

Article

An Approach to Exploring Non-Governmental Development Organizations Interest Groups on Facebook

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Abstract: This paper presents an approach for analyzing the stakeholders from various organizations based on their Facebook activity. On a practical level, the proposed approach has been applied in two of the Non-Governmental Development Organizations (NGDOs) with the largest number of delegations in the province of Cadiz: Red Cross Cadiz, and Caritas Asidonia Jerez. The purposes of the research are to describe the management of marketing activities on Facebook; to identify the network stakeholders, their roles in the communication, and the community generating factors; and to position organizations according to their leadership, activity, and popularity in the network. This study used a mixed-methods research design, combining personal interviews and Social Network Analysis (SNA). The SNA provided insights into the various ways the analyzed NGDOs are active on Facebook, the roles they play in communication, and how communities are generated. Moreover, the SNA made it possible to visualize the interactions between organizations and their stakeholders within the Facebook environment using the Gephi software package. Two factors that generate communities were detected in the results: the organization's nature and its geographical location. Moreover, two solutions were proposed to determine the organizations' positioning according to their roles in communication. Consequently, two maps were created, a two-dimensional map with the activity and popularity of the parameters, which shows that just because an NGDO is active does not mean it is popular (in terms of receiving "likes"), and a second three-dimensional graph to which a leadership parameter was added. In this last map, four groups of important actors can be seen, with one group formed by the organizations with the best ratings on the three dimensions, and the other three with a low level of leadership in common but who were different in terms of the popularity and activity dimensions.

Keywords: social network analysis; NGDO; stakeholders; facebook; communication



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1. Introduction

1.1. The Importance of Digital Social Networks in the NGDO Context

As organizations and individuals become increasingly immersed in a virtual environment, digital social networks (DSNs) have emerged as one of the most widely used communication tools. In this regard, the 2021 report by We Are Social and Hootsuite highlighted two critical facts: first, the number of worldwide users of social networks in January 2021 was 4.2 billion, and, second, Facebook is the leading social network, with almost 2.740 million users visiting the site per month, at the beginning of that year [1]. In Spain, 85% of Internet users between 16 and 65 years of age use social networks, representing more than 26.6 million users in the country, with Facebook being one of the most frequently

used DSNs (91%) [2]. Despite other growing networks, Facebook is still the social network with the most users in the world [3]. In addition to this popularity, DSNs offer other advantages, such as the opportunity to network with related people and organizations, to involve a variety of participants in their activities, and to find out what is being said about them on the Internet. These factors make DSNs valuable marketing tools [4–8].

The textual content of DSNs can be enriched with multimedia elements. Together with the interaction, immediacy, and public nature of the conversations, this characteristic means that these tools have excellent potential for the digital public sphere [9]. Moreover, chats generate relevant content for users [10,11]. In this sense, Kaplan and Haenlein [12] defined DSNs as:

“A group of Internet applications based on the ideological and technological foundations of Web 2.0, which enable the creation and sharing of user-generated content” (p.61).

These facts have not gone unnoticed by NGDOs, who see social networks as essential communication tools because the costs involved in using them are low, they do not require a high level of knowledge to use, and they are an excellent way to establish contacts with similar organizations and participants, and to communicate content to donors, volunteers and partners [13,14].

The expansion of social networks worldwide is evident, as shown in many studies concerning different disciplines such as marketing [15–17], management [18,19], policy [20], education [21] and psychology, [22] among others. Most of the studies on NGOs’ Facebook environment have focused on user behavior [23–27] or on the platform’s effectiveness as a communication tool by studying the messages issued by an organization and analyzing comments, shared messages, or posts marked with a “like” [28–33]. However, little research has been conducted on the patterns of interaction between NGDOs’ stakeholders on Facebook to allow us to identify patterns of action in communication or to identify the profiles of the actors in the network. This type of study requires a specific methodological process, known as social network analysis (SNA), to analyze the construction of alliances between network actors. It provides a set of analytical techniques for the formal study of relationships between actors and the analysis of social structures that arise from the recurrence of these relationships. This methodology makes it possible to represent the social networks’ structure and to identify key actors according to their roles [34].

1.2. Stakeholders in NGDOs and Their Relationships in the Online Environment through the SNA

Relationships between stakeholders, who share common purposes and values, encourage collaboration by exchanging and facilitating the delivery of benefits, which reflect these values to the stakeholders. They also promote stability and better long-term planning as the establishment of links between an organization and its collaborators will lead to an increase in service quality and trust, resulting in better results, which, in the non-profit sector, can translate into greater levels of collaboration [35–37]. Sevick and Seltzer (2009) made a similar claim when they concluded that using strategies involving dialogue to create opportunities for participation can produce positive results, such as increasing the number of people interested in interacting, thus leading to the growth of an organization’s social network [38].

Marketers must identify the stakeholders correctly. Stakeholders refer to any group or individual who might affect or are affected by the achievement of the organization’s objectives [39]. These interest groups could be companies, media, public administrations, etc., whose coordination is necessary to achieve their objectives.

In the NGOs sector, a large majority of researchers have agreed that there are two types of interest groups. On the one hand, the beneficiaries of the nonprofit offer, and on the other, those who provide monetary and non-monetary resources [40]. Beneficiaries, broadly defined, are considered to be not only the ultimate recipients of nonprofit activities, but also all those agents, more or less close to them, who assume different roles in the decision-making process (initiators, decision-makers, influencers, or those who provide resources) and can influence the final perception of the organizational actions received.

Resource providers are identified with any individual organization (public or private) that provide money, values, labor, goods, or services to fulfill the organizational mission [41].

Bruce (1995) [42] made the same distinction between audiences mentioned in the paragraph above but named these two groups final customers and intermediaries. Final customers are made up of consumers, business people, patients, donors, volunteers, workers, members of the government, etc. In contrast, intermediary customers are involved in the process and are somehow part of the attempt to obtain a greater number of end customers, for example, government agencies that refer people in need to an NGO.

Sanz de la Tajada (2009) [43] summarized these interest groups, as shown in Table 1.

Table 1. The NGO markets [43].

| Stakeholders | Benefits That Stakeholders Obtain |
|--|---|
| <ul style="list-style-type: none"> – Associated and non-associated individuals – Companies and organizations – State – Government – Supranational organizations – Associations | <ul style="list-style-type: none"> – Moral/ideological satisfaction – Moral satisfaction of its leaders, tax benefits, and business opportunities – Fulfill your obligations – Credibility and benefits – Development and credibility – Moral satisfaction – Provision of services (technical, legal, etc.) – Corporatism |
| <ul style="list-style-type: none"> – Individuals – Ethnic groups – Geographic regions – All the citizens | <ul style="list-style-type: none"> – Satisfaction of vital needs (food, health, religion, etc.) – Feelings of solidarity |

The development of the internet and social media impacts the organization–stakeholder relationship, which can be critical to an organization’s future success [44]. Social media provides organizations with the ability to foster two-way communication and engage the public in dialogue. NGOs’ communication managers find that two-way interaction is often the ideal model for communicating with their stakeholders and making relationships more transparent and accountable [45,46]. Therefore, NGOs could benefit from building relationships with current and potential donors, volunteers, and other relevant stakeholders (e.g., fundraising, volunteer recruitment, or partnership building), as long as they respond efficiently to their information needs.

Organizational social networking activities generate various types of relationships with different stakeholders. Ihm (2019) [47] distinguished three types of ties: flow ties, representational ties, and affinity ties. Flow ties occur when participants send and receive messages, information, or data among themselves. For example, an NPO’s original posting on social media initiates a link between that NPO and a wide range of stakeholders, but when an NPO reports a post from another stakeholder, it also initiates a link between the NPO and the original poster. In turn, stakeholders may respond and interact with the organization’s social networks differently. If an NGO generates more flow links with a wide range of stakeholders, it can promote itself more actively, presenting a positive image to its stakeholders. Stakeholders, in turn, may be more likely to pay attention to the NPO and participate and communicate more on their social media page [33]. Responding directly to a stakeholder’s publication creates a more personal bond with that stakeholder, who sees that his or her activities are not being ignored. It can create a comfortable environment for stakeholders to have conversations. Representational ties are reposting postings from other social media pages, and affinity ties refer to socially constructed relationships, such as “following” and “follower” on Twitter.

Facebook is considered an excellent tool for enhancing communication with stakeholders in the NGO sector. In this sense, most studies have focused on achieving greater engagement, such as the research by Waters et al. and Weberling and Patel [28,48]. They argued that using strategies on posts related to the stewardship concept, such as accountability, information, reciprocity, and relationship building, could influence the success or failure of communication. Other studies that have contributed, drawing on organizational theory to achieve a better understanding of the forms of engagement that organizations emphasize, are the studies by Saxton and Waters, Cambell et al., and Ji et al. [31,49,50]. Despite the importance of NGOs' stakeholder relationships in the digital domain, insufficient scientific evidence has been found on these relationships' behavioral patterns. Organizations are not always aware of the exact composition of the stakeholder networks and structure in social media, nor to what extent stakeholders are passive or active within the network. It requires a specific research methodology called SNA, which aims to understand the structures, their impact and evolution, to describe the relevant relationships and patterns, delineate the flow of resources, and to evince the effects of relationships on actors connected to the networks [51]. In this context, the application of SNA makes it possible to identify the most prominent actors within a given social media network. However, it can also detect others who, although they are not so prominent in the network, can influence the organization's decision-making and are essential in communication because, as Granovetter [52] commented, these weak ties can provide relevant information for a person who may not have found it in their "strong ties" or people with whom they have closed ties. What is also crucial to this theory is the concept of stakeholder salience, which explains what conditions are in place when managers consider certain people or entities as stakeholders [53]. An argument that an entity or person is considered as a stakeholder is that opinion and behavior are more homogeneous within than between groups, so people connected across groups are more familiar with alternative ways of thinking and behaving. New ideas emerge from selection and synthesis across the structural holes between groups [54].

Therefore, combining the mentioned concepts with the SNA methodology might provide a conceptual solution, which would help organizations identify their potential stakeholders from social media. There are studies on social network communities, but they do not go beyond identifying the relevant actors for communication. Some of them have used this methodology to study non-profit organizations and social movements; an example of which is that by Wyllie et al. (2016) [55], who illustrated how the Facebook networks of healthcare-related non-profit organizations could be explored. Bíró, Gulyás, and Kampis [56] analyzed the Facebook pages of social movements and political organizations by considering whether the number of followers, publications, and connections that "like" content are influential factors in reaching people. In this case, it was concluded that these factors were not relevant to the network's growth, but that the communities grew due to more traditional methods. A study by Niaka [57] looked at the involvement of different non-profit organizations in the health sector and considered the usefulness of DSNs to the business sector, such as pharmacies, for improving their marketing strategies.

However, there is a lack of research specifically investigating the use of DSNs by NGOs. We consider it important to deepen our understanding of the relationships between these organizations and their interest groups on Facebook, one of the most widely used social networks. To this end, this paper presents an approach for analyzing the stakeholders from various organizations based on their Facebook activity as the primary objective. Accordingly, we set ourselves the following specific objectives:

- To describe the management of marketing activities on Facebook;
- To identify the communities that are part of the network and describe the organizations or pages that make up the network;
- To detect the community generating factors;
- To identify the pages with the following roles in communication: the most popular, the most active, the most influential, and the leader;

- To position organizations according to their level of leadership, activity, and popularity in the network.

In order to shed some light on these issues, we developed the proposed approach to analyze the structure of the Facebook networks of two of the most important NGDOs in Cadiz: Red Cross Cádiz (RCC) and Cáritas Asidonia Jerez (CAJ). For this purpose, we used a combination of two qualitative methodologies. First, through Social Network Analysis, we gathered information regarding significant patterns in the links established between the Facebook pages of the organizations being studied and other pages. Second, through in-depth interviews with those in the NGDOs responsible for communication at the national, regional (Andalusian), and provincial offices, we gained an in-depth knowledge of their respective organizations' Facebook marketing management activities. These interviews complemented what we learned using the SNA methodology, allowing us to better understand the results obtained regarding the communication activities of NGDOs.

2. Methodology

2.1. *The Interviews with the Leading Communication Managers of the Organizations under Study*

This study adopted an exploratory approach and collected both secondary and primary information. A review of the literature, in-depth interviews, and SNA were carried out. According to Lindell (2017) [58] an obvious disadvantage of SNA is that it fails to capture the individual habits of the network actors since, in this case, we are only dealing with the recognition transactions ("likes"). It implies that other methods must complement social network analysis. Therefore, it was considered convenient to carry out a complementation strategy in the methodology, combining the SNA with in-depth interviews. The complementation strategy used different methods to analyze the same social reality but with independent information and data analysis. The purpose of this strategy was purely additive since it was not so much a matter of seeking convergence or confirmation between the results, but rather to have two simultaneous images that enriched our understanding of the two images that enriched our understanding of the facts [59]. In this way, it was feasible to address the proposed research objectives within the framework of the qualitative approach [60]. This technique aimed to respond to the description of the marketing activities carried out by NGDOs on Facebook (identify the knowledge before developing social marketing strategies on Facebook, the activities carried out, and the evaluation activities). For this purpose, the in-depth interview is an ideal methodology since this technique can be used to cross-check information on different aspects [61].

The following procedure was used to analyze the results of the interviews [62,63]:

- Familiarization with the data: transcription of the data, reading, and re-reading;
- Descriptive analysis. Through an inductive process, this phase of analysis described what the participants said;
- Categorical analysis. The information obtained was classified into common themes that emerged from the interviews;
- Interpretative analysis: Consisted of the elaboration of the results and the conclusions of the research. It was elaborated based on the research objectives, the questions, and the data obtained in the analysis.

The interviewees were selected based on the following criteria: Firstly, they should be responsible for communication on social networks, specifically Facebook, in their action areas. Secondly, the aim was to know the opinion of those responsible for managing social networks at different geographical levels of action, i.e., at local, provincial, regional, and national levels [64,65]. In this way, it would be possible to know how the different managers handled and supervised communication activities on Facebook and their possible relationship when carrying out this management. In this regard, the interviews were carried out with the following heads of communication: the head of the Communication and Image Plan of the Spanish Red Cross in Cádiz, the head of the social network profiles of the Spanish Red Cross in Andalusia, the head of communication at CAJ, the head of communication at Caritas Cadiz Ceuta, the technical secretary of Caritas Andalusia, the

head of communication at Andalusia Coordinator NGDO and the head coordinator of NGDO Spain. These professionals responded to a semi-structured questionnaire whose design was based on the work of Pérez [66]; Arroyo, Balandrón and Martín [67]; and Uribe, Rialp and Llonch [68], and was divided into three parts. The first was related to previous knowledge in two areas, the first being the use of Facebook and marketing strategies in this platform; and the other part referred to the needs and motivations of the stakeholders, since, as Santesmases [69] stated, nonprofit organizations practice marketing the more concerned they are with the needs of their clients. This statement follows that the first step before implementing any marketing strategy is to know who our target audience is, how they collaborate, and why. The questions corresponding to this first block are the following: Do they know how Facebook works? Do they know about marketing strategies through Facebook? Do you know other NGDOs? Which ones? Do you have clear procedures to know how to detect the needs of partners?

The second part concerned the knowledge and application of social marketing strategies on Facebook: the type of marketing activities carried out on Facebook and how organizations carry out institutional campaigns at regional, provincial, and local levels, presentation (text, photo, videos), elements used (events, public acknowledgements, comments, or news), and the advantages and disadvantages of using Facebook. The questions corresponding to this second block were the following: Do you develop engaging activities that motivate people to collaborate? For example, themed events (photography)? What are the main advantages and disadvantages of using Facebook for marketing activities? How do you carry out the elaboration and development of marketing activities on Facebook? Do you collaborate with other social media managers of related organizations? Do you note the strengths and weaknesses of the NGDOs you know?

The third part was related to monitoring these strategies. This last point was considered particularly relevant as it is necessary to record information on the results achieved to check their effectiveness. The questions corresponding to the third block of questions were: Do you have an established procedure for monitoring and evaluating Facebook marketing activities? Do you know indicators for the evaluation of Facebook activities? Do you have a procedure in place for monitoring and evaluating Facebook marketing activities?

2.2. *The Process of SNA on the Organizations' Facebook under Study*

After gathering the information on Facebook's function as a marketing management tool, the next step was to analyze the social networks. SNA on the Internet is a methodology based on Network Theory that scientifically examines complex social structures in the digital environment and facilitates the visualization of network graphs [39]. This technique was deemed suitable for this study for two reasons: on the one hand, it allowed us to identify the constitutive elements of a social network, and on the other, it made it possible to learn how network actors create links with others [70].

There are general assumptions that can be considered as the basic principles of the network perspective. The SNA is based on the conception that a network consists of nodes (individuals or countries) and links (interactions or social relationships). The main focus of the SNA is in the links between the nodes or in the relationships; this means that the characteristics and capacities of the individual nodes are essential [71].

Starting from this central premise, the SNA includes a set of techniques that are based on the following methodological principles [72,73]:

- Assumes a structural intuition of social relations;
- The collection of empirical data must be carried out systematically;
- Mathematical models are a fundamental part of the analysis with the help of computers as tools for their exploitation and visualization;
- Creating and sharing visualizations of relationship and patterns of interactions allow the generation of significant structural insights and their communication to others;
- The structure of the networks is not directly observable in the data but the result of the analysis;

- The networks created by the structure of relationships are not arbitrary;
- Relationships can link individuals as well as groups and organizations.

Collecting data from social networks captures the presence/absence (or strength) of ties between pairs of actors. These relationships can be obtained from archival data (i.e., organizational alliances or email records), interviews, or reports from respondents. In addition, there are social media data [74].

Based on the information above, we assumed that the data collected for the information met the points specified above, as explained in the process of SNA.

The methodological process followed in the SNA for this study is shown below:

1. Determination of the objectives. With the SNA methodology, the following objectives were proposed: to identify the communities that are part of the network and describe the organizations or pages that make up said the network; to detect community generating factors; to identify pages with the following roles in communication (the most popular, the most influential, and the leader); and to position organizations according to their level of leadership, activity, and popularity within the network.
2. Selection of organizations. The selected organizations were RCC and CAJ, as they are among two of the NGDOs with the largest number of delegations in the province of Cadiz. RCC is a non-denominational organization that had 12 local assemblies in 2019, with more than 200 members and 100 volunteers. CAJ has nine archpriesthoods distributed in the area north of the Guadalete River in the province of Cadiz. They are also registered with the Spanish Agency for International Development Cooperation and are considered “qualified” organizations in that they have passed an accreditation process that certifies their experience and capacity. We restricted the scale of our study, as more focused studies can yield valuable insights in particular contexts (small scales). It is essential to know how NGDOs use social networks in a local environment since these instruments can innovatively provide services, external relations, and access to knowledge beyond organizational boundaries. Several studies using the SNA methodology have used a small-scale approach to sample selection. In this regard, the study by Wyllie et al. (2016) [55] is of interest, who found that small-scale SNA in social networks reveals valuable information about relationship management for nonprofit service organizations. Moreover, Tiago et al. (2018) [75] conducted a study to examine the social media strategies of three cruise lines over three years, analyzing the network structures on Facebook and Twitter and demonstrating the value of the STAR (storytelling, triggers, amusement, and reaction) model for improving social media activities. In culture, Lindell (2017) [58] developed a study on the usefulness of Bourdieu’s social theory in digital social network research. To this end, he conducted a case study focused on the Royal Dramatic Theatre in Sweden, whereby he found that a network analysis of a group of institutions in social networks can begin to uncover the breadth or scope of a social field, which, according to the author, is rare in empirical field research.
3. Selection of the social network. The choice of Facebook was motivated by its high social impact, affordability, and ability to generate interactive communication, which are elements that foster relationships with non-profit organizations [76]. It is the social network most used by NGDOs, as discussed in Section 1.1, corresponding to the importance of digital social networks in the NGDOs context.
4. Data extraction. The Netvizz v1.44 module called the “page like network” allows data to be extracted from Facebook, which creates a network of pages connected by the “like” action [77]. The “like” of an official Facebook page is more durable than the like of a post since it is not linked to a specific publication that appears at a particular time but is attached to the page in question (in the section “like” this page). In addition, when the person in charge decides which institutions to “like” on Facebook, he does so on behalf of the organization he represents, so it does not have the same meaning that the likes of a publication may have. The publications’ likes can be ironic, humorous, and even mocking [78]. The likes of Facebook pages are a symbol

of recognition [58]. The crawl was conducted on March 2019 and generated a total of 46 nodes (Facebook pages) and 291 edges (connections, in the form of “likes,” between the pages) in the RCC’s Facebook, and 84 nodes and 775 edges in CAJ’s Facebook.

5. Selection of the metrics. To respond to each of the objectives set out in point 1 of this process, the following metrics were used: diameter of the network, average path length, modularity, degree centrality, out-degree, in-degree, and intermediation centrality. These metrics, together with the objectives for which they are used, are explained in Table 2.

Table 2. SNA objectives and metrics [79–82].

| Objectives | Metrics | Description |
|------------------------------------|------------------------------|--|
| Contextualizing the network | Diameter | It measures the maximum number of links that a node must go through to reach another node in the network |
| | Average path length | Number of steps that on average would have to be taken to get from one randomly selected node to another |
| Identifying stakeholders | Modularity | It measures the density of links in the different network partitions |
| Analyze the most influential pages | Centrality of degree | Measures the communication capacity of each node within the network (communication potential) |
| Identify the most active pages | Out-degree | Number of likes that a page spreads |
| Identify the most popular pages | In-degree | Number of likes a page receives |
| Examining leadership | Centrality of intermediation | The frequency with which a node or an actor is between a pair of other node on the shortest path connected to them (communication control) |

Regarding modularity, it is necessary to indicate that the Leuven modularity algorithm, a method widely used in the literature and applicable to the field of social networks [83], was used to identify the different communities within the networks. The basic idea was to look for regions within the graph where the interconnections between the nodes were relatively dense compared to others in the network. In other words, the modularity of a partition is a scalar value between -1 and 1 that measures the density of links inside communities as compared to links between communities. This value can be represented numerically:

$$M = \frac{1}{2m} \sum_{ij} \left[A_{ij} - \frac{k_i k_j}{2m} \right] \delta(c_i, c_j)$$

where A_{ij} represents the weight of the edge between i and j ; K_i is the sum of the weights of the edges attached to vertex i ; c_i is the community to which vertex i is assigned, and

$$m = \sum_j A_{ij}.$$

The degree centrality, which corresponds to the number of links that a node has with the others, can be re-stated by the following formula [84].

$$C_{DEG}(j) = \sum a_{ij}$$

Position a_{ij} assumes the value of 1 if the edge (i,j) exists and 0, if it does not. It can be defined as two different degree centrality measures for steered networks, corresponding to the input degree or the output degree. With regard to interpersonal relationships, the

first can be interpreted as a measure of popularity, and the second can be interpreted as a sociability measure.

Finally, the centrality of intermediation of a node, which quantifies the number of times a node acts as a bridge along the shortest path between two other nodes, is formally defined through the formula:

$$C_{BET}(i) = \sum_{j,k} \frac{b_{jik}}{b_{jk}}$$

where b_{jk} is the number of shorter paths from node j to node k , and b_{jik} is the number of shorter paths from j to k that pass through node i .

6. Analysis and visualization of results. Once the data were obtained they were examined and visualized using a Gephi version 0.9.2. software package [84] and Rstudio version 4.0.3 [85]. Gephi is open-source software for graph and network analysis to display large networks in real-time, speed up exploration, and produce valuable visual results. It provides broad access to network data and allows for spatializing, filtering, navigating, manipulating, and clustering. The ForceAtlas2 algorithm was applied to organize the nodes spatially in terms of the two opposing forces of repulsion and attraction between the nodes. The nodes that had more connections in common were attracted to each other, and those that did not have connections in common were pushed away from each other [86]. In general, nodes with something in common also “like” each other more often than other nodes, so the ForceAtlas2 design brings them together into groups. Examining the network and these groups might reveal ideas about shared values and interests. Finally, we used the R-Studio program and the Scatterplot3d package [87] to build a 3D map to respond to the objective of positioning organizations according to their levels of leadership, activity, and popularity.

3. Results

3.1. Communication Management on Facebook

The interviews were carried out for exploratory purposes to find out how communication is managed on Facebook in the organizations under study. They allowed the context in which the analyzed organizations operated to be known and to better understand the results obtained with the SNA methodology. These results show the perspective of the leading communication managers related to RCC and CAJ regarding the following issues: the knowledge before the development of Facebook marketing strategies, the implementation of these strategies, and the monitoring and evaluation of these strategies.

Regarding the first question related to knowledge before the development of marketing strategies in social networks, it is necessary to comment that a research process is required on the internal and external situation of the organization, as well as on the stakeholders and the public to whom the messages about the marketing activities will be addressed. In this regard, it should be noted that those responsible for social networks are communication professionals with solid knowledge related to journalism or similar. However, they do not have sufficient specific or technical knowledge of social networks or strategic marketing, especially in setting social media marketing objectives and appropriate indicators to check whether these objectives have been achieved.

Another aspect to highlight is whether those responsible carry out prior research on the characteristics and needs of potential stakeholders (NGOs, companies, public administrations, etc.) for future collaboration agreements. In this regard, it is important to point out that, although similar organizations or others that could be collaborated with are known, there is no in-depth knowledge of their strengths or weaknesses. In other words, no prior research is usually carried out on potential participants. In this regard, it should be noted that they are considered collaborators, not competitors, which is an essential point for future negotiations.

Concerning the collaboration between similar organizations and how they carry out the communication of marketing strategies on Facebook, it should be noted that, both in Red Cross and Caritas, there are institutional campaigns that are shared on social networks at the provincial level. However, there are more specific messages that are more related to local aspects. For example, in the Red Cross, there are messages to raise public awareness about specific campaigns such as health campaigns or road safety tips, which are national in scope and can be adapted to the local environment. All of them describe the work of volunteers with images and videos in specific actions, but there is no communication about the organization itself highlighting its hallmark, i.e., a branding strategy. Concerning the above, it is important to point out that, according to the opinion of the person in charge of the head of coordinator of NGDO Spain, the personality of the person behind the social networks is essential, i.e., an “...institutional bond can be created because you create a reputation through a way of behaving and interacting, a way of saying, a way of denouncing, a way of dealing with issues...”. With this, unknowledgeable people may contact you simply because they know how you act; this is one of the significant advantages of the DSNs. In this respect, it is necessary to continue commenting on the opinion of the manager mentioned above, who states that messages should not be excessively institutional, i.e., they should be closer or more human because “...in the end we are people communicating with people.” In short, according to the results of the interviews, both RCC and CAJ have autonomy in planning Facebook marketing activities, which they can adapt to local needs. The Coordinator of NGDOs Spain recognized two fundamental concepts when it comes to communication in DSNs: one is to show interest in the activities carried out by other organizations and to empathize with them and their users by sharing the feeling that we all live in a common world and what happens to others could happen to us; the other is intelligence in the sense that “... we must offer more questions than closed answers...” In other words, it is important to explain the natural causes of problems to enhance the abilities of the users to form their own opinions and participate. If these implications are taken to heart, then the willingness of the organizations to relate to others by communicating and generating interesting content will increase.

Another issue is about how messages are delivered. In this regard, it is challenging to determine objectives about what content to publish, i.e., the people running the social networks are more concerned with communicating content than generating it. It may be because many of the activities that are carried out to encourage people to collaborate are not designed to be completed through social networks but through offline actions such as street activities, e.g., the “flag day” to raise funds. In this regard, those that are responsible for Caritas Cadiz use these media for informational purposes rather than relations; that is, news or activities that have been carried out both in Cadiz and in other environments related to Caritas are disseminated but they are not used to create conversation or generate content.

Concerning the development of activities on social networks, it is helpful to specify the advantages and disadvantages of these as marketing tools. In this regard, it should be noted that the capacity for dissemination and the fact that they are free of charge are two of the most favorable points, since, according to the comments of the person in charge, it is a way of listening to the volunteers, which encourages dialogue and therefore gives an image of closeness. The lack of experience and knowledge, especially in marketing strategies in social networks, was indicated regarding the main barriers.

Finally, regarding monitoring activities, we would like to comment on the lack of indicators and procedures to follow, as shown in the following information obtained from the interview of the person in charge of communication at RCC.

“The problem is to establish indicators that allow us to plan and give us results”.

3.2. Contextualization of the Networks on Facebook

The resulting RCC network consisted of 46 nodes and 291 edges, and the CAJ network contained 84 nodes and 775 edges. The nodes correspond to the pages connected to the NGDOs in the study, and the edges are the connections produced between them through

in collecting food or toys. Specifically, 46 companies collaborate with RCC [88] and 110 with CAJ [89]. A reason for this was explained by CAJ’s communications manager, who commented that on Facebook she tends to like the posts and not the pages. Another fact to highlight regarding the identified stakeholders is that CAJ has almost twice as many pages in its network as RCC.

3.4. Identifying the Most Influential, Active, and Popular Pages

The degree centrality metric was applied to identify the most influential actors. This is the number of links that the organization has with other pages in the network. Visually, in Figures 1 and 2, which show the size of the nodes, a larger size represents a more significant number of relationships. The five pages with the most connections are shown in Table 4.

Table 4. The five most influential Facebook pages in the networks of Red Cross Cadiz and Caritas.

| Pages | Degree | Out- | In- | Pages | Degree | Out- | In- |
|--------------|------------|--------|--------|-------------|------------|--------|--------|
| Red Cross | Centrality | Degree | Degree | Caritas | Centrality | Degree | Degree |
| R.C. Cadiz | 61 | 45 | 16 | C. Spain | 109 | 75 | 34 |
| R.C. Spain | 35 | 10 | 25 | C. Bizkaia | 93 | 75 | 18 |
| R.C. Granada | 31 | 19 | 12 | C. A. Jerez | 93 | 83 | 10 |
| R.C. Aragón | 31 | 24 | 7 | C. Lebanon | 65 | 54 | 11 |
| R.C. Seville | 27 | 17 | 10 | C. Europe | 49 | 22 | 27 |

As shown in Table 4, the most influential pages are RCC and Spanish Caritas, which had the highest-grade values. Another critical parameter is the in-degree value, which indicates how many “likes” an organization has received from other pages. In the RCC network, the most popular page is that of the Spanish Red Cross, with an in-degree value of 25, and in the CAJ network, the most popular page Spanish Caritas, with an input grade value of 34. However, these were not the most active pages (they did not have the highest out-degree values); those pertained to RCC (45 value in out-degree) and CAJ (83 value in out-degree). Therefore, from the results obtained, it can be deduced that if an organization is a fan of many pages (i.e., it is very active), it does not follow that this will be reciprocated (i.e., that it will become popular). In this context, RCC is supported by 16 organizations (36.36%) and CAJ by 10 (12%).

To check which pages were connected to RCC and CAJ, the graph in Figures 3 and 4 was created using a mutual edge filter.

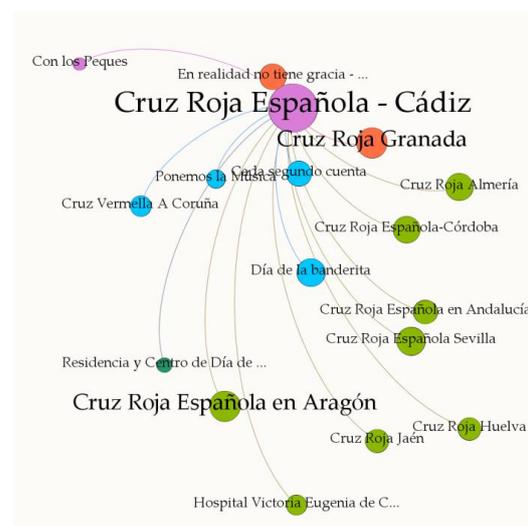


Figure 3. Display of the RCC’s Facebook network with a “Mutual Edge” filter.

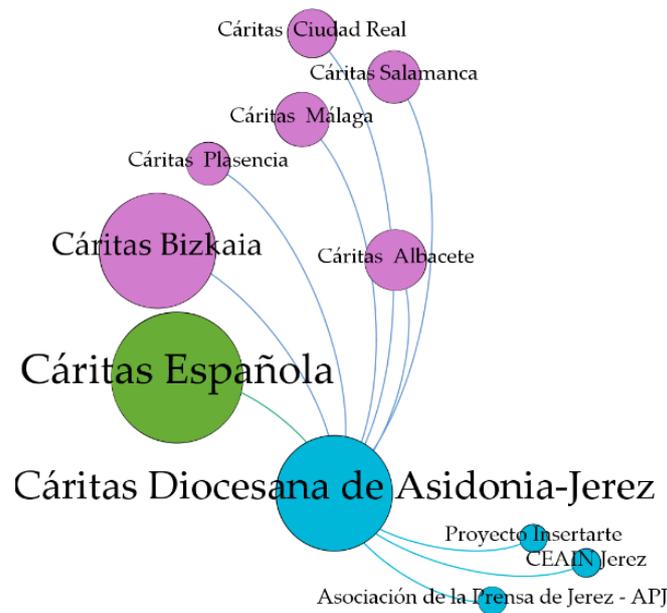


Figure 4. Display of the CAJ’s Facebook network with a “Mutual Edge” filter.

The results show that the pages connected to the RCC included these pages: Aragon Red Cross, Red Cross delegations in Andalusia, solidarity campaigns (such as “Every Second Counts” or “Flag Day”), and the pages corresponding to the local environment as the San Fernando Day Center or the Victoria Eugenia Hospital. The CAJ network was connected with Spanish Caritas, other national delegations (only Malaga in Andalusia), and three pages from the surrounding area (“Jerez Immigrant Center,” “Jerez Press Association,” and the “Insert project”).

To gain a deeper understanding of page activity and popularity, a map was drawn up in which the pages were positioned according to the two dimensions mentioned earlier (measured by the out-degree value and the in-degree value, respectively). The three most active pages of both the RCC and CAJ networks were selected and are shown in Figure 5.

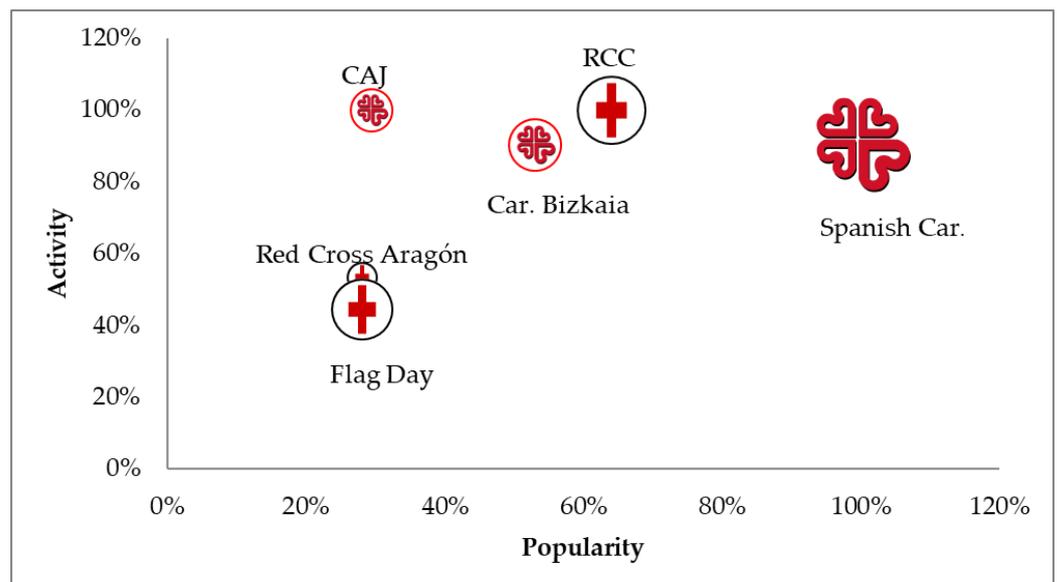


Figure 5. Positioning map according to activity and popularity dimensions.

The top half of Figure 5 shows the most active pages, and the right half shows the most popular pages (a larger size is indicative of a larger number of fans). According to

these criteria, Spanish Caritas is the best-positioned organization, followed by RCC. RCC is one of the most active organizations (higher out-degree), and both (Spain Caritas and RCC) are the ones that have greater support from the pages in their network (higher in-degree). In this respect, it should be noted that CAJ, as it is in the middle left, is not supported by the rest of the organizations (despite being the most active organization in its network).

3.5. Determining Lead Pages

In SNA, the vertices with the highest centrality of intermediation have the most leadership as they control the communication flows. This fact is illustrated in Table 5, where the five leading pages in the networks of the two organizations analyzed are shown.

Table 5. Pages with the highest level of intermediation.

| Pages. | Betweenness Centrality | Fans |
|--------------------------|------------------------|---------|
| Red Cross Cadiz | 608.248 | 6173 |
| Red Cross Spain | 362.262 | 293,986 |
| Red Cross Aragón | 125.786 | 1360 |
| Flag Day | 97.089 | 6759 |
| Int. Feder. Of Red Cross | 96.312 | 505,225 |
| Caritas Spain | 1845.178 | 86,071 |
| Caritas Jerez | 692.058 | 2253 |
| Caritas Bizkaia | 536.553 | 5362 |
| Caritas Lebanon | 477.377 | 20,630 |
| Caritas Europe | 326.045 | 16,280 |

As shown in Table 5, RCC and Spanish Caritas are the leading pages in their respective networks, which means that many nodes need to go through these actors to make indirect connections via the shortest paths. Another page worth highlighting is Flag Day, one of the Red Cross Cadiz’s most popular means of raising funds to help children. If the organizations in Table 5 are evaluated in terms of leadership, activity, and popularity, the ranking in Figure 6 is obtained.

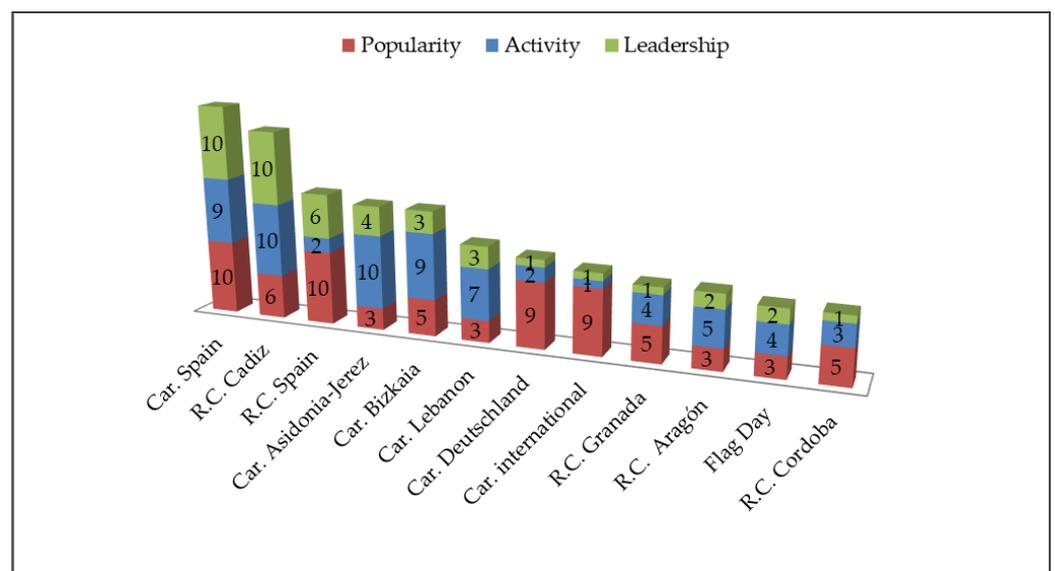


Figure 6. Ranking of pages according to their activity, popularity, and leadership levels.

According to the results shown in Figure 6, the Spanish Red Cross is the most popular page; however, RCC holds the leadership, controlling the communication in the network, and it is also the most active. In the case of CAJ’s Facebook network, it is the most active organization, but it does not receive much support from the rest of the organizations in its

network, nor is it the leader, which is Spanish Caritas. This last NGDO is also the most popular, despite not being the most active. The most interesting organization is Spanish Caritas, followed by RCC and Spanish Red Cross. CAJ is in the fifth position.

To understand better how organizations position themselves concerning each of these three parameters, the three-dimensional graph in Figure 7 was developed using the RStudio program and the Scatterplot3d package to show leadership, activity, and popularity.

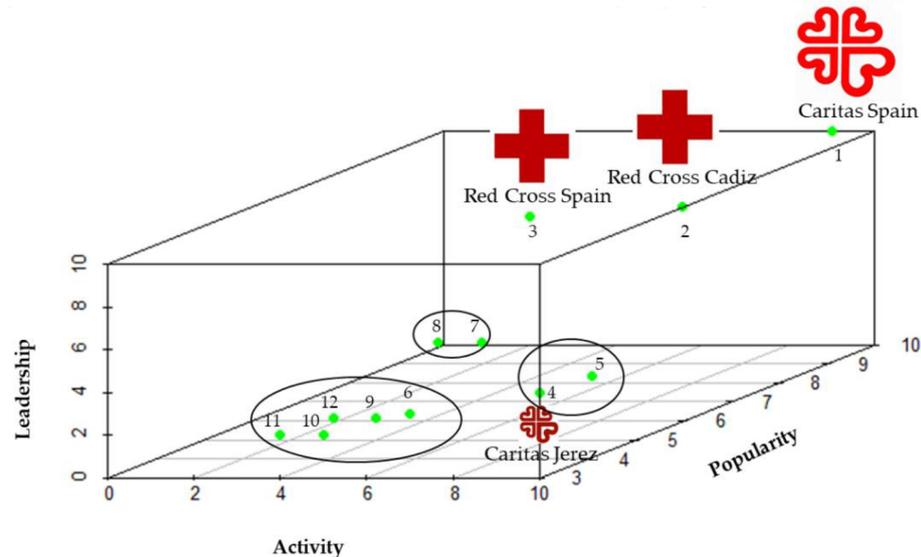


Figure 7. The positions of the organizations according to popularity, activity, and leadership dimensions.

Figure 7 shows that the best-positioned organization in its Facebook network is Spanish Caritas, followed by RCC and the Spanish Red Cross. The second group is formed by Caritas Deutschland (7) and Caritas International (8), which are very popular (score 9 in Figure 6), although they had meager leadership and activity scores. The third is formed by CAJ (4) and Caritas Bizkaia (5), which are characterized by being more active than popular but had an intermediate leadership score. The fourth group is made up of Caritas Lebanon (6), Caritas Granada (9), Caritas Córdoba (12), Caritas Aragón (10), and Flag Day (11), which had average scores for activity and popularity, and low scores for leadership. In summary, four groups can be distinguished: The first group is made up of the organizations with the best ratings on leadership, activity, and popularity; the second group is characterized by high popularity (under leadership and activity); the third group stands out for its activity (under leadership and popularity), and the fourth group stands out for its low leadership scores and average ratings in popularity and activity.

4. Discussion

Social networks have become valuable marketing tools for NGDOs. According to the interviews carried out, although these organizations do not make the most of their potential, there is a willingness to promote social change through communication on social networks. However, these organizations recognize their lack of knowledge in planning and monitoring social marketing strategies, which coincides with the findings of other studies such as those by Brionesa et al. and, Nos and Santolino [90,91]. This lack of knowledge is highlighted by exploring the RCC's and CAJ's Facebook networks and analyzing with whom they choose to connect, what characteristics the stakeholders have, and the communication roles the organizations play in the network. In this sense, the modularity analysis results have identified two factors as community generators. First, there is the organization's nature, in this case, pages belonging to the Red Cross, Caritas, local companies, and the media. The results show that communities are formed by similar organizations or by those that have several aspects in common. In this regard, as Burt mentioned, solid relationships and mutual acquaintances tend to develop between people

with similar social attributes such as education, occupation, income, etc. [54]. The latter two (companies and the media) make up a more isolated group but are no less important because they can generate a great deal of citizen participation due to events or activities within the residents' reach. As Granovetter [52] pointed out, these weaker links may be more relevant than other sites with closer ties or strong links.

The second factor that has influenced the formation of communities is the geographical location. Accordingly, similar patterns form clusters in the RCC and CAJ Facebook pages depending on the environment, whether it be international, national, or regional (Andalusian).

It is also interesting to note that the national branches of the Spanish Red Cross and Spanish Caritas are present in the resulting networks. Many of the campaign or marketing activity guidelines, such as the campaign to end homelessness carried out by CAJ every year in November, are established by these branches. Although empirical evidence supports the idea that geographical proximity can significantly increase the likelihood of the formation of ties [92,93], some studies have claimed that the use of technological platforms by NGOs allows for the creation of inter-organizational ties regardless of geographical location. With this in mind, Liu and Shim [94] showed that geographic proximity did not significantly impact the formation of relationships on Twitter in a study they conducted on international child rights NGOs. Studies such as that by Strauß et al. [95] found that the geographical factor motivates diplomatic organizations to relate to each other.

Another noteworthy fact is that partner companies such as Carrefour and Supersol, which participate in collecting food on behalf of the NGOs, were not identified in the networks. Some studies have found interest groups based on different factors to those commented on above. For example, the study by Frankowska, Łęcka, and Frankowski [96] found that the NGOs that implement Poland's development policy in Africa are highly polarized and can be divided into two groups according to their capacities. The first consists of two large organizations with a long history and the capacity to raise funds internationally, and the second consists of smaller NGOs with different capacities and working strategies.

Regarding the communication roles of the organizations examined in terms of leadership, popularity, and activity, the following aspects should be highlighted. It was found that RCC has half as many fans as CAJ, i.e., it is less active, so it should consider more carefully who its stakeholders are and establish more relationships with them. However, the fact that a page is active does not necessarily mean that it is popular. In other words, if an organization is a fan of many sites, it does not mean that they will reciprocate. Concerning the above, RCC is the most active organization in its Facebook network, but it is not the most popular, which would be achieved by increasing the number of "likes" it receives. One proposal would be to offer valuable content which would increase the interest of other pages through publications with information that is necessary, or at least useful and valuable to visitors. It would increase the organization's visibility, which would help it to have a more significant presence in social media and create communities with a high interaction rate, encouraging dialogue [97]. For example, on the pages of initiatives such as that of Flag Day, one possibility would be to communicate the activities carried out in the local environment, be interested in those carried out in other locations, find out how they are developed, their results, etc. It could be carried out by encouraging communication with similar organizations in other cities and local media. In this sense, as can be seen in Figure 1, there are not many media outlets ("Radio Puerto," "Lanzadera del Estrecho," and "Planeta Futuro/El País"), nor many local companies to which RCC is linked in the network under consideration. Likewise, these last pages do not support the organizations being studied. As for CAJ, no media organizations appear in its network, although they have a relationship with the media.

As noted in the interview with the head of CAJ's social networks, the organizations are referred to in the messages thanking them for their collaboration. This fact coincides with Balas [98], who believes that NGOs are mostly dedicated to managing relations with the media and are more similar to a press office rather than a marketing department. It

is interesting to note that, in most cases, we do not talk about a marketing department but mainly about communication [99]. Another measure to increase popularity would be to strengthen relationships on Facebook with companies that collaborate in initiatives such as collecting food, school supplies, toys, etc., as they do not appear on the network (for example, Carrefour and Supersol). Finally, it should be noted that RCC was not supported by the Malaga Red Cross, which is responsible for the Red Cross's social networks in Andalusia. In this case, relations with organizations belonging to the Red Cross on the provincial, Andalusian, and national levels could be improved, considering that they are collaborators, not competitors.

Regarding leadership, RCC stands out as a leader in its Facebook network, which reveals its ability to occupy an intermediary position in communication. It means that a large number of organizations are connected thanks to this organization. In the case of CAJ's Facebook network, the leading page in its network is Spanish Caritas. Thanks to this page, located in the center of the network, CAJ is connected with other dioceses in Europe, which allow one to learn about initiatives such as the one carried out through Caritas Lebanon, which consists of a project through which a family can sponsor a child from poor, vulnerable, or disadvantaged families in the south of the area.

5. Conclusions, Practical Implications, Limitations and Future Lines of Research

Our contribution to the current marketing knowledge concerns two main issues. On the one hand, we have shown how to identify the factors for generating interest groups in NGDOs on Facebook. On the other hand, we have shown how to set up a procedure to establish the positioning of the organizations in a study based on the roles (activity, popularity, and leadership) they play in communication. In this sense, two factors have been identified through empirical analysis as community generators; the first is the organization's nature, i.e., relations are created above all between the organizations under study and various NGDOs, and between these organizations and the media. The second factor that gives rise to the creation of links is the geographical location; similar patterns are identified in the formation of clusters according to the environment, whether international, national, or Andalusian.

It should be noted that some communities appear as isolated groups that can be considered weak links but are no less important, as relationships can be established that may not be found in their "strong links" or through organizations with which they have closer ties [56]. Regarding the communication roles of the organizations examined, leadership, popularity, and activity, the following aspects should be highlighted: An organization can be very active, that is, it can show interest (through the "like" function) in a considerable number of entities, but this does not mean that this will be reciprocated. In other words, the fact that an organization is active does not mean that it is popular. Concerning leadership, it is necessary to indicate that the most active and popular organizations tend to be leaders in communication. In this way, many organizations are connected thanks to the leading organization and may be interested in their actions and initiatives they carry out. In this sense, four interest groups have been identified: The first group is made up of the organizations with the best ratings in terms of leadership, activity, and popularity; the second group is characterized by high popularity (under leadership and activity); the third stands out for its activity (under leadership and popularity), and the fourth cluster stands out for its low leadership and average ratings in popularity and activity. It should be noted that positioning the organizations in specific groups with specific characteristics of popularity, activity, and leadership allows us to know which roles need to be improved and, consequently, to plan actions or initiatives to improve these roles.

Another conclusion derived from this research is that, according to the interviews conducted, NGDOs do not have sufficient knowledge about social marketing strategies or social networks as marketing instruments. However, there is a willingness to promote social change through communication in social networks. Despite the importance of stakeholder identification [100,101], there is no consolidated culture on this issue, and

NGDOs do not dedicate sufficient resources to identify and strengthen relationships with other organizations that may be of interest to them.

Our approach has an increased practical value in professional social marketer practice, particularly in the NGDO sector. Although the proposed approach has been applied in two cases in the province of Cádiz, it could also be used to analyze other NGDOs, thus expanding the field of action to other areas such as regional or national as in any other areas other sectors. In addition, by integrating SNA with interviews, our approach is a more accurate instrument for segmenting online stakeholders. A better identification can result in better choices for strategies and tactics for cultivating relationships. Thanks to the interviews, a lack of knowledge about instruments and indicators to conduct a marketing analysis on Facebook and set objectives has been detected. It has also been verified in the literature review. Hence, providing a focus on the monitoring the communities on Facebook and offering two instruments such as the two maps presented. These maps can also be carried out for any organization. Finally, our approach can stimulate broader reflections among marketing practitioners on the stakeholder management idea. Given that in the years to come, social media and digital technologies will develop even more, marketing practitioners should rethink and consider how to integrate online and offline stakeholders to create synergies among different groups and even promote a culture of sharing and endorsement with selected stakeholder groups.

Despite its contribution, this study is also subject to several limitations.

First, although the main objective of this paper was to propose an approach for analyzing the stakeholders from various organizations based on their Facebook activity, on a practical level, we applied it in two cases in the province of Cadiz. In this sense, as with much qualitative research due to the small sample size, the analysis results, such as the factors generator of communities, cannot be extrapolated to an entire population. Therefore, a quantitative research methodology could be applied, for example, a regression analysis, to identify key trends, for which larger samples would be adopted to investigate and validate findings. For example, with a larger sample of organizations, information from each one can download such as in-degree, out-degree, the number of fans, the number of messages posted, and the type of organization to which it relates. In this way, a content analysis, association tests, hypothesis testing, or a regression analysis could be performed to check whether the type of organization to which it is linked is related to the number of fans, the number of publications of the entity in question, or other of the mentioned variables. In this regard, it should be noted that, in recent decades, statistical models have been developed to study social networks, which allow, based on measures of network structure (e.g., reciprocity or transitivity), to test hypotheses about the patterns of network formation. One of the most widely used and successful models has been Exponential Random Graph Models (ERGM), which explain the probability of an observed network as a function of endogenous and exogenous variables. The ERGM methods estimate the probability of tie formation among dyadic nodes compared to what would occur randomly by chance alone [102]. This type of analysis can also be developed if the research is approached from the point of view of audience conversations. For example, in Wand and Chu's (2019) research on Twitter [103], focused on conversations about an online campaign, the ERGM results showed a significant geographic homophily effect. People tended to share information with others located in the same region, which is consistent with the results of our study. In addition, another result similar to that of the present research is that the most active Twitter accounts did not obtain more links to share information.

Second, a strategic and concrete sample of interviewees was also selected, not with the intention of their statistical representation but of their relevance for the research. In this sense the interviewees were selected based on the following criteria: Firstly, they should be responsible for communication on social networks, specifically Facebook, in their action areas. Secondly, the aim was to know the opinion of those responsible for managing social networks at different geographical levels of action, i.e., at local, provincial, regional, and national levels.

Third, given that social networks constantly change, and social media stakeholders change too, the current results are limited to the observed period, thereby providing an opportunity for future research to investigate more recent or emerging behavior patterns.

As a future line of research, we propose that it would be worth studying why some organizations' Facebook pages show interest in other organizations' Facebook pages, how they establish relationships, and how these relationships can become fruitful. Two approaches could be taken: one would focus on groups in a particular network, studying the sites' characteristics and messages to detect relationship patterns; the other would be to analyze the communications of several networks of organizations of a particular nature. In this way, appropriate content marketing activities could be designed to see if they improve the roles they play in communication. Along these lines, Wyllie et al. [55] carried out a study in which they jointly analyzed the Facebook networks of three mental health organizations in the United States, the United Kingdom, and Australia. Using the Minimum Spanning Trees (MST) technique, they identified the global central actors' networks and several interest segments. They also compared the resulting network graphs in pairs using the Pairwise network graph comparison technique. Finally, another interesting study could focus on optimizing networks in the online environment according to the size and diversity of the network. As Burt mentioned [104], the optimized network has two design principles. The first one is efficiency, which refers to maximizing the number of non-redundant contacts in the network, since as given two networks of equal size, the one with more non-redundant contacts provides more benefits. The second is effectiveness, which consists of maintaining relations with primary contacts (ports of access to clusters beyond) instead of with all contacts.

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