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Designing a Data Visualization Dashboard for Managing the Sustainability Communication of Healthcare Organizations on Facebook

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Abstract: Healthcare organizations are being increasingly requested to publicize their sustainability efforts on digital environments and social media, in part because previously passive patients are now becoming active customers. This paper investigates how leading healthcare organizations are using Facebook to communicate their sustainability, in terms of their focus on different components of the 3Ps (people, profit, planet) and interactive communication strategies used on social media. A content analysis was made of the Facebook posts (n = 6145) of healthcare organizations in the Forbes Global 2000 (2017 annual ranking) from 2015 to mid-2018. Our findings show that the social component of sustainability prevails over environmental and economic issues, although it does not seem to generate increased consumer engagement (in terms of users' likes, comments, reactions, etc.). A data visualization dashboard was developed to help managers in benchmarking competitors and assessing how they can increase response rates and public engagement on social media, thus encouraging the active participation of users. The study also provides useful insights for communication managers in identifying how to use deliberative tools to develop consumer relationships on social media and aligning companies and consumers regarding shared sustainability themes.

Keywords: sustainability communication management; data visualization dashboard; healthcare organizations; social media; user engagement; managerial dashboard

1. Introduction

Corporate social responsibility (CSR) is a key factor in the dialogue between companies and their stakeholders and is continually gaining importance in the corporate agenda [1–3]. This is particularly true of highly competitive sectors, such as the healthcare industry and private hospitals, where the quality of service and customer relations are crucial and CSR is a means to enable companies to differentiate their marketing performance [4–6]. More generally, CSR refers to the integration of traditional business objectives (e.g., shareholder profits) with concerns related to sustainable development, which have an effect both on environmental and societal issues. Healthcare organizations contribute directly to the United Nations Sustainable Development Goals (UN SDGs), especially in terms of achieving the targets related to Goal 3 ("ensuring healthy lives and promoting the well-being for all at all ages"), and can also play a role in other goals, such as the use of clean energy and the promotion of sustainable production and consumption patterns.

Healthcare organizations are thus pushed not only to invest in initiatives aimed at improving the sustainability of their activities, but also to clearly communicate these efforts to the public. The digital revolution has expanded the means through which companies can have a dialogue with their stakeholders, and social media have rapidly gained a prominent role. At the same time, patients have become empowered

through online information [7]. Healthcare organizations are continuously exposed to public scrutiny due to the social importance of their services [8]. Healthcare companies are thus expanding their media mix in order to include social media channels to engage their public and reinforce their sustainability efforts [9]. Sustainability communication is also likely to have positive effects on reputation and loyalty, derived from the enhanced social legitimacy generated [10,11]. This is mainly due to the public's understanding of the value that healthcare organizations (in their role as scientific institutions) add to society, i.e., their sustainability communication can help in increasing the public's positive perception of their scientific contribution in solving health problems (as well as the perception of the high "cost of science") [12]. In fact, informing the public of how healthcare organizations approach sustainability increases positive perspectives of their role in society, especially if social media (such as Facebook) are used to highlight their scientific contribution to the well-being of society [9].

The paper thus draws attention to the communication issues of healthcare organizations that emerge from communicating sustainability on social media. To date, studies on the use of social media in healthcare management have focused on the public's response to institutional communications regarding healthcare interventions [13]. To fill this gap, this paper therefore investigates how leading healthcare organizations are using Facebook to communicate their sustainability, in terms of their focus on the 3Ps (people, profit and planet) and interactive communication strategies used on social media, aimed at meeting different patient expectations.

The paper analyzes longitudinal Facebook data (6145 posts) from the biggest organizations in the healthcare sector (according to the Forbes Global 2000) and presents a data visualization dashboard that allows an in-depth exploration of different sustainability communication efforts, thus providing benchmarks for various communication approaches and engagement results. In this sense, the study aims to contribute to the definition of an overall framework of CSR communication actions adopted by healthcare companies on Facebook. The underlying rationale is to provide a managerial tool that monitors competitors and helps managers in setting effective strategies to increase patient engagement. The study focuses on the use of Facebook pages because the news published by the selected sample of healthcare companies on this platform is generally more up to date and elicits more user feedback, compared to other social networks (e.g., Twitter) [14]. In addition, Facebook is one of the most used platforms in the healthcare sector [15].

Section 2 describes the role of sustainability communication in the healthcare sector, then the review of literature focuses on the opportunities and challenges in using social media for communicating organizations' sustainability efforts. Section 3 describes the methodology employed for collecting and analyzing data. Then, the findings of the analysis are presented showing the main elements of a data visualization dashboard for managing sustainability communication on Facebook by healthcare organizations. Section 5 deals with the findings and concludes by highlighting the managerial implications of using such a tool for the management of sustainability communication in the healthcare industry. Finally, Section 6 discusses the limitations of the paper and suggests directions for future research.

2. Literature Review

2.1. Sustainability Communication in the Healthcare Sector

The need to make healthcare organizations more "sustainable" has been widely debated [16–18]. The healthcare industry must behave responsibly as it faces growing needs from stakeholders, increasing costs of medical technology, and higher patient demands [19]. The healthcare sector represents a complex sustainable system, defined as: "a system of interacting approaches to the restoration, management and optimization of human health that has an ecological base, that is environmentally, economically and socially viable indefinitely, that functions harmoniously both with the human body and the non-human environment, and which does not result in unfair or disproportionate impacts on any significant contributory element of the healthcare system" [20].

The complexity of healthcare services is compounded by the continuously increasing multiple stakeholders, including patients, healthcare providers, politicians, managers, co-workers, front-line staff, directors, and policy makers [21,22]. Hospitals have to embrace CSR and develop stronger relations above all with their community, in order to become more effective at improving health services [8,23] and in achieving the targets for United Nations SDGs.

It is thus essential for healthcare firms, as professional service providers, not only to engage in sustainability issues, but also to ensure that information on CSR is appropriately communicated to the public. In fact, healthcare organizations are under considerable public and media scrutiny, and due to the importance of the services offered, they are socially more visible [24,25]. For this reason, they are more aware of the key role of sustainability communication to respond to ethical standards, strengthen stakeholder relations and create shared value [26,27]. Indeed, it is generally acknowledged that sustainability communication enhances a company's CSR credibility, as well as strengthening reputational capital and social legitimacy [3,10,28]. This also has positive effects in ensuring recognition of the scientific activities carried out by health organizations.

Given that healthcare organizations are conscious of the relevance of CSR, they are more committed to sustainability communication [29], in order to preserve a corporate "license to operate" [30]. According to Faezipour and Ferreira [4], the 3Ps (people, profit, planet) need to be the key elements in any sustainable healthcare communication in order to deal with stakeholders' demands and, at a higher level, to improve quality of life by ensuring and promoting healthy strategies for people of all ages (as stated in UN Sustainable Development Goal 3).

Sustainability communication related to the economic pillar regards information on financial security, such as the fair trade and efficient allocation of resources [4,31], business issues, the cost of the services offered to patients and those provided by the government and insurance organizations. The environmental issues concern energy usage (consumption and cost), the ecological footprint, environmental efficiency and the energy waste. This pillar also includes information on regulations and policies for environmental protection established by the government [32].

The social component of CSR is the main area of disclosure in healthcare sustainability communication [4]. This component focuses on the relations with all stakeholders and deals with empowerment, engagement, human rights, and social identity. Patient satisfaction is an important element in social sustainability and is related to patient well-being, effectiveness of services, staff efficiency, accessibility to resources, ethical behavior, safety of patients, and equitability [33].

Given that the sustainability challenge includes all of healthcare, such as acute care medicine, public health practice and policy [34], the effective use of sustainability communication is a means to improve patient satisfaction [35] as well as to address emerging healthcare issues, such as the challenge of being positively recognized for their scientific activities.

2.2. Sustainability Communication of Healthcare Organizations on Social Media

Companies have to make their CSR activities visible to stakeholders in order to be considered as "socially responsible" [36–38]. To this end, besides communicating CSR commitment using traditional means (such as sustainability reports, codes of ethics and certification standards), healthcare industries are increasingly active in adopting digital technologies [39].

Social networks have a strong potential for healthcare organizations, as they can be used to share updated information on CSR initiatives and enable an ongoing dialogue and interaction with stakeholders [15,40]. Companies also usually set up CSR-dedicated spaces on social networks in order to connect with stakeholders for a wider discussion on CSR, gather feedback, as well as strengthening their visibility and CSR image [41].

Increasing corporate legitimacy and stakeholders' awareness of a company's sustainability entails a two-way communication between the organization and stakeholders [42,43]. Such a dialogue enables firms to understand stakeholders' expectations in CSR and allows stakeholders to have an overall view of CSR corporate commitment. Crane and Livesey [44] affirmed that "stakeholder dialogue on

CSR is very much a two-way process of communication and negotiation" (p. 167), which can lead to stakeholder engagement in CSR initiatives [45–47].

Approximately 70% of U.S. healthcare companies have adopted social networks as part of various community engagement activities related to CSR issues, such as patient education, fundraising, customer service, and support [15]. Research on corporate communication through social networks have typically analyzed companies' use of Facebook [48,49]. This platform allows stakeholders to respond to a company's posts through different tools, such as likes, shares and comments, which engender interactive systems of organizational action [50]. A healthcare company on Facebook can create a corporate account to communicate corporate news focusing on the 3Ps (people, profit, planet) and information on community initiatives [51].

Furthermore, the use of social networks in healthcare firms creates a forum for community engagement and patients' participation, giving them the opportunity to interpret and integrate ideas on corporate actions [52]. Social media, in fact, foster patients' autonomy in complementing the information provided by healthcare professionals, generating new content and sharing experiences [9,53]. These platforms therefore lend support to the patient empowerment, as they encourage patients to become active participants in healthcare management and to take a proactive approach to healthcare decisions, also in terms of CSR issues [7,54,55]. Indeed, with the development of user-generated content, company communications are seen as more patient controlled and patient/consumer needs centered [56].

The inclusion of clients/patients in CSR initiatives within digital environments can thus affect companies to be more accountable in their activities, which may limit stakeholder skepticism [57,58]. Social media use by patients can also provide healthcare organizations with a tool to strengthen the corporate market position, obtain a value co-creation relationship, and engage consumers to be their CSR advocates [30,59].

Despite the growing attention on sustainability communication on social media, there are few empirical studies that highlight how effectively healthcare organizations communicate on social media, in particular Facebook. The main question of this exploratory research explores the communicative initiatives of large healthcare companies. It can be used to have an initial but comprehensive representation of Facebook usage in the sustainability domain. Our research also provides insights to support managerial decisions on communicating sustainability efforts on social media in a complex and rapidly changing scenario.

3. Materials and Methods

To explore how healthcare organizations communicate their sustainability efforts on their corporate Facebook pages, a research design based on content analysis was developed. Content analysis (both qualitative and quantitative) is a non-invasive method to examine recurrent patterns in communication in a systematic and replicable manner [60].

In order to provide significant insights and make replicable inferences about the communication content, content analysis has been widely adopted in research on corporate and marketing communications [61–63].

Content analysis enabled us to investigate the role played by social media in sustainability communication of healthcare organizations and to identify how the three different components of sustainability (economic, environmental and social) have different effects in terms of social media engagement (measured through the interactions, comments and sharing behaviors showed by social media users).

Our unit of analysis was the official Facebook pages of the healthcare organizations included in Forbes Global 2000 in the annual ranking of 2017. The Forbes Global 2000 is a ranking, issued annually since 2003, which includes the top 2000 public companies in the world by Forbes magazine. The metrics considered for being included in the ranking are sales, profit, assets and market value.

The Forbes Global 2000 is a worthwhile indicator of which are the leading public companies in the world, and thus it seems reasonably appropriate for investigating the healthcare industry. We firstly selected all the companies included in the ranking (12) and then checked if their Facebook pages

were active in the last three years. A total of eight companies were selected for the final sample (see Table 1). They are all large companies and are all based in the USA, except for two firms: DSM and Ramsay Health Care. The services they offer include medical care services, integrated pharmacy management services, nutrition and health devices. Three private hospitals (Universal Health Services, Ramsay Health Care, HCA Holdings) were part of our sample thus offering a more focused perspective on patient services.

Table 1. Company profiles. Source: based on data from Forbes Global 2000 (www.forbes.com/global2000).

Company	Foundation	Country	Sales ($ B)	Number of Employees	Type of Activity/Services
Cerner	1979	USA	5.2	26,000	Health care information technology
DaVita	1994	USA	13.4	74,500	Medical care services (dialysis services)
DSM	1902	The Netherlands	10.4	21,054	Nutrition, health devices
Express Scripts	1986	USA	100.2	26,600	Integrated pharmacy management services
HCA Holdings	2010	USA	44.4	253,000	Hospitals
Quest Diagnostics	1996	USA	7.7	45,000	Diagnostic testing, information and services
Ramsay Health Care	1964	Australia	6.8	60,000	Hospitals
Universal Health Services	1978	USA	10.5	76,600	Hospitals

We collected data from 1 January 2015 to 31 May 2018 in order to analyze the context in a longitudinal way.

Once the companies had been selected, by querying the Facebook Public API we collected a total of 6145 Facebook posts. For each one of these we obtained the following data: textual caption, if any; type of post (photo, status, video, link, live); date and time; and link name (i.e., the meta-title of the link attached in the caption, if any). We also collected the number of responses to each post in terms of comments, shares, likes and any other of reactions possible on Facebook (i.e., the five emojis that Facebook added in February 2016—Love, Haha, Wow, Sad and Angry).

To detect sustainable contents in our dataset, we drew up a pattern-matching procedure [64], adopting and extending the glossary in [65–67] to define three kinds of sustainable content: environmental, social and economic in the companies' strategies. To verify the reliability of our method, we calculated the agreement on a small subset of posts between automatic classification and classification made by a trained research, resulting in a good level of agreement (Cohen's Kappa > 0.6). The classification of concepts and terms related to each dimension of sustainability derives, in fact, from the integration of different contributions in the field of CSR communication that deal with the terminology of the 3Ps. Each P has its own associated terms—Profit: business, jobs, revenue, fair trade, etc.; People: respect, human rights, health and safety, community, etc.; and Planet: pollution, environment, climate change, eco-friendly, etc.

As a result of our analytical process, we developed a performance dashboard [68], in order to monitor and analyze competitors in terms of the benchmarking activities and help decision makers in designing new strategies. This dashboard translates the strategies into concrete measures [69] and can be used to continuously refine the strategies, by exploring their results longitudinally.
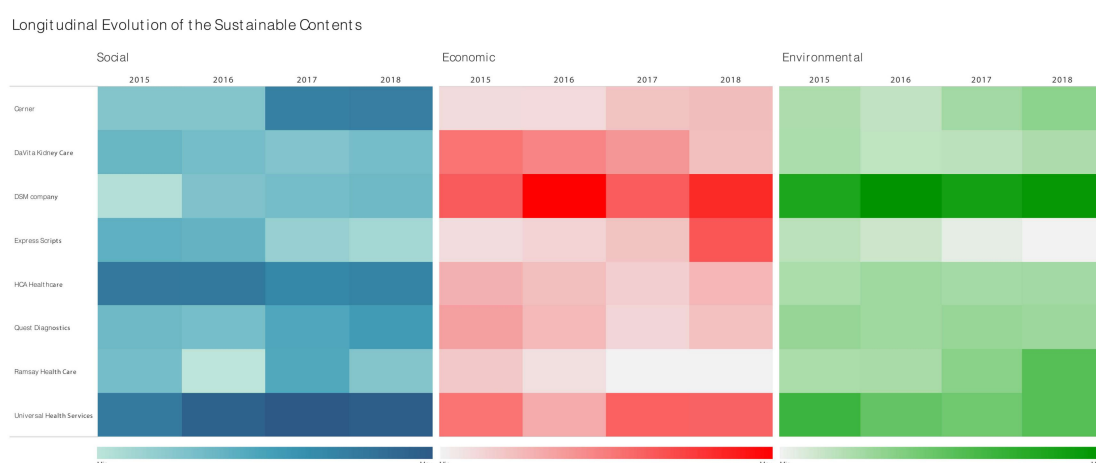
4. Results

Table 2 shows the distribution of the posts for each company. The last column shows that the content related to the three sustainability dimensions is over 50% for all the companies, ranging from 59% (Ramsey Health Care) to 91% (Universal Health Services).

Table 2. Distribution of the posts for each company per year and percentage of sustainable content.

Company	2015	2016	2017	2018 (January–May)	Total	"Sustainable" Content
Davita (Kidney Care)	528	538	565	179	1810	66%
Quest Diagnostics	353	405	343	113	1214	66%
DSM	149	150	326	94	719	76%
Cerner	119	114	322	156	711	75%
HCA Holdings (HCA Care)	129	196	213	94	632	83%
Universal Health Services	66	78	180	117	441	91%
Ramsay Health Care	135	97	71	16	319	59%
Express Scripts	132	120	40	6	298	63%

We then developed a full interactive dashboard, a tool generally acknowledged as an effective support in assisting decision making in business contexts [70]. The goal of this interface is to quickly identify trends and patterns [71] and to improve the information flow mechanisms, with the option to update results without intermediate phases of data refinement [72]. In this dashboard, data can be explored and filtered, and the sustainability strategies, and content strategies can be compared.

To highlight the functions of the tool, we show the views in separate figures. The heatmap [73] in Figure 1 shows the density of the sustainable contents throughout the year for each company and for each type of sustainability dimension examined.

Figure 1. Heatmap: frequency of publication for each sustainability dimension year by year for each company.

This dashboard can be read in several ways: top down to compare the companies in each year for the various fields, and from left to right to observe the trends and evolution of the companies' behaviors. In addition, it is possible to have an overall perspective of the sustainability content for each dimension or for each company. For instance, from left to right it is possible to view:

- DSM in the last two years has shown an increasing rate of sustainable content in the economic and environmental fields, while it remains stable in the social field;
- Universal Health Services has the highest level of social sustainability.

Each kind of sustainability is represented with a different color: social is blue, economic is red and environmental is green. Horizontally, for each company, the dashboard shows the level of coverage of sustainability content for each year on a graduated scale; for example, content related to the social dimension ranges from light blue (minimum value—0%) to deep blue (maximum value—100%) (see legend at the bottom of Figure 1).

An overall perspective highlights that the most "covered" sustainability field is social. Environmental issues have a good level only for a few companies, such as DSM. A top down reading

reveals that the results are not stable and that there is an important turnover between the companies in the top 3.

Figure 2 focuses on strategies using a grouped stacked bar, which divides a strategy in four colors: photo, link, status and video.
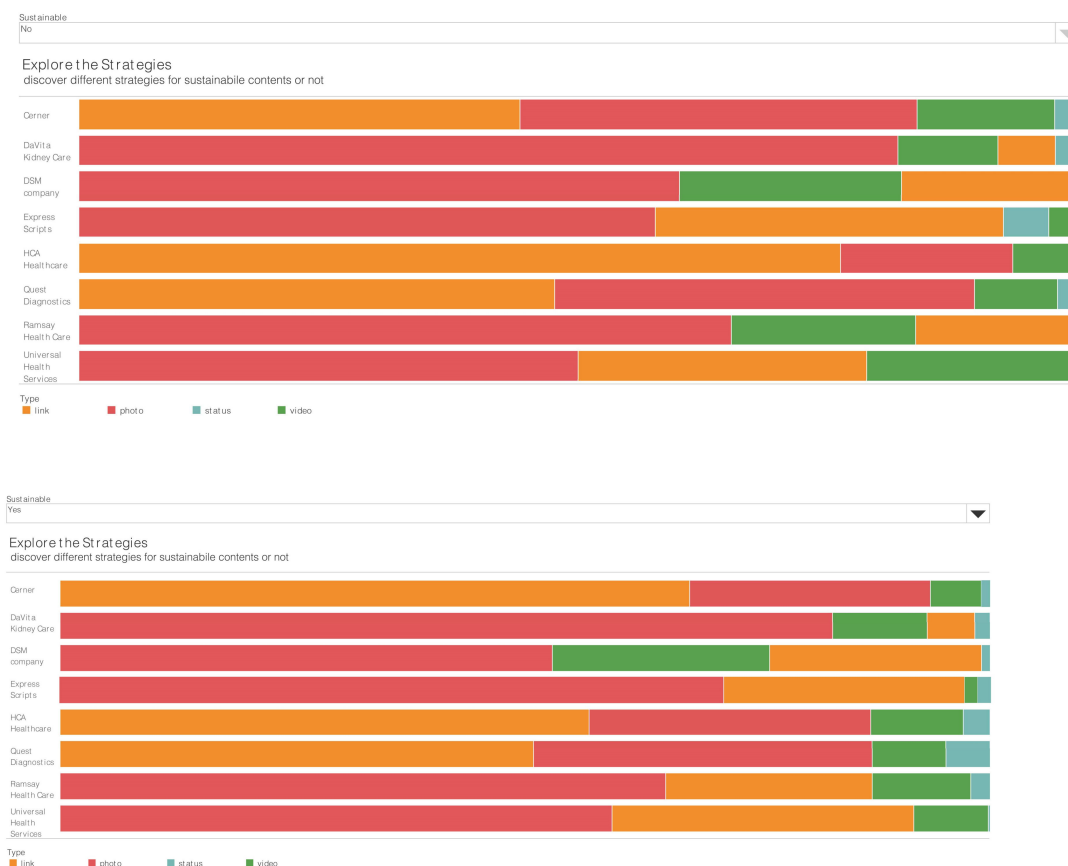

Figure 2. Interactive Stacked Bar: Facebook content strategies for sustainable content.

The upper filter enables viewers to explore the different parts of each typology when the contents are "sustainable" or not. This kind of view reveals different communication approaches, probably more institutional for the companies with a large proportion of "links", and a smarter approach for most companies that prefer to use visual contents (photo and videos). Textual contents only (i.e., status) have a minimal frequency.

Focusing on the coverage of the three different kinds of sustainable content reveals that the social content has the greatest coverage (91%), followed by environmental (26%) and economic (12%). Note that some posts relate to more than dimension. The Venn diagram shows the overlap between the three types of sustainability content (see Figure 3).

The data on users' responses mean that the effects of posts can be assessed with a different focus on sustainable content. Our measurement regarding the engagement of content, as the mean number of interactions (interaction mean has been calculated as the mean number of comments, number of shares, number of likes and number of reactions), shows that the posts in the environmental field are the most engaging (mean 223) followed by economic (mean 179) and social (mean 139).
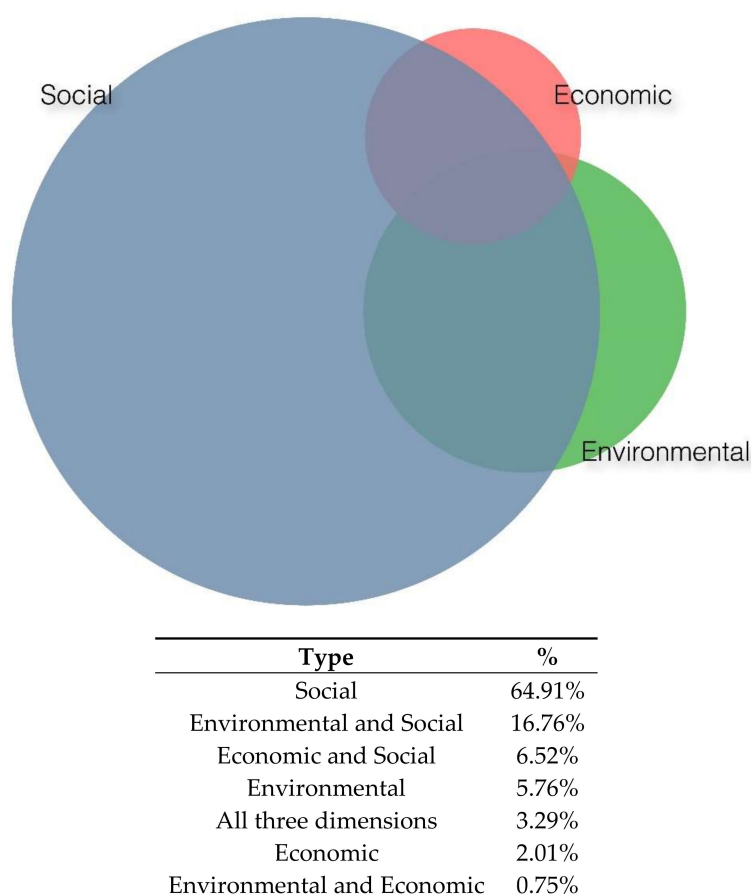
Type	%
Social	64.91%
Environmental and Social	16.76%
Economic and Social	6.52%
Environmental	5.76%
All three dimensions	3.29%
Economic	2.01%
Environmental and Economic	0.75%

Figure 3. Venn diagram of social, environmental and economic sustainability content.

Table 3 shows the top engagement posts distinguished by type of sustainability topic. Posts related to the social dimension refer to the organizations' efforts to improve people's quality of life.

Table 3. Top Engagement posts by type of sustainability issue.

Post	Sustainability Dimensions
Fortune Magazine: 'DSM is in the business of improving the planet and the lives of people on it'. Read now the article & interview with our CEO Feike Sijbesma about our transformation, activities and why we were named #2 on the fortune #changetheworld list.	SOC + ENV + ECO
Eating healthy foods and talking to a dietitian is important for people with kidney disease. Check out these top 15 healthy foods that also happen to be kidney-friendly	SOC
A few inspirational people prove science changes the world for the better	SOC
Urgent action on #climatechange & plastic pollution in the oceans is necessary. Learn more about how we support the ocean cleanup with our innovative material dyneema. Watch the video . . .	ENV
Climate change is one of the biggest social and economic risks the world faces today, and companies and investors are already being affected by the transition to a low carbon economy . . .	ECO + ENV
(. . .) Africa improved foods is a new multi-sectoral, public-private partnership that is feeding the people of Rwanda and feeding economic growth at the same time.	SOC + ECO

Content concerning environmental issues focuses on activities related to climate change and pollution reduction, while posts with economic intent refer to the growth of corporate business and the fair and efficient allocation of resources.

In this other view of the dashboard, each company is represented by its logo, and is located in hierarchical order top down and left-right in terms of interaction mean. At the top there is a filter for exploring the data year by year. In 2016 the best company in terms of interaction mean was Cerner. From 1 January 2018 to 30 May 2018, instead, DaVita Kidney Care reached the greatest mean number of interactions. We generally assume users' interactions as positive, mainly because

negative emoji (e.g., sad and angry reactions) are very limited in number, and other reactions (likes, comments and shares) are generally interpreted as favorable interactions. Figure 4 shows the overall ranking plus additional information, such as number of posts, by hovering over the logo.
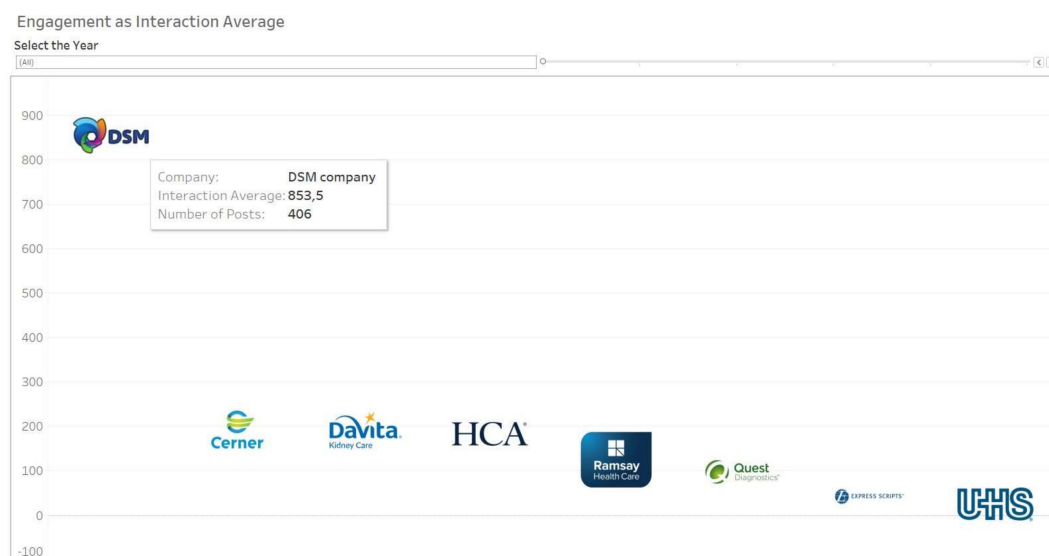

Figure 4. Interaction mean for each company (all years).

5. Discussion

The results show that the organizations within the healthcare industry appear to make a conscious effort to share CSR-related content on Facebook, covering most of their online communications. This is particularly evident in large hospitals—in terms of the total number of employees—which appear to be significantly committed to sustainable disclosure (Universal Health Services and HCA Holdings).

From a business perspective, companies involved in the healthcare sector have a strong interest to engage in strategic CSR actions [74], given the critical attention that these firms have attracted from the media, governments, NGOs and the public [75]. Thus, the interest in CSR communication by healthcare organizations responds to the significant challenges this industry faces since healthcare is considered a "controversial" sector that is particularly subject to public debate [25,76]. In fact, healthcare firms are often regarded with considerable mistrust by stakeholders [77], so they need to carefully account for their activities to obtain the credibility of CSR messages [26,27,29] and avoid greenwashing [67]. Reputational risk is one of the main motivations that lead healthcare firms to communicate CSR initiatives [10]. Companies in this industry engage in CSR disclosure on social networks aiming to build strong relationships with their stakeholders, gain legitimization within the community and protect their corporate reputation [3,78].

The research reveals that most CSR content focuses on organizations' involvement in social causes; in particular, the engagement of hospitals in social activities was found to have a high level of importance. This is in line with several authors who affirm that, strategically, companies' CSR messages are congruent with the corporate core business [27,28]. Most of the content related to the topics covered by companies is pertinent to the healthcare firm's mission, i.e., to provide services to people in order to improve the quality of their lives [5,33]. In this respect, studies show that health promotion is an important factor of social sustainability [79].

Interestingly, even though companies are more focused on socially relevant content, the study highlights that user engagement increases when healthcare firms post environment-related information, rather than social information. In fact, consumers today are more sensitive to CSR programs relating to environmental protection and the ecological footprint of companies' activities [80]. Similarly, most research on sustainability in healthcare regards the environmental dimension and concerns energy usage [33]. In particular, the analysis

of posts with the most engagement on Facebook highlights that healthcare companies have pressure to engage in the discussion on climate change and pollution [81].

Above all in a digital context, stakeholder participation is fundamental for developing relations based on value co-creation, in order to obtain a common target of sustainable healthcare [17]. With regard to stakeholder support to CSR issues of a company, stakeholder engagement affects the effectiveness of sustainability communication because it is connected to stakeholders' interest in CSR [27]. Healthcare companies thus need to assess the public's expectations and adjust their CSR actions and communication based on the stakeholders' interests [41].

Finally, our findings show that most companies prefer to use visual contents (photo and videos) in their communication. This could be justified by the fact that multimedia content on Facebook arouses the most feedback and response, in terms of the highest number of shares and comments [41,82], and generates positive stakeholder engagement [7,83]. The literature has also shown that while public healthcare organizations seem to use social media more for mass information disclosure rather than engaging stakeholders in a many-to-many dialogue [84], private healthcare organizations seem to have developed a wider range of CSR communication initiatives in order to engage their public.

6. Implications and Conclusions

The study has both theoretical and practical implications. First, the paper contributes to the ongoing debate on CSR in the healthcare sector, extending the knowledge on communication practices. Despite its critical importance worldwide [29], this industry has not received systematic attention with regard to CSR, above all in the use of social media for CSR issues. For these reasons, we believe that this paper is the first to empirically analyze the phenomenon as a whole, setting a framework of healthcare firms' strategies, actions and behavior in CSR online disclosure.

From a managerial point of view, our findings demonstrate that healthcare organizations exploit Facebook above all to talk about sustainability issues. Thus, the healthcare industry needs to improve the disclosure about efforts and activities undertaken in the field of CSR and develop effective CSR stakeholder dialogue strategies. A major task for managers working within the healthcare sector is to be proactive in using social media, giving relevant attention not only to social causes, but also to environmental disclosure, which emerged from our study as being the greatest driver for user engagement. Developing this CSR communication strategy could allow hospitals to attract and retain more customers who, through word of mouth, could be promoters and ambassadors of companies' CSR actions.

Healthcare firms constitute a complex system featured by fast-paced changes [85] and strong competition between companies. Thus, in this industry, CSR communication represents a means of competition and a key asset for innovation [17,86] which allows firms to differentiate and increase their marketing performance and reputation.

In the light of these considerations, healthcare organizations need to adopt effective tools to better manage this type of communication. Therefore, our data visualization dashboard could enable managers to monitor competitors in real time and come up with strategies to increase the response and public engagement on social media. Our dashboard could also help the decision-makers of private hospitals to develop a digital communication plan for CSR policies, programs and strategies.

Bearing in mind that one of the limits of this study is the analysis of a single social network platform (Facebook), it would be useful to investigate in further research the behavior of companies, and how they are perceived on other social networks.

Lastly, this paper can be considered as a starting point for cross-country comparisons in order to assess if the same pattern holds true in different conditions, also considering differences in national health systems and different sizes of the firms. It would also be equally interesting to further unravel stakeholder reactions to companies' sustainability communication on social media. The exploration of different types of stakeholder feedback by analyzing the main CSR topic and issues of user comments on Facebook, could have positive effects in crafting strategies aimed at encouraging the active participation of users and patients.

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