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THE CHALLENGE OF COMMUNICATING CORPORATE SUSTAINABILITY ON WEBSITE: THE ROLE OF DIALOGIC POTENTIAL

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Abstract. With the growing social concern for corporate sustainability, organizations are under increasing pressure to communicate their sustainability efforts transparently and effectively. Websites, driven by their participatory nature, have emerged as pivotal platforms for such communication and a key relational tool. This study explores the role of website communication in fostering dialogic potential to facilitate two-way communication on sustainability issues. This research delves into the level of two-way communication of websites, which is determined by a suitable management of sustainability content and the presence of interactive features. Specifically, this study aims to identify boundaries in website design features that influence the effectiveness of sustainability communication. To this end, a novel measurement instrument, the Two-Step Index, has been designed to provide a comprehensive and in-depth assessment of the dialogic potential of websites. Few studies have explored the dialogic potential of websites for sustainability communication highlighting the need to uncover limitations and gaps in current practices. The findings reveal a low level of dialogic potential in corporate sustainability communication on the sampled websites, with a stronger emphasis on content management than on interactivity. Based on these results, practical insights are provided, along with specific actions to facilitate the implementation of dialogic strategies on websites.

Keywords: corporate sustainability communication, two-way communication, dialogic communication, web-based communication, content management on sustainability, interaction management.

JEL Classification: M14, M15, M30, M31, M39.

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1. Introduction

Due to the growing social concern for the human rights and the effects resulting from climate change, many organizations are undergoing drastic changes to adopt a more sustainable business model (Ponte, 2020) and disclose more information about their sustainability and corporate social responsibility (CSR) efforts, (Kim & Ferguson, 2018). This enhanced environmental and social awareness leads stakeholders to demand more information on corporate sustainability (CS) or CSR (Diehl et al., 2016). In response, organizations try to establish fluid and effective communication of values, actions, and results to stakeholders as a key relational and strategic tool (Carlini & Grace, 2021). Reporting on CSR activities enhances stock returns (Horobet et al., 2024), transparency and fosters dialogue between companies and stakeholders, thereby legitimising firms' behaviour (Garcia-De-Los-Salmones et al., 2021) and the way of communicate the sustainability information significantly shapes the perceptions

and associations consumers form with the brand (Capriotti & Zeler, 2020).Thus, the challenge that companies face in determining the most appropriate way to communicate sustainability is attracting increasing academic interest (Dedeoğlu et al., 2020).

CS and CSR – terms used indiscriminately given their similarity (Perez-Cañizares, 2021) – can be considered a participatory social process in which communication plays a central role (Golob et al., 2013, 2023). Research in the area of communication views dialogic communication as the interaction of ideas and opinions within a relational context (Kent & Taylor, 1998). To fully understand this communication process, it is essential to consider that today digital media, such as websites, not only provide a direct connection that facilitates consumer-company interaction (Wang, 2021) but have also transformed the way organizations communicate in the field of CS/CSR (Illia et al., 2017; Quiles-Soler et al., 2023). Thanks to their capacity to present and exchange information flexibly and interactively, corporate websites have become essential tools for communicating sustainability information (Wong et al., 2015). Websites also support the process of exchanging common values and interests between the company and its stakeholders in an interactive way. This characteristic enables the co-creation of CSR actions focused on stakeholders' needs and desires. As a result, they have become the most extensively employed communication medium by companies (Ajayi & Mmutle, 2021). Although some studies suggest that certain website design features (e.g., interactive features such as chatbot or links to social media) encourage two-way or interactive communication and foster relationship building between the company and its stakeholders (Tsai et al., 2021), notable debate exists surrounding the efficacy of communicating about sustainability in a dialogic manner (Dunn & Harness, 2018). On the one hand, certain studies highlight the advantages of engaging in dialogic sustainability communication, such as cultivating trust in the brand, generating positive word-of-mouth (Dai & Reich, 2023), and mitigating scepticism towards the brand's sustainability endeavours (Andersen & Høvring, 2020). On the other hand, others indicate that companies are not effectively capitalising on the potential of their websites for corporate sustainability communication (Chong et al., 2016; Fernández-Vázquez, 2021). Particularly lacking is the utilization of the website in a dialogical manner (Augusto, 2017; Capriotti & Moreno, 2007; Gómez, 2018). This lack of consensus has limited efforts to develop robust measurement instruments that could confirm and optimize the role of websites as two-way tools for sustainability communication. Therefore, it is crucial to analyse the role of websites as relational tools for dialogic communication about sustainability, addressing this gap in the literature. This research delves into whether the level of dialogic potential or two-way communication is determined by suitable management of sustainability content and interactive features on the website. Specifically, it aims to identify limitations and deficiencies in website design features that influence the effectiveness of sustainability communication.

The present study utilises the dialogic communication strategic framework (Kent & Taylor, 1998; Madichie & Hinson, 2014) as a reference to fill this research gap by exploring the dialogic potential to facilitate two-way interactions through websites. The objective is not to analyse the dialogue conducted on websites but rather to assess their dialogic potential, as dialogue is a sophisticated process which transcends the mere exchange of information generated in digital media (Taylor & Kent, 2014).

To address this aim, a novel measurement tool is designed to assess the dialogic potential of corporate websites: the *Two-step Index*. This measure allows a broad and in-depth assessment of the dialogic potential of websites, unifying and extending the key content categories on sustainability in previous studies (Vollero et al., 2022). The application of the

Two-step Index makes it possible to detect the deficiencies in the content management on sustainability and interaction management on the website. Based on these results, practical implications with specific actions are provided to take advantage of the dialogic potential of a website and change the way organizations perceive the usefulness of website as interactive, two-way and ultimately dialogic tools in the context of sustainability.

In the following Sections, we will outline the key concepts and provide a detailed presentation of the methodology. Subsequently, we will present the main results and discuss their theoretical and managerial implications.

2. Literature review

2.1. Corporate sustainability communication

Corporate social responsibility is defined as a corporation's obligation to adopt policies and actions aligned with social objectives and philanthropic activities, extending beyond purely economic responsibilities (Carroll, 2010). This approach has evolved from a primarily philanthropic focus to a broader model based on the Triple Bottom Line (TBL), integrating social, environmental, and economic responsibilities to create shared value (Sarkar & Searcy, 2016). In parallel, corporate sustainability emerged alongside the concept of sustainable development (Hahn et al., 2017) and, like CSR, is grounded in TBL principles. While CSR and CS share foundational principles, CS represents an evolution toward the creation of enduring value, implying a greater sense of corporate commitment and responsibility (Baumgartner & Rauter, 2017; Hahn et al., 2017).

CSR communication refers to information on CSR initiatives directly generated and disseminated by a company (Kim, 2019). In comparison, CS communication involves a participatory social process aimed at enhancing economic, social, and ecological well-being (Golob et al., 2023; Ziemann, 2011). Although each type of communication has certain differentiated nuances, both are dynamic, interdisciplinary processes that share common characteristics (Golob et al., 2023; Verk et al., 2021). This often leads to their interchangeable use due to their perceived similarity (Perez-Cañizares, 2021), despite CSR communication having developed as a distinct field (Golob et al., 2023). Accordingly, this study will refer to both collectively as CS communication to encompass both terms.

Prior research identifies two primary perspectives within CS communication: (1) Functionalistic and (2) Constructivist (Crane & Glozer, 2016; Schoeneborn et al., 2020; Verk et al., 2021; Weder et al., 2021). The first is based on a traditional communication model, which considers communication as a linear process (Schoeneborn et al., 2020), with a monologic or one-way flow of information. Messages directed at stakeholders seek to inform, educate, or foster social commitment to build credibility and trust. The second perspective views communication as an exchange of sustainability information. CS communication is understood as a means to foster two-way interaction and, ultimately, dialogic communication, co-creating a shared understanding of sustainability-related issues. It represents a more dialogic and constructivist approach (Schoeneborn et al., 2020; Weder & Erikson, 2023).

Currently, CS communication should follow a constructivist approach, achieving a vision of sustainability aligned with stakeholders' concerns through dialogue. (Golob et al., 2023; Weder et al., 2021). Nevertheless, most studies analysing the CS communication developed by companies adopt a functionalist approach (Verk et al., 2021), while those aiming to examine sustainability communication through a dialogic or constructivist perspective report diverse outcomes (Kent & Taylor, 2016; Nair et al., 2022; Uysal, 2018). Several studies highlight the

greater likelihood of dialogic communication being present in large environmentally conscious companies, as well as its favourable effects on trust, word-of-mouth promotion, and scepticism reduction (Andersen & Høvring, 2020; Dai & Reich, 2023; Uysal, 2018). Tesařová et al. (2020), emphasise that it is essential for companies to develop well-structured CS communication tailored to different digital platforms. In this regard, corporate websites could serve as an effective medium for communicating sustainable initiatives and fostering two-way communication. Conversely, some research suggests that companies are not fully leveraging the potential of their websites for dialogic corporate sustainability communication (Augusto, 2017; Capriotti & Moreno, 2007; Gómez, 2018). Therefore, it is crucial to understand how to communicate sustainability information from a dialogic perspective on websites, as well as to identify the areas of improvement in website designs. This understanding is essential for fostering sustainability communication strategies within companies.

2.2. Dialogic theory-based strategic framework

The dialogic framework was defined by Kent and Taylor (1998) as a "theory-based strategic framework to guide relationship building across the World Wide Web" (p. 322). It recognises the potential of the website for building relationships between parties, based on the principles of dialogue. Following Taylor and Kent (2014) the concept of dialogue encompasses five principal characteristics: (1) *mutuality* (organization or publics relationships), (2) *propinquity* (temporariness and spontaneity of interactions organization/publics), (3) *empathy* (support/confirmation of public goals/interests), (4) *risk* (willingness to interact with publics on their terms) and (5) *commitment* (the degree to which organization is committed to dialogue, interpretation and understanding in its interaction with publics). Although two-way communication is a precursor to dialogue (Lane, 2020), it is common to conflate both terms (Wirtz & Zimbres, 2018). But dialogue does not have the same meaning as two-way communication. To solve this confusion, Lane (2020) introduces the Dialogic Ladder framework, which illustrates the progression from two-way communication, through dialogue-in-name, to true Dialogue. This framework highlights both the distinctions and connections between true Dialogue and other forms of communication that do not qualify as true Dialogue.

From a communication research perspective, dialogic communication refers to interactions between organizations and stakeholders that seek to create mutual respect, understanding and benefit (Wirtz & Zimbres, 2018). Dialogue attenuates power relations and involves participants in conversation and decision making (Taylor & Kent, 2014). Therefore, dialogic communication should help companies better serve society, as it assists them in meeting societal and stakeholder expectations, thereby ensuring their survival.

As CS communication is a dynamic and interactive process between a company and its stakeholders (Brennan et al., 2013), it establishes a context that fosters engagement and dialogue between organizations and the public (Taylor & Kent, 2014).

To facilitate this dialogue, companies should use appropriate channels to manage and cultivate reliable relationships with stakeholders (Abitbol & Lee, 2017). Notably, websites have significant potential for dialogic communication, as they facilitate two-way communication and promote interactivity (Madichie & Hinson, 2014). By using their websites for CS communication, companies can foster engagement and reciprocal exchange (Maier & Ravazzani, 2019). This approach is perceived by certain groups, such as activists, as both an ethical and practical means of disclosing information (McAllister-Spooner & Kent, 2009). Moreover, many nonprofit organizations actively use their websites to facilitate dialogic communication (Nair

et al., 2022). Communicating CS in an honest and transparent manner plays a crucial role in a company's success, enhancing its legitimacy, reducing scepticism toward CS, and generating positive responses, such as purchase intention (Andersen & Høvring, 2020; Lee & Comello, 2019; Viererbl & Koch, 2022). Furthermore, adopting a dialogic perspective in CS communication is essential for facilitating digital accessibility through the proper organization and presentation of information (Gleason et al., 2020). Digital accessibility enables companies to provide all individuals with equal access to resources and information on the Internet (Waddell et al., 2003), an important objective of CS.

To apply this perspective, the dialogic framework proposes five strategies to help organizations build dialogic relationships with stakeholders. These principles are: (1) The *dialogic loop principle*, which is based on the concept of interactivity, facilitating two-way communication and fostering dialogue; (2) The *usefulness of information principle*, which relates to the type of content that is useful for website users, aligning with their values and interests; (3) The *generation of return visits principle*, which suggests that websites should include appealing features to encourage users to revisit, such as updated content and interactive strategies; (4) The *intuitiveness/ease of the interface principle*, which implies that website design should simplify user navigation, emphasising the organization of information, easy to find -hierarchy and the extent of information provided; (5) The *conservation of visitors principle*, which emphasises that websites should be designed to retain users effectively. All these principles are used in this research to develop the *Two-step Index*.

2.3. Dialogic communication and web-based CS communication

Corporate websites hold great potential to initiate dialogue through specific design features (e.g., interactive elements such as reviews, contact forms, or similar) that encourage two-way or interactive communication. This form of communication fosters relationship-building between the company and its stakeholders (Tsai et al., 2021). However, they have so far underutilised the possibilities offered by the dialogic or constructivist approach to communication. It has been applied to assess the implementation and impact of dialogic principles across different digital communication technologies, including websites (Dai & Reich, 2023; Madichie & Hinson, 2014), mobile websites (McCorkindale & Morgoch, 2013), and social media (Abitbol & Lee, 2017; Herrada-Lores et al., 2024; Wang & Yang, 2020).

A notable debate exists regarding the effectiveness of using a dialogic approach to communicate sustainability (Dunn & Harness, 2018). Dai and Reich (2023) found that dialogic features for communicating sustainability on websites help build brand trust and encourage positive word-of-mouth, while Andersen and Høvring (2020) highlight the role of dialogic communication in reducing scepticism toward CS. Other studies indicate that the dialogic potential of a website for sustainability communication is influenced by factors such as the organization's sector, and the company's environmental awareness, size, and resources (Olinski & Szamowski, 2017; Uysal, 2018; Wirtz & Zimbres, 2018). However, many studies conclude that organizations fail to implement dialogic principles effectively and instead rely on unidirectional communication (Madichie & Hinson, 2014; McCorkindale & Morgoch, 2013; Olinski & Szamowski, 2017), especially for sustainability communication (Augusto, 2017; Capriotti & Moreno, 2007; Gómez, 2018). This limited application has led to scepticism among professional regarding the effectiveness of dialogic strategies in digital communication. One reason for this scepticism is the perception that website technologies are not inherently dialogic tools (Wirtz & Zimbres, 2018).

In light of this lack of consensus, efforts to develop robust measurement instruments that could confirm and optimize the role of websites as two-way tools for sustainability communication have been limited. Thus, analysing their role as key relational tools is essential. The objective is to identify the limitation and deficiencies in website design features and suggest improvements to foster more effective sustainability communication. Such enhancements could facilitate two-way interaction, potentially initiating meaningful dialogue on sustainability issues. Modern websites increasingly integrate a variety of social web functions and interactive features to support two-way communication and fully leverage their dialogic potential. Studies indicate that specific design features, such as chatbots and social media links, enhance bidirectional communication and foster stronger relationship-building with stakeholders (Tsai et al., 2021). These elements can influence practitioners' perceptions of the value of dialogic communication frameworks (Wirtz & Zimbres, 2018).

To fill this gap in the literature, the present study develops a novel two-step evaluation method, broadly and deeply addressing the two key dimensions of communication management in digital communication technologies as shown in Table 1. In line with Capriotti and Kuklinski (2012), the dialogic loop principle is understood as the result of the proper

Table 1. Two-step Index structure and components (source: authors' work)

Dimension 1 Content management on sustainability					Dimension 2 Interaction management		
Step 1 Typology of content disclosed	Step 2 Organization of information				Step 2 Interaction management in the presentation of information		
	Hierarchy of information		Extent of disclosure		Format-interactivity in the presentation of information/ update of information		
	Prominence	*Accessibility*	*Amount of information*	*N° of sections where content is found*			
Sustainability management							
Sustainability performance							

Step 2 Interaction management of website-	
Web tools (sociability)	Information and feedback systems (interactivity)

application of the remaining principles established by Kent and Taylor (1998). In this sense, the dialogic loop is considered the starting point of dialogic communication (Lane, 2020) and includes the interaction between organizations and stakeholders via Internet tools, that facilitate the exchange of information, comments, opinions, evaluations, and experiences. Indeed, when the remaining dialogic principles are effectively managed, the dialogic loop can be initiated, transforming corporate websites into effective spaces for two-way communication.

The method herein proposed combines two key dimensions in the management of communication in digital communication technologies, encompassing the remaining principles of dialogic communication previously mentioned (Kent & Taylor, 1998). The first dimension, *Content Management on Sustainability*, includes the dialogic principles of intuitiveness/ease of the interface and usefulness of information and analyses how disclosed information is organised and structured. This dimension addresses issues related to sustainability management and sustainability performance, information hierarchy, and disclosure extent (Chong et al., 2016; Vollero et al., 2022). The second dimension, *Interaction Management*, compiles the dialogic principles of generating return visits and conserving visitors, and addresses issues related to the formats and interactivity in the presentation of information and update of information. This dimension also examines resources and systems dedicated to website interaction (i.e., web tools – social media widgets, links – and feedback systems) (Capriotti et al., 2016).

3. Research questions

The purpose of this research is to explore the role of websites as key tools for establishing and enhancing relationships in sustainability communication. To this end, a novel measurement instrument, the Two-Step Index, is developed and applied to address the following research questions:

RQ1. Do websites achieve an enough dialogic potential to promote two-way communication on sustainability?

RQ2. Is the level of dialogic potential due to suitable content management on sustainability?

RQ3. Is the level of dialogic potential due to suitable interaction management?

4. Research methods

4.1. Sampling and data collection

A multisector sample was used, consisting of 111 global firms headquartered in Spain, identified through the SABI database. The companies were chosen according to four requisites: (1) belonging to high-risk and low-risk sectors (Chong et al., 2016), (2) being large companies (more than 250 employees), given the role of company size in resource availability for facilitating dialogic communication through websites (Wirtz & Zimbres, 2018), (3) having an active corporate website, and (4) being headquarters in a specific geographical area. The final sample comprised all companies from Andalusia (Spain) which met the selection criteria, with the aim of gaining deeper insight into companies in this region and ensuring the validity of the results.

The unit of analysis is the corporate website. Data were collected during the second half of 2021. Following the methodology of Aguado-Correa et al. (2023), to evaluate the sustainability content, content analysis and evaluation with scoring schemes were applied. First, data were compiled using manual verification of each website by means of observation and

content analysis. Following the coding manual with specific instructions as detailed in Tables 2 and 3, three coders manually collected the data for this research: two independent coders, and one member of the research team. Intercoder reliability, calculated using Krippendorff's alpha coefficient, was satisfactory ($\alpha = 0.85 > 0.80$ minimum threshold). Any discrepancies between coders were examined and resolved by a third member of the research team.

4.2. Operational definitions of dialogic principles

As previously mentioned, the *Two-step Index* incorporates and combines four out of the five dialogic principles defined by Kent and Taylor (1998), as the fifth principle, the dialogic loop, is the result of correctly applying the other principles. This index offers methodological advancements compared to previous approaches in two ways. Firstly, within the dimension *Content Management on Sustainability* (Table 1), the *Typology of content disclosed* is developed using an improved aggregation of the most important categories contained in previous studies (Table 2). Secondly, the measurement instrument contains a two-step analysis. In the first step it measures how companies manage content in the area of sustainability, in terms of whether specific information is or not presented on the website (i.e., *typology of content disclosed* as shown in Table 1). In the second step, for each type of content disclosed, it evaluates how it is organised (i.e., *organization of information* as shown in Table 1) and how companies manage interaction in the area of sustainability, specifically which interaction features are used for the presentation of content (i.e., *interaction management in the presentation of information* as shown in Table 1). In addition, the interaction features present on the website (i.e., *interaction management of website* as shown in Table 1) are also measured.

A two-step coding process was used. Following Table 1, in the first step of coding, within the dimension *Content Management on Sustainability*, the *Typology of Content Disclosed* related to *Sustainability management*, was measured with a dummy variable, indicating the presence or absence on a website of each element listed on Table 2. With respect to *Sustainability performance*, which is further divided into environmental, social, and economic information, its presence or absence was recorded for each category of information as a whole using an ordinal scale (Table 2).

In the second step of coding, within the dimension *Content Management in Sustainability*, the secondary indicators *Hierarchy of information* and *Extent of disclosure* (i.e., *Organization of Information* as shown in Table 1) were measured for each type of content disclosed. Similarly, within the *Interaction Management dimension*, the secondary indicators *Format and interactivity in the presentation of information about sustainability*, and *Update of information* (i.e., *Interaction Management in the Presentation of Information* as shown in Table 1) were assessed for each type of content disclosed. For this purpose, dummy variables were used to indicate whether a given characteristic was present or not for each type of content disclosed, along with ordinal variables with three, four and six categories, as shown in Tables 2 and 3. To determine the level of interaction of each resource used in the presentation of information on sustainability, a value was assigned to the items according to their interaction potential (Table 3) (i.e., including text and graphics (1 = very low), …, and immersive resources (5 = very high)) (Capriotti et al., 2016). Finally, within the *Interaction Management dimension*, for the secondary indicator *Website tools* and *Information and feedback systems* (i.e., *Interaction Management of Website* as shown in Table 1), a dummy variable was used to indicate the presence or absence of each element on a website. To establish the level of interaction of each resource on the website, items were assigned a value according to their interaction potential (Table 3)

(i.e., including contact (downloadable/contact/registration form or explicit company details), FAQs, subscriptions to RSS content services, subscriptions to online bulletins or newsletters (1 = low), ..., and create and publish website content (4 = very high)) (Capriotti et al., 2016).

Table 2. Coding manual. Content management on sustainability dimension (source: authors' work)

Principal indicator	Secondary indicator	Definition	Scale
Typology of content disclosed	Sustainability management	Reference to sustainability in the mission statement/vision statement/values	0/1
		Impact of supply chain/business activity.	0/1
		Code of ethics/conduct.	0/1
		Policies on sustainable development	0/1
		Certificates of sustainability.	0/1
		Sustainable/organic brands.	0/1
		Sustainability document/report.	0/1
		Participation in sustainable organizations/foundations/ associations	0/1
		Awards/rankings/distinctions for sustainability.	0/1
		Existence of a committee/ board of directors in charge of sustainability.	0/1
		Contact information for sustainability issues, devoted to stakeholders	0/1
	Sustainability performance	Information on environmental/ social/economic objectives/ projects/results.	0 no information
			1 information on goals, projects or results
			2 information on goals and projects/ goals and results/ projects and results
			3 information on goals, projects and results
Organization of information	Hierarchy of information	Prominence: Section which contains each type of content disclosed (e.g., the homepage is the most important space).	0 absence
			1 external link to a website about sustainability
			2 other sections of the website
			3 section of website devoted to stakeholders
			4 section "About us/Company"
			5 section of website devoted to sustainability/CSR
			6 homepage

End of Table 2

Principal indicator	Secondary indicator	Definition	Scale
		Accessibility: Information is found quickly (the fewer clicks, the more accessibility and prominence).	0 absence
			1 5 clicks
			2 4 clicks
			3 3 clicks
			4 2 clicks
			5 1 clicks
			6 0 clicks
	Extent of disclosure	Amount of information: Content disclosed (the longer, richer and more detailed the information, the more prominence).	0 absence
			1 1-50 words
			2 51-153 words
			3 154-451 words
			4 more than 452 words
		Number of sections where disclosed content is found.	0 absence
			1 1 sections
			2 2 sections
			3 3 sections
			4 4 sections
			5 5 sections
			6 6 sections

Note: For 0/1 variables, 0 means absence and 1 presence.

Table 3. Coding manual. Interaction management dimension (source: authors' work)

Principal indicator	Secondary indicator	Definition	Scale	Value assigned
Interaction management in the presentation of information on sustainability	Format and interactivity in the presentation of information about sustainability			
	*Expositive	Text and graphic (photos/images and diagrams).	0/1	1 = very low
	*Expositive	Audio and video and link to PDF/ other section of the website.	0/1	2 = low
	*Interactive	Hypertext (links to external site).	0/1	3 = medium
	*Participatory	Interactive resources.	0/1	4 = high
	*Participatory	Immersive resources: virtual/ augmented reality.	0/1	5 = very high
	Update of information on sustainability/CSR	Considers whether content is updated (content after 2018) or valid).	0 no-information	
			1 not-updated	
			2 updated/ valid	

End of Table 3

Principal indicator	Secondary indicator	Definition	Scale	Value assigned
Interaction management of website	Website tools (sociability)			
	*One-way interaction	Downloadable presentations or files.	0/1	1 = low
	*Two-way interaction	Links to blog/s/social networks/ microblogging.	0/1	
				2 = medium
	Information and feedback systems (interactivity)			
	*Passive	Contact (downloadable/contact/ registration form or explicit details of company) and FAQs.	0/1	1 = low
	*Proactive	Company-consumer interaction (subscriptions to RSS content service, subscriptions to online bulletins or newsletters).	0/1	1 = low
				2 = medium
		Consumer-company interaction (blogs, social media and microblogging).	0/1	
		Consumer-company interaction (online chat, evaluate website content and comment on website content).	0/1	3 = high
		Consumer-company interaction (create and publish website content).	0/1	4 = very high

Notes: * Items that form part of a secondary indicator. In these cases, coding strategy is indicated for items with * instead of the secondary indicators, which are not directly measured. For 0/1 variables, 0 means absence and 1 presence.

4.3. Methodology development

The *Two-step index* comprises 45 items divided into four principal indicators, as detailed in Table 1. The content management on sustainability dimension consists of two principal indicators: *Typology of Content* (TC_i) and *Organization of Information* (OI_i). Meanwhile the interaction management dimension *CSI-WQEI*$_{fi}$ *CSI-WQEI*$_e$ includes two principal indicators: *Interaction Management in the Presentation of Information* ($IMPI_i$) and *Interaction Management of the Website* (IMW_i).

CSI-WQEIc The score of each indicator (*Two – step index*$_i$) is calculated as the sum of the scores obtained by the items comprising each secondary indicator, multiplied by the item weight, and divided by the maximum possible score for the principal indicator. This value is then multiplied by 100 using Eq. (1):

$$Two-step\,index_i\,Score = \sum \frac{score\,obtained\,x\,item\,weight}{maximum\,score} \times 100. \quad (1).$$

Cronbach's alpha was calculated to test the internal consistency and reliability of the *Two-step index*; Three items with zero variance were eliminated, reducing the total number of index items to 42. An excellent value (0.98) was obtained (Nunnally, 1978).

The weighting method applied utilised equal weighting, which is suitable when dimensions are balanced and hold equal importance (Bas-Cerdá, 2014).

Subsequently, the global *Two-step Index* was calculated by aggregating the previously weighted indicators comprising Content Management and Interaction Management, as expressed in the following formula (where *i* represents each website), Eq. (2):

$$Two-step\,index_i = \frac{\left[TC_i + OI_i + IMPI_i + IMW_i\right]}{number\,of\,principal\,indicators}. \quad (2)$$

Finally, a descriptive analysis was carried out for each principal indicator, dimension, and the global *Two-step Index*.

5. Results

In response to the RQ1, the application of the Two-step Index reveals that the global dialogic potential is low, with most of the scores failing to reach 20% (Table 4, Figure 1). For the dimensions and principal indicators combined, all results are categorised as low or very low. The *Content Management on Sustainability dimension* scores 24.12%, while the *Interaction Management dimension* falls below 15%.

Within the first dimension, the *Typology of Content* indicator achieves the highest score, 29.35%, while the *Organization of Information* indicator scores 18.88%. For the second dimension, the most notable result is obtained by the *Interaction Management of Website* indicator, scoring 21.73%, compared to the *Interaction Management in the Presentation of Information* indicator, which remains below 7%.

Regarding the global dialogic potential linked to *Typology of Content*, the highest scores are observed for content related to sustainability certificates, information on social objectives, projects and results, sustainable development policies, and information on environmental objectives, projects and results (Table 4, Figure 2).

In conclusion, the analysed websites are not developing a suitable level of dialogic potential to promote interactivity and, potentially, initiate a dialogue on sustainability.

In response to the RQ2, concerning the dialogic potential in the *Content Management on Sustainability dimension* as measured by *Typology of Content*, the highest scores are associated with content related to certificates of sustainability, policies on sustainable development, information on social objectives, projects and results, and information on environmental

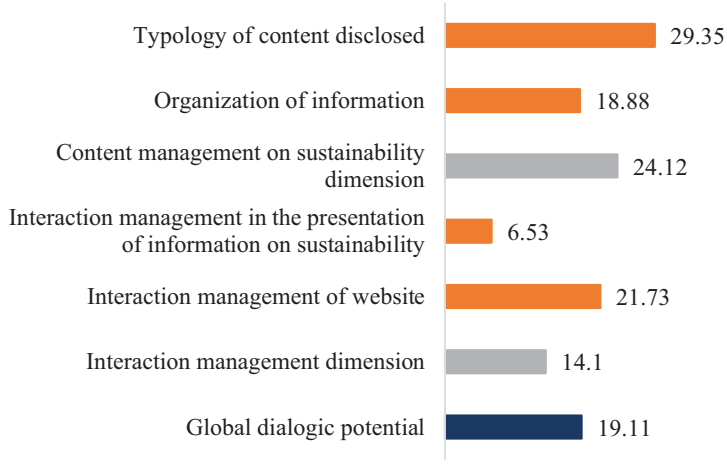

Figure 1. Mean values of two-step index by global dialogic potential, dimensions and principal indicators (source: authors' work)

Table 4. Values of Two-step index for each principal indicator, each dimension and a global measure (source: authors' work)

	Typology of content disclosed	Organization of information	Content management on sustainability dimension (CMS_{cm})	Interaction management in the presentation of information on sustainability	Interaction management of website	Interaction management dimension (IM_{im})	Global dialogic potential (*Two–step index*$_i$)
	Mean (S.D.)	Mean (S.D.)	Mean (S.D.)	Mean (S.D.)	Mean (S.D.)	Mean (S.D.)	Mean (S.D.)
Reference to sustainability in corporate mission statement	33.33 (47.35)	19.04 (27.72)	26.18 (37.32)	4.17 (88.88)	21.73 (13.31)	12.95 (8.51)	19.57 (21.53)
Reference to sustainability in corporate vision statement	23.42 (42.54)	12.12 (22.19)	17.77 (32.31)	2.82 (6.71)	21.73 (13.31)	12.19 (7.66)	14.98 (18.20)
Reference to sustainability in corporate values	36.04 (48.22)	20.51 (27.72)	28.27 (37.89)	5.07 (8.87)	21.73 (13.31)	13.40 (8.379)	20.84 (21.70)
Content about impact of supply chain/business activity	33.33 (47.35)	20.14 (29.20)	26.74 (38.09)	5.65 (10.95)	21.73 (13.31)	13.69 (8.79)	20.21 (21.63)
Code of ethics/ conduct	28.83 (45.50)	13.75 (22.58)	21.29 (33.75)	5.85 (10.49)	21.73 (13.31)	13.79 (8.88)	17.54 (19.76)
Policies on sustainable development	48.65 (50.20)	28.17 (30.13)	38.41 (39.83)	9.50 (11.52)	21.73 (13.31)	15.61 (9.02)	27.01 (23.06)
Certificates of sustainability	71.17 (45.50)	41.89 (28.88)	56.53 (36.54)	13.26 (11.83)	21.73 (13.31)	17.50 (9.02)	37.01 (21.06)
Sustainable/ organic brands	15.31 (36.17)	7.00 (17.35)	11.15 (26.48)	2.33 (6.27)	21.73 (13.31)	12.03 (7.45)	11.59 (15.01)
Sustainability document/report	18.01 (38.60)	9.90 (21.57)	13.96 (29.98)	3.89 (8.77)	21.73 (13.31)	12.81 (8.42)	13.38 (17.88)
Participation in organizations/ foundations/associations that promote sustainable development	35.13 (47.95)	20.92 (29.56)	28.03 (38.44)	9.45 (15.72)	21.73 (13.31)	15.59 (10.90)	21.81 (23.36)
Awards/rankings/ distinctions for sustainability	30.63 (46.30)	17.52 (27.26)	24.07 (36.54)	6.38 (11.03)	21.73 (13.31)	14.06 (9.64)	19.06 (21.81)
Existence of a committee of directors in charge of sustainability	11.71 (32.30)	5.61 (15.74)	8.66 (23.93)	2.08 (6.36)	21.73 (13.31)	11.91 (7.52)	10.28 (14.14)

End of Table 4

	Typology of content disclosed	Organization of information	Content management on sustainability dimension (CMS_{cm})	Interaction management in the presentation of information on sustainability	Interaction management of website	Interaction management dimension (IM_{im})	Global dialogic potential (*Two–step index*$_i$)
	Mean (S.D.)	Mean (S.D.)	Mean (S.D.)	Mean (S.D.)	Mean (S.D.)	Mean (S.D.)	Mean (S.D.)
Information about sustainability devoted to specific stakeholders	16.22 (37.02)	9.37 (21.81)	13.79 (29.29)	3.56 (8.93)	21.73 (13.31)	12.64 (8.42)	12.72 (17.29)
Contact information about sustainability devoted to specific stakeholders	11.71 (32.30)	6.42 (18.05)	9.07 (25.07)	1.18 (4.09)	21.73 (13.31)	11.46 (7.33)	10.26 (14.15)
Information on environmental objectives/ projects/results	36.33 (39.06)	34.43 (32.85)	35.38 (34.85)	13.34 (17.72)	21.73 (13.31)	17.54 (11.57)	26.46 (21.87)
Information on social objectives/ projects/ results	34.23 (35.52)	37.51 (34.48)	35.87 (33.86)	15.97 (19.91)	21.73 (13.31)	18.85 (12.66)	27.36 (21.98)
Information on economic objectives/ projects/ results	15.01 (29.38)	16.70 (28.86)	15.86 (28.07)	6.59 (13.60)	21.73 (13.31)	14.16 (10.31)	15.01 (17.82)
Two-step index Average	29.35 (23.21)	18.88 (14.88)	24.12 (18.97)	6.53 (6.08)	21.73 (13.31)	14.10 (7.86)	19.11 (12.17)

Note: S.D. = Standard Deviation.

objectives, projects and results. The remaining types of content in the *Typology of Content* indicator score below 30%. More specifically, within the *Typology of Content* indicator, the content types with the highest levels of dialogic potential include certificates of sustainability, policies on sustainable development, information on environmental objectives, projects and results, reference to sustainability in corporate values, and participation in organizations, foundations or associations that promote sustainable development. The rest of *Typology of Content* indicators display scores below 35% (Table 4, Figure 3).

Regarding the *Organization of Information* indicator, dialogic potential scores generally remain below 50%, even for content types with relatively higher scores, such as certificates of sustainability, information on social objectives, projects and results, and information on environmental objectives, projects and results (Table 4, Figure 3). These results indicate that the sustainability content is not being adequately managed, especially in terms of the organization of information.

With respect to RQ3, the *Interaction Management dimension* demonstrates lower dialogic potential, with relatively balanced scores among different content types; The highest scores

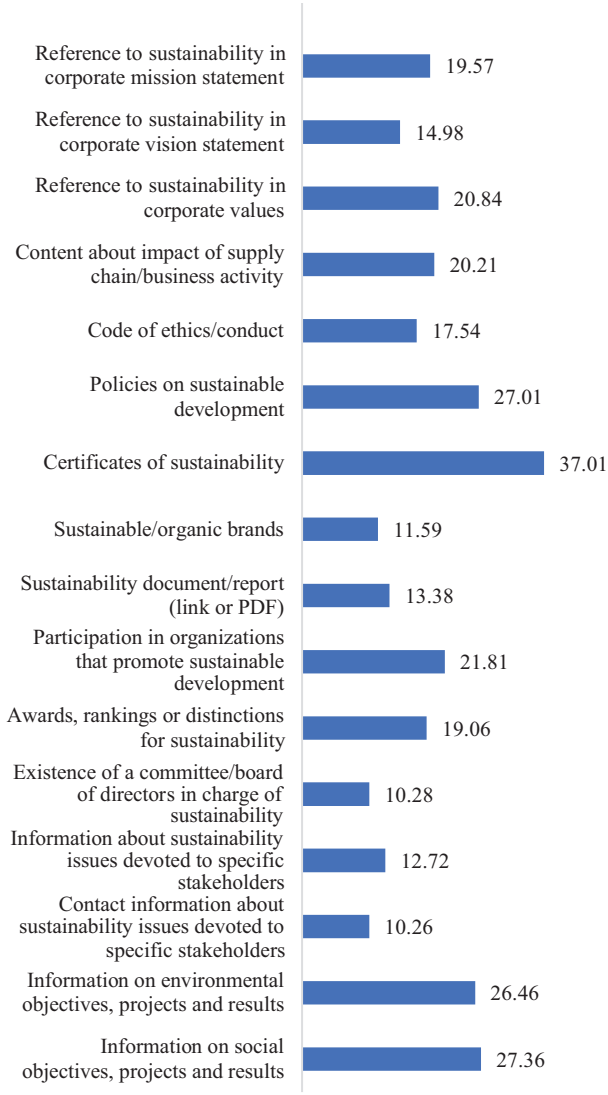

Figure 2. Mean values of global dialogic potential by typology of content disclosed (source: authors' work)

are observed for information on social objectives, projects and results, while the remaining content types score below 18%. In particular, the *Interaction Management in the Presentation of Information* indicator shows notably low dialogic potential, with information on social objectives, projects and results achieving the highest scores. Similarly, the *Interaction Management of Website* indicator displays low scores for all content types (21.73%) (Table 4, Figure 4). Given these results, the interaction is not being adequately managed, especially regarding the presentation of sustainability information. Furthermore, the interaction facilitated by the website shows significant shortcomings, limiting their potential for dialogic communication.

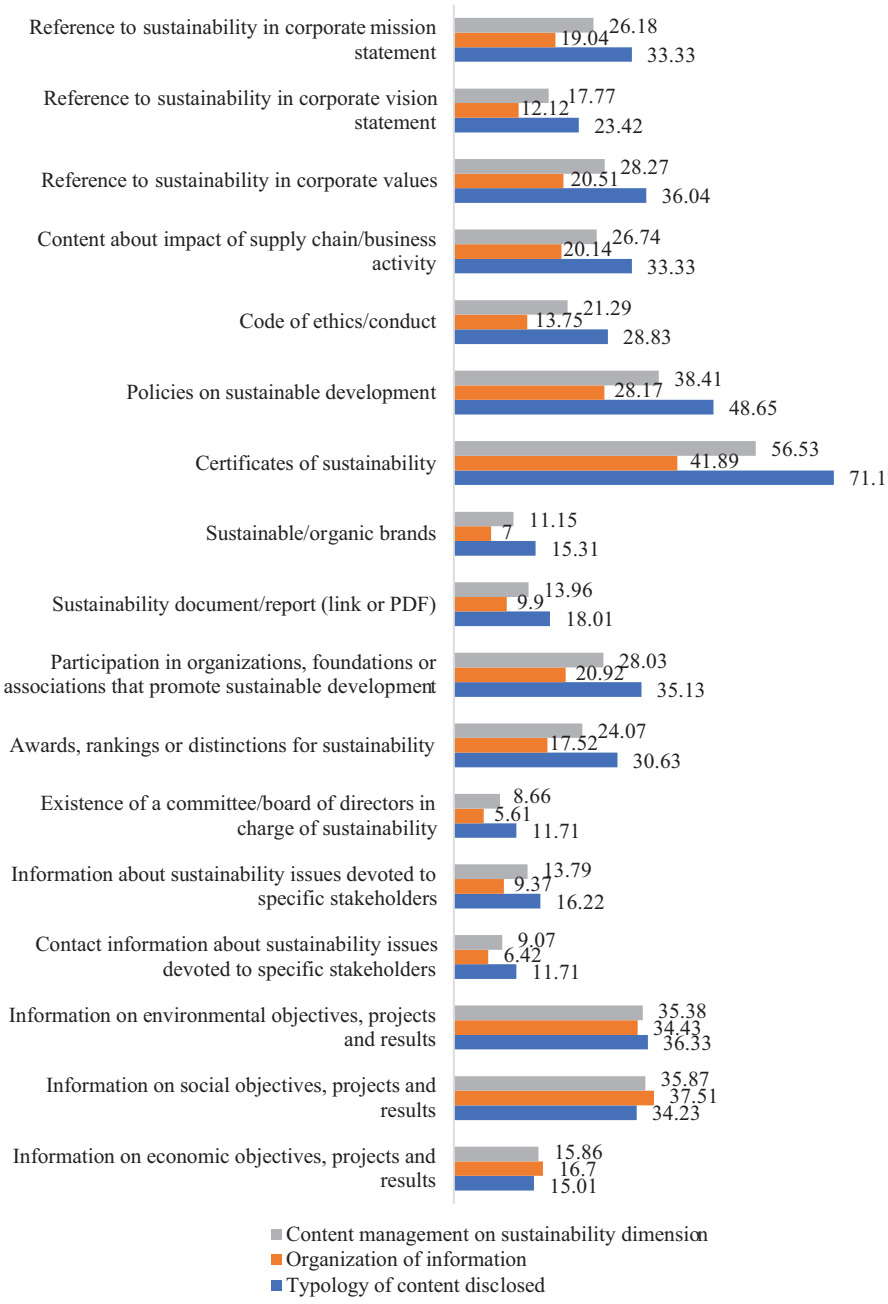

Figure 3. Mean values of the dimension *Content Management* and principal indicator by typology of content disclosed (source: authors' work)

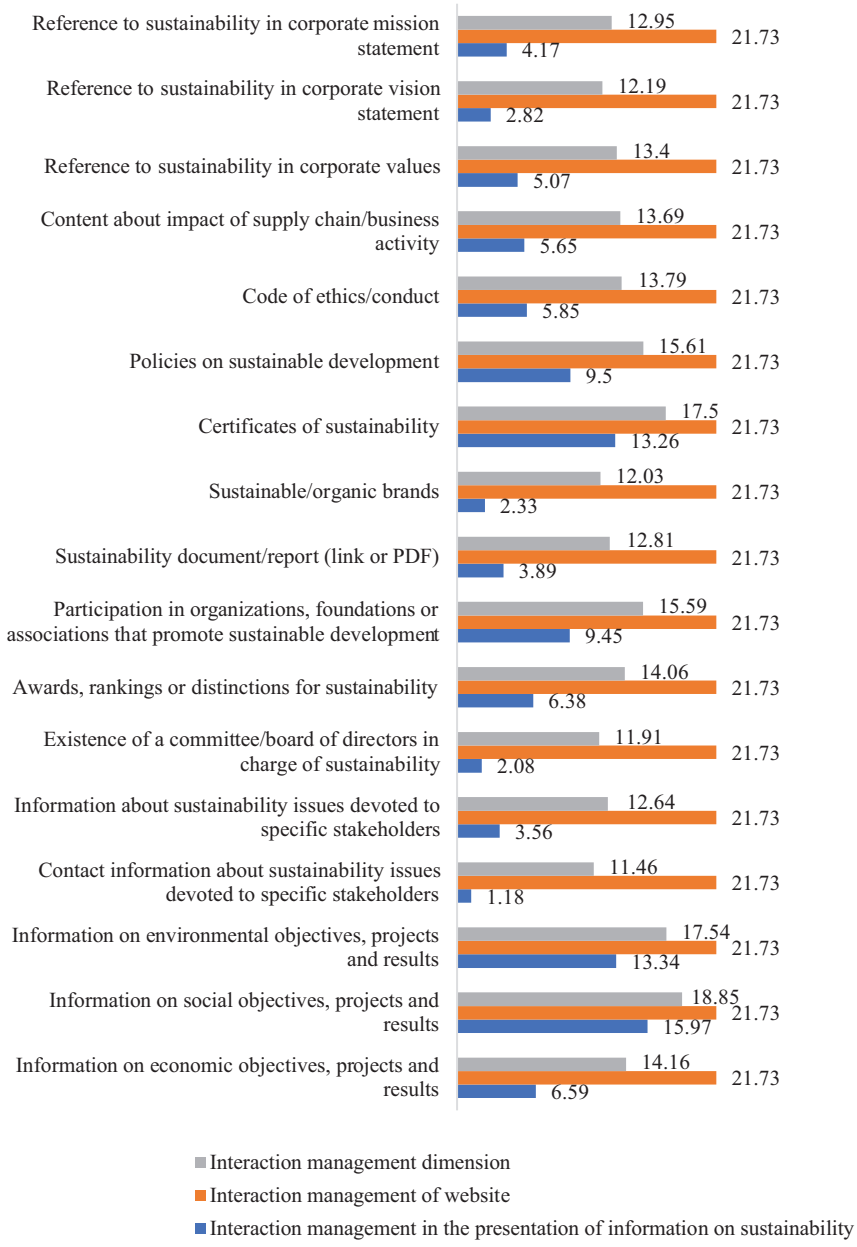

Figure 4. Mean values of the dimension *Interaction Management* and principal indicator by typology of content disclosed (source: authors' work)

6. Discussion

This research highlights that companies are not fully leveraging their websites as interactive marketing tools to foster two-way and dialogic communication, particularly in the realm of sustainability. As consumers increasingly prioritise sustainability issues, companies face the challenge of effectively, transparently, and honestly communicating their sustainable practices through digital media (Dedeoğlu et al., 2020; Ponte et al., 2020). To develop a comprehensive understanding of how dialogic communication can be applied in sustainability efforts, it is crucial to identify limitations and gaps in current practices. The present study addresses this research gap by offering valuable insights into implementing dialogic strategies that foster more participatory sustainability communication through websites.

The findings provided by this research reveal a significant gap between the theoretical insights into dialogic communication strategies and their practical application on corporate websites. While various studies emphasise the advantages of dialogic strategies for communicating sustainability on websites (Dai & Reich, 2023; Uysal, 2018) and highlight factors such as company size as facilitators of this approach (Wirtz & Zimbres, 2018), the analysed websites exhibit significant design deficiencies that hinder effective sustainability communication. These shortcomings align with prior studies indicating that corporate websites often fail to effectively implement dialogic principles (Augusto, 2017; Capriotti & Moreno, 2007; Capriotti et al., 2016; Gómez, 2018; Madichie & Hinson, 2014), underlining the mentioned gap between theory and practice.

A key challenge identified in this research is the inadequate management of sustainability-related content, particularly in organising disclosed information. Despite its critical importance for ensuring digital accessibility (Gleason et al., 2020), companies struggle to present sustainability information in a clear, navigable, and accessible way. This failure undermines the ability to engage users in meaningful and transparent sustainability communication. Additionally, the study highlights significant shortcomings in managing interactions on the analysed websites, which prevent companies from maintaining user engagement and encouraging return visits – key elements for establishing sustained dialogic relationship with stakeholders. Improper interaction management limits the development of meaningful and sustained engagement, a critical factor for dialogic communication (Augusto, 2017; Capriotti & Moreno, 2007; Capriotti et al., 2016; Gómez, 2018; Madichie & Hinson, 2014).

To overcome these challenges, enhancing interactive features and design elements is crucial for corporate websites to move beyond one-way communication and enable participatory exchanges. Interactive designs can create a "dialogic loop," allowing real-time engagement, fostering transparency, authenticity, and trust in sustainability efforts, and meeting consumer expectations.

Several factors may explain the failure to implement effective dialogic strategies on websites. One key reason is that many organizations do not perceive websites as interactive, two-way dialogic tools for sustainability communication, viewing them primarily as vehicles for achieving corporate objectives (Lane & Bartlett, 2016). Additionally, some companies may hesitate to implement dialogic features due to perceived risks, such as misinterpretation or misuse of information (Cardwell et al., 2017). These challenges highlight the need for practical insights to facilitate the effective application of dialogic principles in sustainability communication.

The application of the Two-Step Index reveals significant deficiencies in both content management and interaction management dimensions on the analysed websites. These

findings suggest that companies fail to recognise the website's role as a key relational tool in sustainability communication. Enhancing interactive features and improving website design can foster a more participatory communication approach, strengthening trust with stakeholders through dialogue, collaboration, and value exchange (Tsai et al., 2021).

Ultimately, the study underscores the need for a shift in how companies perceive and utilise their websites in sustainability communication. By recognising websites as dialogic platforms, companies can better respond to consumer demand for transparency and authenticity, ultimately improving their sustainability communication efforts and fostering long-term trust and engagement with stakeholders (Wirtz & Zimbres, 2018).

7. Conclusions, implications and future works

7.1. Theoretical contributions

This study contributes to dialogic theory by underscoring the gap between theory and practice in implementing dialogic strategies for web-based sustainability communication. Identifying this gap is essential for shifting professionals' perceptions about the value of the dialogic communication framework. By providing practical insights into the effective implementation of dialogic principles, this approach highlights the framework as a suitable theoretical model for sustainability communication.

Additionally, this study advances the literature on sustainability communication. The measurement instrument developed unifies and extends the typology of content disclosed on websites, building on prior research in corporate sustainability communication. Unlike previous indexes, the proposed two-step analysis identifies limitations and deficiencies in how companies manage content (*Content Management on Sustainability* dimension) and the features they incorporate to enhance the interactive potential of the content or website (*Interaction Management* dimension). By systematically addressing both content management and interaction management, the Two-step Index offers a robust framework for evaluating the dialogic potential of corporate websites and enhancing sustainability communication practices.

7.2. Managerial implications

This study provides practical insights into the dialogic potential of corporate websites by identifying boundaries and deficiencies in the dimensions analysed. Specifically, it examines how companies utilise the potential of dialogic strategies on their websites for purposes of CS communication, in terms of *Content Management on Sustainability* and *Interaction Management*. This involves understanding what types of content are communicated and how they are presented to initiate and promote two-way communication. Compared to previous dialogic studies, this research offers actionable recommendations derived from the application of the developed index, facilitating the implementation of dialogic strategies on websites.

For sustainability communication to be both effective and ethical, the content disclosed must be varied or rich in content, prominently displayed, easily accessible, feature a suitable amount of content, and capable of enabling two-way communication (Moreno & Capriotti, 2009). Regarding *Content Management on Sustainability*, it recommended to expand the types of disclosed content to meet stakeholders' increasing demands for information. Considering current issues such as climate change and social movements (e.g., Fridays For Future, Me Too) organizations should prioritise CS communication on the following aspects: 1) the impact

of their activities on biodiversity loss; 2) sustainable development policies and detailed corporate responsibility reports; 3) objectives, projects and results related to the climate crisis, such as carbon targets or emission reductions; and 4) human rights, gender equality, diversity, transparency, and economic or financial risks (KPMG, 2022). Additionally, this content should be strategically placed in prominent sections, such as the homepage, or a dedicated sustainability section, and made easily accessible (e.g., with one click). To enhance visibility and engagement, companies should provide richer, more detailed information and include relevant content in multiple sections on the website.

Regarding *Interaction Management*, the results suggest that companies should improve their interactive potential by integrating social web applications, information-sharing features, and feedback systems. These tools can facilitate two-way communication by adapting content to each stakeholder and, in doing so, obtain feedback to develop a dialogic loop. Specific recommendations include: 1) increasing the use of multimedia resources, such as video testimonials, which are highly credible and preferred by stakeholders (Kim & Ferguson, 2018); 2) incorporating interactive and participatory elements such as interactive infographics that users can comment on, rate, or share on social media, and immersive resources like augmented reality recreations and gamification; 3) facilitating website subscriptions, such as newsletters with integrated videos, GIFs, rating systems or surveys; and 4) implementing two-way interaction and proactive resources, including live chat features, rating/comment options, user-generated content publication, and integrated social media resources that foster consumer/company interaction.

By addressing these deficiencies in both content management and interaction features, companies can enhance their websites' ability to support dialogic communication, thereby fostering transparency, trust, and long-term engagement with stakeholders.

7.3. Limitations and future research

The present study has certain limitations that can be addressed in future research. The first limitation relates to the use of cross-sectional data, despite the dynamic nature of online media. Future studies could use longitudinal data to better capture changes over time, although frequent data collection may not be necessary, as websites are less dynamic compared to other digital channels (e.g., social media). The second limitation concerns the sample, which was limited to a specific geographic area and large companies. Future studies could expand the study framework to include diverse geographic areas and include small -and medium-sized enterprises (SMEs). Additionally, future research could explore how stakeholders perceive dialogic communication on websites and assess its effectiveness. Finally, it is recommended to analyse of how companies incorporate the principles of dialogic potential in the context of sustainability in social media.

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Author contributions

All authors have contributed equally.

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