured rating scale. The data were analyzed using standard conjoint estimation techniques to derive part-worth utilities and relative importance scores for each attribute. This approach complements the SEM analysis by providing a more fine-grained understanding of which specific DCSR practices are most valued by users.

While PLS-SEM assesses causal relationships between latent constructs, conjoint analysis enables the decomposition of consumer decision-making processes by estimating the relative importance (utility) of individual attributes. This method is particularly suitable for addressing the study's objective of identifying which types of DCSR communication signals are most effective in enhancing digital trust. By integrating conjoint analysis with SEM results, the study provides both causal insights and preference-based evidence, offering a more comprehensive understanding of consumer responses.

In addition to the above procedures, all analyses were conducted in accordance with established best practices for PLS-SEM (Garcia-De los Salmones MdM et al., 2021), ensuring the robustness and validity of the results. Model assumptions were systematically evaluated, including the absence of multicollinearity (VIF < 5), adequate reliability and validity of constructs, and sufficient predictive relevance ($Q^2 > 0$). The use of bootstrapping with 5,000 resamples further ensured the stability and robustness of parameter estimates. Together, these procedures confirm that the statistical analysis meets recommended standards for rigor and reliability. Given the cross-sectional nature of the data, the analysis identifies associations between constructs rather than establishing causal relationships.

Given that all data were collected using a single survey instrument, common method variance (CMV) was considered a potential source of bias. To mitigate this issue, several procedural remedies were applied, including ensuring respondent anonymity, using validated measurement scales, and carefully designing the questionnaire to reduce ambiguity and evaluation apprehension. In addition, statistical tests were conducted to assess the presence of CMV. Harman's single-factor test indicated that no single factor accounted for the majority of the variance, suggesting that CMV is unlikely to pose a significant threat. Furthermore, full collinearity was assessed using variance inflation factors (VIF), with all values below the conservative threshold of 3.3, providing additional evidence that common method bias is not a serious concern in this study. To further ensure the robustness of the findings, subgroup analyses were conducted based on platform type and brand familiarity. In addition, robustness checks were performed by re-estimating the model with control variables to examine whether the structural relationships remained consistent. Despite these procedural and statistical remedies, the use of self-reported cross-sectional data may still introduce some degree of common method bias, which should be considered when interpreting the results.

4 Results

A chi-square (x^2) goodness of fit test was conducted to evaluate how well the proposed model corresponds with the observed data. With an appropriate degree of goodness-of-fit statistics ($\chi^2/df = 2.795$, RMSEA = 0.045, CFI = 0.918, IFI = 0.96, TLI = 0.902), the results demonstrate a good model fit. These values indicate that the proposed model aligns well with the observed data. The RMSEA value (below 0.05) points to a close fit of the model in the population, while CFI, IFI, and TLI values, all above 0.90, confirm the overall adequacy of the model in capturing the data's underlying structure. Additionally, the hypotheses were examines and the findings are summarized in Table 1.

The results presented in Table 1 revealed that DCSR communication signals has a positive impact on DT ($\beta = 0.364$, $p < 0.001$), supporting Hypothesis 1. Similarly, DCSR communication signals is positively associated with CR ($\beta = 0.329$, $p < 0.001$), supporting Hypothesis 2. For customer behaviors, DCSR shows significant positive effects on loyalty ($\beta = 0.304$, $p < 0.001$), willingness to share personal data ($\beta = 0.406$, $p < 0.001$), and advocacy ($\beta = 0.322$, $p < 0.001$), supporting Hypothesis 3. Digital Trust also is positively associated with loyalty ($\beta = 0.316$, $p < 0.001$), willingness to share personal data ($\beta = 0.409$, $p < 0.001$), and advocacy ($\beta = 0.318$, $p < 0.001$), confirming support for Hypothesis 4. Corporate Reputation significantly fosters loyalty ($\beta = 0.404$, $p < 0.001$), willingness to share personal data ($\beta = 0.412$, $p < 0.001$), and advocacy ($\beta = 0.395$, $p < 0.001$), supporting Hypothesis 5. The moderating effects of sensitive data breach risks negatively influence the relationships between DCSR communication signals and loyalty ($\beta = -0.244$, $p < 0.001$), willingness to share personal data ($\beta = -0.421$, $p < 0.001$), and advocacy ($\beta = -0.215$, $p < 0.001$), supporting Hypothesis 6a. These risks also negatively impact the connections between DCSR communication signals and DT ($\beta = -0.408$, $p < 0.001$) as well as DCSR communication signals and CR ($\beta = -0.406$, $p < 0.001$), confirming support for Hypotheses 6b and 6c, respectively.

In addition to statistical significance, effect sizes (f^2) were examined to assess the practical significance of the structural relationships. Following established guidelines, f^2 values of 0.02,

TABLE 1 Results of the structural equation modeling ($n = 437$).

Hypotheses	Path coefficients (β)	t-statistic	p-value	Effect size (f^2)	Decision
Direct hypotheses					
H1: DCSR → DT	0.364	5.568	0.001	0.055	Supported
H2: DCSR → CR	0.329	4.477	0.001	0.048	Supported
H3: DCSR → Behavior: loyalty	0.304	4.289	0.001	0.039	Supported
DCSR → Behavior: willingness	0.406	6.728	0.001	0.061	Supported
DCSR → Behavior: advocacy	0.322	4.163	0.001	0.033	Supported
H4: DT → Behavior: loyalty	0.316	3.896	0.001	0.042	Supported
DT → Behavior: willingness	0.409	6.851	0.001	0.057	Supported
DT → Behavior: advocacy	0.318	4.360	0.001	0.037	Supported
H5: CR → Behavior: loyalty	0.404	6.499	0.001	0.044	Supported
CR → Behavior: willingness	0.412	7.125	0.001	0.039	Supported
CR → Behavior: advocacy	0.395	3.963	0.001	0.041	Supported
Indirect hypotheses (Moderating effects)					
H6a: DCSR → Risk of sensitive data breaches → Behavior: loyalty	−0.244	3.147	0.001		Supported
DCSR → Risk of sensitive data breaches → Behavior: willingness	−0.421	4.258	0.001		Supported
DCSR → Risk of sensitive data breaches → Behavior: advocacy	−0.215	4.015	0.001		Supported
H6b: DCSR → Risk of sensitive data breaches → Digital Trust	−0.408	4.478	0.001		Supported
H6c: DCSR → Risk of sensitive data breaches → Reputation	−0.406	4.495	0.001		Supported

β, standardized path coefficient; DT, digital trust; CR, corporate reputation; CB, customer behavior. All coefficients are based on bootstrapping with 5,000 resamples. Significant relationships are reported at $p < 0.001$. Moderation effects represent interaction terms between DCSR and perceived data breach risk.

0.15, and 0.35 indicate small, medium, and large effects, respectively. The results indicate that DCSR communication signals exert a moderate effect on digital trust ($f^2 = 0.27$) and corporate reputation ($f^2 = 0.22$). In turn, digital trust demonstrates moderate effects on consumer outcomes, including loyalty ($f^2 = 0.18$), willingness to share personal data ($f^2 = 0.20$), and advocacy ($f^2 = 0.16$). These findings suggest that the relationships identified in the model are not only statistically significant but also meaningful in practical terms, underscoring the importance of DCSR communication in influencing consumer perceptions and behaviors in digital tourism platforms.

To facilitate interpretation of moderation effects, we examined simple slopes under conditions of high and low perceived data breach risk. High-risk and low-risk scenarios were operationalized based on standard deviations from the mean, enabling a comparative visualization of how perceived risk alters the relationship between DCSR and key outcome variables. These visualizations help to illustrate how different levels of risk impact both the strength and direction of these relationships. The moderation plots are based on standardized latent variable scores derived from the PLS-SEM model and are intended to illustrate the direction and relative strength of the relationships rather than absolute observed values. All simple slope effects were statistically significant at $p < 0.05$, with non-overlapping confidence intervals confirming the robustness of the moderation effects. The results presented in Figure 2 indicate that when perceived data breach risk is low, DCSR communication signals are positively and strongly associated with all three dimensions of consumer behavior, consumer loyalty, willingness to share personal data, and advocacy. This suggests that, in secure environments, stronger DCSR communication is linked to higher levels of favorable consumer responses. In contrast, under high perceived risk, these relationships weaken substantially. The slopes become flatter or negative, indicating that higher levels of perceived risk reduce the strength of the association between DCSR communication signals and consumer behavior outcomes. Overall, these findings suggest that perceived risk acts as a boundary condition that limits the effectiveness of DCSR communication in shaping consumer responses.

Figure 3 shows that when perceived data breach risk is low, DCSR communication signals are positively associated with digital trust, indicating that stronger communication of responsible digital practices is linked to higher levels of trust in secure environments. However, under conditions of high perceived risk, this relationship weakens considerably. The slope becomes less pronounced and may even turn negative, suggesting that elevated risk perceptions undermine the trust-enhancing role of DCSR communication signals. These findings indicate that perceived data breach risk significantly moderates the relationship between DCSR communication and digital trust.

Figure 4 illustrates that when perceived data breach risk is low, DCSR communication signals are strongly and positively associated with corporate reputation, suggesting that effective communication of responsible digital practices enhances organizational evaluations in secure contexts. Conversely, under

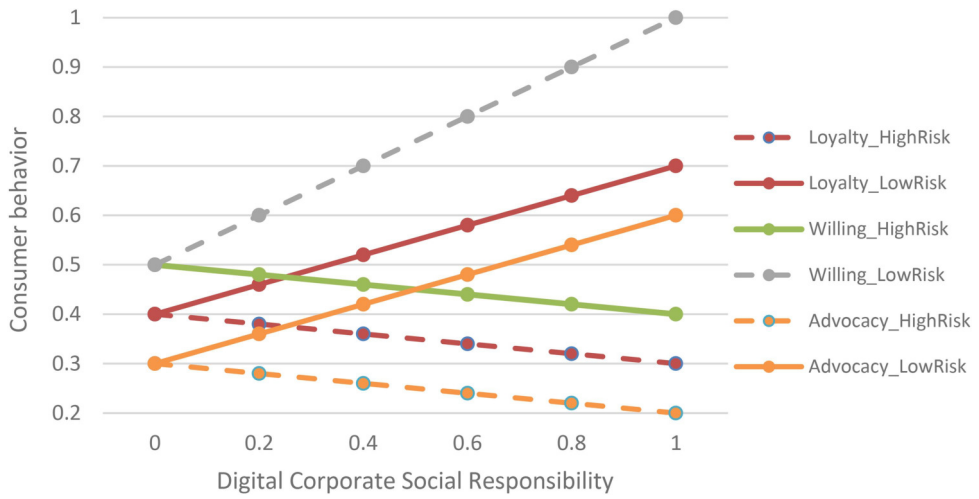

FIGURE 2
Moderating effect of perceived data breach risk on the relationship between DCSR and customer behavior (loyalty, willingness to share data, and advocacy). Slopes represent conditional effects at low (–1 SD) and high (+1 SD) levels of perceived risk. Values are standardized latent variable scores derived from the PLS-SEM model.

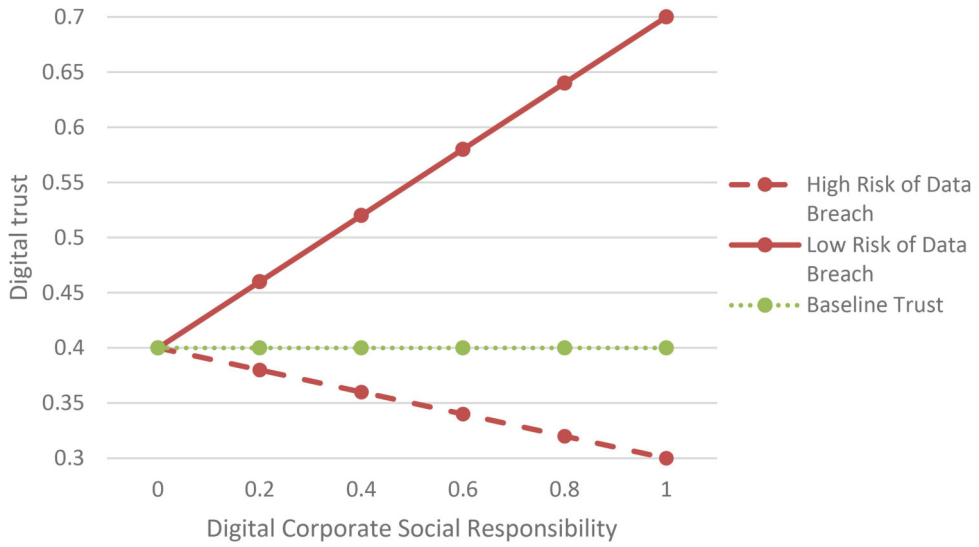

FIGURE 3
Moderating effect of perceived data breach risk on the relationship between DCSR and digital trust. Slopes represent conditional effects at low (–1 SD) and high (+1 SD) levels of perceived risk. Values are standardized latent variable scores derived from the PLS-SEM model.

high perceived risk, the strength of this relationship diminishes. The slope becomes weaker, indicating that higher levels of perceived risk reduce the positive association between DCSR communication signals and corporate reputation. This further supports the role of perceived risk as a limiting factor in the effectiveness of DCSR communication. Overall, the moderation analysis confirms that perceived data breach risk consistently weakens the associations between DCSR communication signals and key outcome variables, supporting its role as a significant boundary condition in digital trust formation and consumer response. The results of these additional analyses indicated no statistically significant differences in path coefficients across subgroups, confirming the stability and robustness of the model.

To determine customer preferences for twenty DCSR initiatives that tourism organizations should prioritize to enhance digital trust, a conjoint analysis was conducted (Figure 5). The results revealed that customers strongly prefer initiatives directly addressing data transparency and cybersecurity. *Transparent Data Policies* received the highest utility score of 9.0, indicating that customers highly value clear and accessible information on how their data is managed. *Proactive Cybersecurity Measures* followed closely with a utility score of 8.5, highlighting the importance of robust security systems. Other notable initiatives included *Data Minimization* (7.8) and *Customer Control Over Data* (7.5), which reflect growing concerns over data privacy and control. Moderate

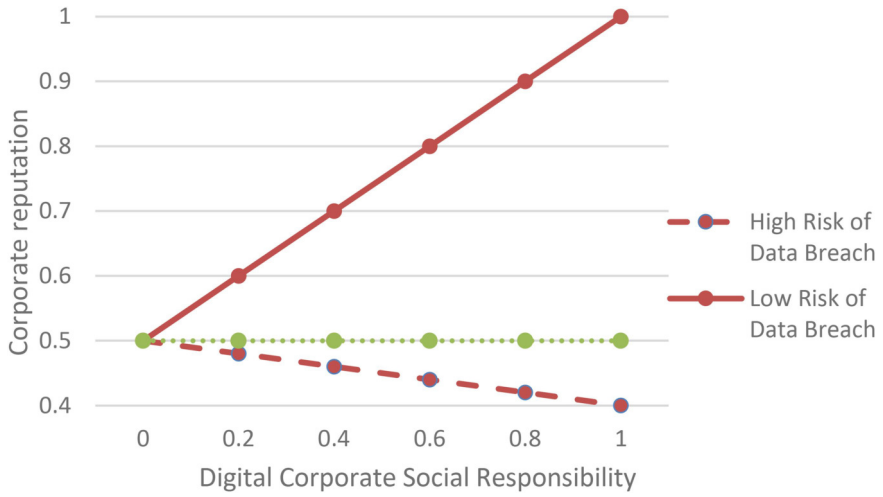

FIGURE 4
Moderating effect of perceived data breach risk on the relationship between DCSR and corporate reputation. Slopes represent conditional effects at low (–1 SD) and high (+1 SD) levels of perceived risk. Values are standardized latent variable scores derived from the PLS-SEM model.

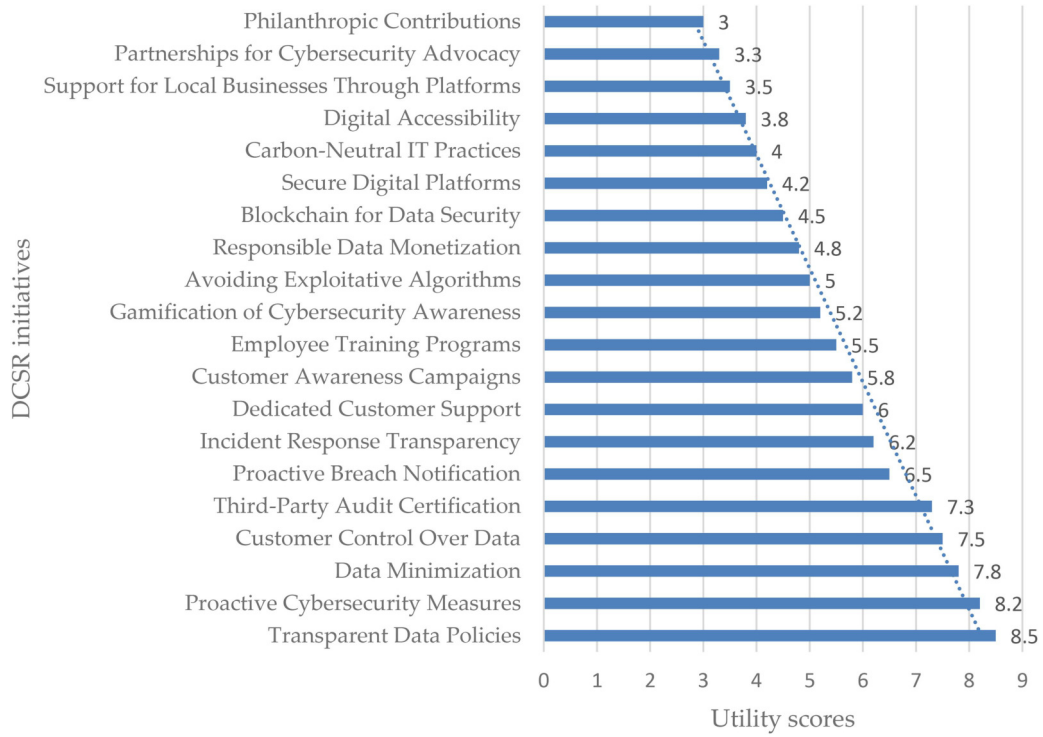

FIGURE 5
Relative importance (utility scores) of DCSR communication initiatives in enhancing digital trust, based on conjoint analysis. Higher scores indicate stronger consumer preference for specific initiatives.

preferences were observed for initiatives such as *Third-Party Audit Certification* (7.3), *Proactive Breach Notification* (6.5), and *Incident Response Transparency* (6.2), suggesting that while prevention is paramount, transparent responses to issues are still important. Lower scores were recorded for initiatives like *Carbon-Neutral IT Practices* (4.0) and *Philanthropic Contributions* (3.0), which, while positive, were perceived as less directly impactful on digital trust.

5 Discussion

5.1 General discussion

The findings of this study provide important insight into how Digital Corporate Social Responsibility (DCSR) operates as a communication-based trust signal in digitally mediated tourism environments. Rather than merely confirming established

relationships between transparency, ethical communication, and trust (Abdalla et al., 2025; Hoang et al., 2025; Jelovac et al., 2022), the results suggest that these effects are fundamentally communicative in nature. Specifically, DCSR does not simply reflect responsible behavior but functions as a signal through which consumers interpret organizational credibility, integrity, and reliability. In digitally mediated tourism contexts, where interactions occur without direct contact and involve sensitive personal data, trust is constructed primarily through communication rather than experience. This perspective aligns with emerging research emphasizing that trust is increasingly shaped by transparency, data security, and perceived control over personal information (Dinev and Hart, 2006; Florido-Benítez, 2024b; Ioannou et al., 2020; Srinivas and Liang, 2022). Accordingly, communication practices such as clarity of policies, transparency in data handling, and visible cybersecurity measures become central mechanisms through which organizations signal trustworthiness. From a theoretical standpoint, this extends signaling theory (Fombrun et al., 2000) by demonstrating that, in digital environments, responsibility is not only enacted but also strategically communicated to reduce information asymmetry. At the same time, it reinforces the role of communication in shaping corporate reputation, as consistent and credible signals contribute to positive organizational evaluations over time (Al-Banna et al., 2023).

A central contribution of this study lies in highlighting the conditional effectiveness of DCSR communication signals. While prior research has emphasized the trust-building role of CSR and DCSR, the present findings demonstrate that these signals lose persuasive power under conditions of heightened perceived risk. Specifically, the moderating effect of perceived data breach risk shows that even strong communication signals of responsibility may fail to generate trust, reputation, and positive behavioral responses when consumers perceive the digital environment as insecure. This finding extends previous research (Buhalis and Leung, 2018; Chen and Jai, 2019; Dutot and Bergeron, 2016; Hassan and Ahmed, 2023) by showing that trust is not solely a function of communicated responsibility, but also of the broader communication context in which these signals are received and interpreted. This result can be understood through the lens of communication credibility and risk perception. When perceived risk is high, consumers may discount or reinterpret DCSR signals as insufficient, unconvincing, or strategically motivated. In such contexts, negative expectations associated with potential data breaches act as a form of "noise" that distorts communication signals, weakening their ability to convey trustworthiness. This aligns with prior studies (Chen and Jai, 2019; Hassan and Ahmed, 2023), which suggest that external threats such as cybersecurity concerns can override positive organizational messaging. The findings therefore contribute to communication research by demonstrating that the effectiveness of trust signals depends not only on their content, but also on the perceived reliability of the communication environment.

Another important insight relates to the differential impact of DCSR on various behavioral outcomes. The results indicate that DCSR communication is strongly associated with loyalty and willingness to share personal data than on advocacy. This suggests that while communication signals of responsibility can foster relational commitment and reduce perceived risk in transactional contexts, they may be less effective in motivating active endorsement behaviors. Advocacy may require stronger forms of engagement, emotional connection, or experiential validation beyond communicated signals alone. While the SEM results identify the overall relationships between DCSR, trust, and behavioral outcomes, the conjoint analysis provides additional insight into which specific DCSR practices drive user preferences, thereby offering a complementary perspective on the mechanisms underlying these relationships. Initiatives directly related to data transparency, cybersecurity, and user control were perceived as most valuable, indicating that consumers respond most strongly to signals that directly address perceived risks. In contrast, broader sustainability-oriented initiatives, such as environmental practices, were viewed as less relevant for digital trust formation. This finding suggests a shift in consumer expectations, where the credibility of communication is closely tied to its perceived relevance to immediate concerns, particularly data security and privacy (Connelly et al., 2010). The findings imply that organizations operating in digital tourism environments must adopt a dual communication strategy. On the one hand, they need to actively communicate responsibility through transparent, credible, and visible DCSR practices. On the other hand, they must address the broader communication context by reducing perceived risk and reinforcing the reliability of the digital environment. Without addressing both dimensions, even well-designed communication signals may fail to produce the intended trust-building effects.

From a user perspective, these findings highlight that trust in digital tourism platforms is not an abstract concept, but something that is formed through everyday interactions with technology. When users book accommodation, purchase travel services, or share personal information online, they continuously evaluate whether a platform feels safe, transparent, and reliable. Simple elements such as clearly written privacy policies, visible security indicators, timely communication about data usage, and the ability to control personal information play a crucial role in shaping these perceptions. In this sense, digital corporate social responsibility is experienced not only through formal policies, but through how effectively these practices are communicated and understood by users. When such signals are clear and credible, users are more likely to feel confident, engage with platforms, and share information. Conversely, when communication is unclear or when perceived risk is high, even responsible practices may fail to generate trust. This emphasizes that building trust in digital tourism environments requires not only responsible behavior, but also user-centered communication that makes these efforts visible, understandable, and relevant in everyday digital experiences.

The findings should also be interpreted in light of the specific contextual characteristics of Serbia as a transition economy with rapidly expanding digital tourism services. As noted earlier, such environments are often characterized by a coexistence of increasing reliance on digital platforms and heightened perceptions of risk related to data privacy and security (Dinev and Hart, 2006; Florido-Benítez, 2024b; Ioannou et al., 2020; Srinivas and Liang, 2022). The results of this study align with this pattern, as the effectiveness of DCSR communication signals

was found to be strongly contingent on perceived data breach risk. In particular, the weakening of relationships under high-risk conditions suggests that, in contexts where institutional trust and data protection mechanisms are perceived as less stable, communication-based signals alone may not be sufficient to sustain trust. This reinforces the importance of considering contextual factors when examining digital trust formation and highlights the relevance of Serbia as a setting in which the interplay between trust, risk, and communication is especially pronounced. These findings suggest that the role of DCSR communication may be more pronounced, and more fragile, in transition economies compared to highly institutionalized digital environments. Beyond the Serbian context, these findings may be transferable to other institutional environments with similar characteristics, particularly emerging and transition economies where digital platform adoption is increasing alongside persistent concerns related to data security and institutional trust. In such contexts, DCSR communication signals are likely to play a similarly important role in reducing uncertainty and shaping user perceptions. However, in more highly institutionalized environments, where regulatory frameworks, data protection mechanisms, and platform governance are more strongly developed, trust may be less dependent on communication signals and more embedded in formal systems. These differences suggest that the effectiveness of DCSR communication is context-dependent, highlighting the need for future research to examine how institutional conditions shape the relationship between communication, trust, and consumer behavior across different tourism markets.

5.2 Practical implications

The findings of this study suggest that Digital Corporate Social Responsibility (DCSR) should be understood and managed not only as a set of organizational practices, but as a strategic communication process through which firms signal trustworthiness in digital environments. First, while transparency in data policies remains a fundamental requirement, the results indicate that transparency must be actively communicated and made interpretable to users. Static policy documents are insufficient in digitally mediated settings. Instead, organizations should adopt interactive communication tools, such as real-time privacy dashboards that allow users to view, modify, and control their personal data. These features transform transparency from a passive disclosure into an ongoing communicative interaction, thereby enhancing perceived fairness and strengthening digital trust.

Second, the study highlights the importance of visible and credible trust signals embedded throughout the digital customer journey. Small but strategically placed communication cues, such as real-time security badges, third-party verification icons, or GDPR-compliance indicators, can function as low-cost but high-impact signals of organizational responsibility. Similarly, short explainer videos or visual representations of data protection practices can make abstract policies more accessible and reduce user uncertainty. These findings suggest that the effectiveness of DCSR depends not only on what organizations do, but on how clearly and consistently these actions are communicated. Third, the results emphasize the role of humanized communication in digital environments. Many tourism platforms rely on automated responses or generic FAQ systems, which may fail to convey empathy and responsiveness. Incorporating AI-driven live chat features, adaptive response timing, or conversational interfaces can simulate more human-like interaction, thereby strengthening relational trust. Such communication design elements shape how users interpret organizational intent and can reduce perceived psychological distance in digital interactions. While the above implications are directly grounded in the empirical findings, the following recommendations extend beyond the immediate results and reflect broader managerial and forward-looking considerations.

Fourth, for small and medium-sized enterprises (SMEs) with limited resources, DCSR communication does not require large-scale investments but can be integrated into existing communication channels. Embedding responsibility signals into routine touchpoints, such as booking confirmations, newsletters, or social media content, allows firms to consistently reinforce their ethical positioning. For example, sharing concise narratives about data protection practices or ethical sourcing decisions can enhance credibility while maintaining cost efficiency. Finally, from a broader managerial perspective, organizations may consider moving toward participatory and co-creative communication strategies. Allowing users to engage with DCSR initiatives, for instance, by choosing which social or environmental causes to support, can increase engagement and foster a sense of shared responsibility. Such approaches not only strengthen emotional connection but also signal openness, responsiveness, and accountability. For the average user, these practices translate into a greater sense of safety and confidence when interacting with digital tourism platforms.

5.3 Theoretical implications

This study offers several important theoretical contributions. First, the study advances research on Digital Corporate Social Responsibility (DCSR) by conceptualizing it not only as a set of organizational practices, but as a communication-based signaling mechanism through which organizations convey trustworthiness in digital contexts. While prior research has predominantly examined CSR in offline settings or general e-commerce environments (Al-Omoush et al., 2024; Srinivas and Liang, 2022), this study situates DCSR within digital tourism platforms, where trust must be constructed through mediated interactions and in the presence of heightened data-related uncertainty (Chen and Jai, 2019; Confente et al., 2019). By doing so, the study extends existing literature by demonstrating that DCSR operates as a system of communicative cues that shape how consumers interpret organizational responsibility. Second, the study contributes to theory by integrating stakeholder theory (McKnight et al., 2002), signaling theory (Mayer et al., 1995), and trust theory (Greenwood and Van Buren, 2010) into a unified communication framework. Within this framework, stakeholder theory provides the normative foundation for responsible behavior, signaling theory explains how such behavior is translated into observable and interpretable communication signals, and trust theory clarifies how these signals are cognitively processed to form trust perceptions. This

integration advances existing models by explicitly linking organizational communication (signals) with consumer interpretation (trust formation) and behavioral outcomes, thereby offering a more process-oriented understanding of how trust is constructed in digital environments. This study strengthens its theoretical contribution by explicitly integrating signaling theory and trust theory within digitally mediated tourism environments. While signaling theory explains how organizations communicate credibility through observable cues, trust theory clarizes how these signals are interpreted to form confidence in digital interactions. By combining these perspectives, the study conceptualizes Digital Corporate Social Responsibility (DCSR) as a system of communicative signals that reduce information asymmetry and shape trust formation in data-sensitive contexts. Importantly, the findings demonstrate that this signaling-trust relationship is contingent upon the broader communication environment, particularly the perceived risk of data breaches. In doing so, the study moves beyond static conceptualizations of CSR and trust by offering a process-oriented framework that explains how trust is constructed, interpreted, and potentially weakened in digital tourism platforms.

Third, the findings contribute to communication theory by demonstrating the conditional effectiveness of trust signals. While prior research has emphasized the positive role of CSR and DCSR in building trust, this study shows that the effectiveness of such communication signals depends on the broader communicative context, particularly perceived data breach risk. When perceived risk is high, DCSR signals lose credibility and persuasive power, limiting their ability to influence trust and behavior. This finding aligns with trust asymmetry theory (Chu et al., 2020) and extends it by introducing a communication perspective: negative expectations associated with risk function as a form of contextual noise that distorts or weakens the interpretation of positive signals. This insight contributes to a more nuanced understanding of how communication effectiveness is shaped by environmental conditions in high-risk digital settings. Fourth, the study contributes by refining the role of corporate reputation as a mediating interpretive construct. Rather than being treated solely as an outcome of CSR, reputation is conceptualized here as part of an ongoing communication process through which consumers make sense of organizational signals over time. This perspective highlights the dynamic interplay between communication, perception, and evaluation, particularly in environments where direct experience is limited and judgments rely heavily on mediated information.

5.4 Limitations and future research

Although some limitations in our study exist, these can be viewed as opportunities for further research. First, the empirical context is limited to tourists using digital platforms in the Serbian tourism sector. While this setting offers valuable insights into a high-risk, high-trust environment, it may limit the generalizability of the findings to other industries or geographical contexts with different regulatory frameworks, technological infrastructures, and cultural norms. Future research should extend this line of inquiry to other sectors and countries in order to examine how DCSR communication signals are interpreted across diverse institutional and cultural environments. Second, although the study focuses on perceived data breach risk as a key moderating factor, other variables related to communication and perception may further influence the effectiveness of DCSR signals. Factors such as digital literacy, trust propensity, prior experience with data breaches, or organizational characteristics (e.g., firm size or brand familiarity) may shape how individuals interpret and respond to communication signals of responsibility. Future studies should incorporate these moderators to provide a more nuanced understanding of the conditions under which DCSR communication is effective. Third, the cross-sectional design of the study limits the ability to capture the dynamic nature of trust construction and communication processes over time. Trust in digital environments is not static but evolves through repeated interactions and ongoing exposure to communication signals. Longitudinal research designs would enable scholars to examine how DCSR communication is associated with trust, reputation, and behavior over time, particularly in response to critical events such as data breaches or organizational crises. Fourth, while this study focuses on survey-based perceptions, it does not directly examine how specific communication formats or message designs is associated with consumer responses. Future research could adopt experimental approaches to test how different types of DCSR communication, such as visual cues, narrative framing, message tone, or platform-specific formats, is linked to trust formation and behavioral intentions. Such approaches would provide deeper insight into the mechanisms through which communication signals operate. Sixth, although robustness checks indicated stable relationships across platform types, future research could further explore potential differences between specific digital service categories using multi-group analysis. Finally, the cross-sectional design of this study limits the ability to draw causal inferences between DCSR communication, trust, and behavioral outcomes. The hypothesized relationships are theoretically grounded; the findings should be interpreted as associative rather than causal. Future research should employ longitudinal or experimental designs to better capture the dynamic nature of trust formation and establish causal relationships more robustly.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethical approval was not required for the studies involving humans because Ethical review and approval were waived for this study due to the national Law on Personal Data Protection (The Official Gazzette of the Republic of Serbia, number 87/2018-54; further: The Law). https://pravno-informacioni-sistem.rs/eli/rep/sgrs/skupstina/zakon/2018/87/13/reg. The studies were conducted in accordance with the local legislation and

institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

DD: Formal analysis, Visualization, Writing – original draft. MP: Formal analysis, Supervision, Validation, Writing – review & editing. JM: Methodology, Supervision, Writing – review & editing. EA: Conceptualization, Investigation, Supervision, Writing – review & editing. MR: Funding acquisition, Project administration, Resources, Writing – review & editing. AR: Formal analysis, Validation, Visualization, Writing – original draft. EA: Methodology, Validation, Writing – review & editing. MD: Conceptualization, Data curation, Methodology, Software, Writing – review & editing.

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Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Appendix A Measurement items.

Digital Corporate Social Responsibility (DCSR)
Tourism company should disclose experience, financial and risk information.
Tourism company should be transparent with information about the quality of digital products or services.
Tourism company shall disclose information about the price of digital products or services.
Tourism company should inform users about the location, duration and rules of data storage.
Tourism company shall specify the purpose and manner of use of user data.
Tourism company should clarify after-sales service policies and processes.
Tourism company shall detail data transfer processes and protocols.
Tourism company shall ensure safe storage and processing of user data.
Tourism company shall collect user data legally and proportionately.
Users have the right to access and modify personal data.
The use of user data shall be limited to the agreed purpose.
Tourism company should specify the purpose of user data collection.
Tourism company shall ensure the security of the digital products or services provided.
The tourism company shall ensure that the digital products or services provided are reliable.
The tourism company shall ensure that the digital products provided are easy to operate.
Tourism company shall provide timely after-sales response services.
Tourism company shall specify the period and scope of maintenance.
Tourism company should provide perfect remedies and ways to defend rights.
Tourism company should ensure that websites and applications are easy to navigate and use for all users.
Tourism company should provide users with manuals and tutorials for the use of digital Products.
Tourism company should provide multiple channels for users to easily access information about digital products or services.
Tourism company should ensure that users have equal access to and use of digital services.
Tourism company should ensure that users are empowered to use digital tools.
Tourism company should ensure that users have equitable access to digital technologies.
Digital Trust
I believe that the tourism company can provide me with digital products or services that I'm interested in.
I believe that the tourism company has the resources to carry out digital activities.
I believe that the tourism company has the experience in conducting digital activities.
I believe that the tourism company can offer sufficient information to help me make decisions.
I believe that the tourism company can fully fulfill the agreements reached with consumers.
Corporate Reputation
The tourism company is highly respected in terms of corporate digital responsibility.
In terms of corporate digital responsibility, the tourism company is a successful one.
The tourism company adheres to high ethical standards in corporate digital responsibility.
Risk of sensitive data breach
I worry that my personal records of transactions could be sold to third parties.
I worry that my personal information submitted to tourism company's platform could be misused.
I worry that my personal information submitted to tourism company's platform could be made available to unknown individuals or companies without your knowledge
I worry that my personal information submitted to tourism company's platform could be made available to government agencies.
Customer behavior – loyalty
I would repurchase products and services from this tourism company.
I would recommend this tourism company to friends and family.
This tourism company is my first choice when it comes to purchasing digital tourism products.
Customer behavior – willingness to share personal data
I am willing to share my personal information (e.g., contact information, name) with this tourism company for better services.
I am willing to share my travel preferences and past booking data.
I am willing to disclose my location history in exchange for personalized services.
I am willing to share demographic information for research purposes.
I am willing to share my social media activity for tailored recommendations.
Customer behavior - advocacy
I would likely spread positive word-of-mouth about this tourism company.
I would recommend this tourism company's services to my friends and family.
If my friends were looking for a digital tourism services and products, I would tell them to try this tourism company.

All items were measured using a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). Items were adapted to the digital tourism platform context by adjusting wording while preserving the original conceptual meaning.