

New Marketing Research Models: The Potentials of The Social Network Analysis Applied to Social Media.

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This work addresses the issue of the relationship between marketing research and the opportunities provided by Internet. In particular, we focus on the recent developments arising from digital tools such as social media and the ability to access to a continuous stream of data through the use of Big Data Analysis platforms.

Indeed, Big Data technologies have strongly impacted in research performances giving rise to new techniques, enhancing or bringing back other methodologies which had lost appeal over the year. In this regard, the social network analysis technique is considered in this study. It can be adopted for many marketing purposes thanks to the recent developments of social media. The aim of the paper is the identification of an analysis model based on the social network analysis methodology, useful to conduct marketing research within social media.

Metrics described have been selected based on their capabilities to generate insights that can support marketing researcher for a series of evaluations. Therefore it is considered that the present model can contribute to create a new marketing approach, where the use of social media can be seen as a resource and as an opportunity for the relevant managerial and marketing implications identification.

Key words: Marketing Research, Social Network Analysis, Social Media

JEL classification: M31.

1. Introduction

This paper addresses the issue of the relationship between marketing research and the opportunities provided by the Web. Today marketing is operating in a highly volatile and uncertainty context, therefore, one of the most effective approaches is certainly the market –driven one. The market-oriented enterprises should operate with formalized useful tools to satisfy their need for information related to business sector, competitors, customers, products and global context. In this perspective, marketing research can provide the techniques and methodologies required to obtain and process such information. At the same time, the new Internet developments, in particular the diffusion of the Web 2.0 tools such as social media and the spread of the platforms for the Big Data Analysis, are producing a significant impact on all aspects related to management. In this context, the marketing has started introducing, those technologies and platforms that have helped to create new opportunities. Marketing today is able to draw on an unprecedented mole of data.

Data is generated by a continuous process and come from multiple sources. This data stream, if properly read and interpreted, opens new scenarios, new challenges and endless opportunities to marketing research.

Specifically, in this study, we focus on the role of social media not only describing them as digital communication tools, but also as a source of a series of quantitative and qualitative information, which are strategic for the figure of the marketing researcher. One of the most interesting methods that you can use social media as a research tool is that of social network analysis.

Ideed the technologies behind big data have impacted heavily on the performance of research resulting in new techniques, enhancing or bringing back other methodologies which had lost appeal over the years. In fact, technological progress has meant that techniques already established as ethnography, text mining and sentiment analysis can now be applied by researchers on much larger samples, costs and timing relatively lower, and sometimes producing output real time. We can also include social network analysis among these techniques. Through the application of network analysis, it's possible display complex sets of

relationships that are represented graphically by maps (eg graphs or sociogram) and quantify them with precise metrics. Through such representations, the researcher can provide a measure of the size, shape and density of a network, and determine the position of each element therein. The social network analysis can now be applied to the social networks that are generated within the various social platforms

such as Facebook, Twitter, blogs and YouTube. Users of these social media establish connections continuously producing and sharing content and interacting with each other.

It is in this scenario that comes the need to identify new models of analysis useful to shed light on the reality of fragmented research tools online, that now require interdisciplinary skills and knowledge of various technologies.

Objective of this work is the identification of an analysis model based on the methodology of social network analysis that could be useful for conveying marketing research within social media.

2. The impact of the Internet on marketing research

The last few years have been characterized by strong changes and companies have radically changed their traditional logic of marketing and communications. The rapid and constant evolution of the Internet, has sanctioned the creation of new tools that are finding more and more space within the marketing strategies. Internet, increasing the size of markets and business opportunities, is currently the main driver for innovation processes business.

In this scenario, the concept of the Internet as a research tool has taken on different meanings over the years. On one hand, in a more classical view, Internet is seen as the means by which to develop new forms of interaction with the client-browser (Colonel, 2003) in an integrated face to face optical. What is being described is a transposition of the processes, methodologies and techniques from the traditional view to the online context (Furrer and Sudharshan, 2001; Wilson and Laskey, 2003).

The emphasis is on the higher level of interactivity that the Web allows you to reach which then results in the possibility of a personalized relationship researcher - interviewed.

That relationship, according to Colonel, acquires more value when is considered that "the process of input and feedback of information is through a channel of communication open, real-time and at low cost, when compared with traditional communication channels." Is therefore clear that the "traditional" view of the impact of the Internet on marketing research is mainly focused on the relationship with the customer whose main objectives are to achieve a higher level of loyalty (Slywotzy, Shapiro, 1994) and understand its behavior online.

On the other hand, the Web represents the set of social and technological revolutions, that together provide new information to marketers. These informations are often hidden or difficult to obtain and may relate to consumers and their behavior and purchasing decisions. In this view, Internet is seen as an opportunity for businesses to grasp to develop an image, provide info about products and services, relationships with strategic customers, understanding the purchasing practices of consumers and listen to the needs of the latter to purpose of affixing a continuous improvement to the characteristics of the product / service (Kursan and Mihic, 2010).

As stated earlier the Internet is considered to be a relatively inexpensive and easy to conduct a marketing research, but other benefits have been identified. The Web provides the ability to achieve and detect a high number of respondents in a single session. It can be possible also to conduct a survey in "few clicks" and, thanks to the online surveys, get answers quickly. Other studies identify further advantages such as:

- The possibility of targeting a larger population;
- Flexibility and control over the various formats;
- The simplicity of the data input (data entry);
- A high level of participation;
- The use of a variety of media;
- The simplicity of administration.

3. The new perspectives of social network analysis

Technologies and platforms at the base of Big Data have impacted heavily on the performance of marketing research creating new techniques, enhancing or bringing back other methodologies which over

the years had lost appeal. In fact, technological progress has meant that techniques already established as ethnography (Kozinets, 1998) text mining and sentiment analysis (Aaker e Keller 1990; Morrison and Crane, 2007), can now be applied by researchers on much larger samples, costs and timing relatively lower and sometimes producing output in real time . Among these techniques can also include social network analysis (Chen et al., 2012).

This methodology is witnessing a recent resurgence due to new application possibilities in the field of social media. As is well known in fact one of the most disruptive phenomena born in the context of Web 2.0 is represented by social media (Kaplan and Haenlein, 2010). Social media, in which there are also social networks, are precisely digital platforms of social networks in which users interact with the internet, producing and sharing any kind of content.

Try to understand the dynamics of these relationships by identifying its nature and the main actors within it, represents for marketing, another new opportunity to understand more and more thrust the environment in which businesses operate.

It should be stressed, however, that despite the increasing popularity of social platforms, their potential, understood as the ability to study and map the social networks that are created within them, are not fully exploited today (Hansen et al. 2010).

In this context, given the high heterogeneity of social media, we can assume that each network created whole of these platforms has its own particular structure (layout) that influence the manner of relationships and interactions (Smith et al. 2010).

For exemple Twitter, which will be the subject of study, allows the exchange of short messages, making it an ideal tool to point out efficiently on a theme or know the participants and the content of a conference, while the same platform, does not allow in-depth discussion and analysis. On the contrary, the traditional blog, presenting no restrictions for the length of the content and also allowing the integration of multimedia content such as video, audio and photos, are tools used for analysis and descriptions and more detailed discussions. Hansen et al. (2010) in describing the potential of social media identify among the most interesting aspects of the fact that such platform produce a large amount of "social data" that can be used to better understand people, organizations and communities that reside within them.

4. Social network in marketing

In any context in which marketing operates, that is business-to-business, business-to-consumer and consumer-to-consumer, one of the critical elements is undoubtedly the care of relations (Kotler, 1986). Actions such as creating and managing relationships with customers and suppliers, coordination of inter-functional interior to an organization, the study of the positioning of competitors in a given field and understand when and to what extent consumers make use of their personal and professional contacts, are now crucial to marketing strategies (Webster and Morrison, 2004).

In addition, complex elements such as "collaboration, confidence, power and choice" can be described and then represented not focusing on mere relations, but by taking a broader view of the concept of network. It is therefore in a context, characterized by the loss of effectiveness of traditional logic of communication, that marketers are starting to look for new ways of interacting with consumers in, pointing in this case, to "capitalize on the social networks to which they belong" (Van Den Bulte and Wuytts, 2007).

Another important aspect of the relationship between social networks and marketing is related to the concept of brand reputation. In recent years, the reputation management at both brands, both at corporate level, has become a priority of management. From a cognitive psychological perspective, a brand can be conceived, in the memory of an individual, as a node connected to other opinions by more or less strong ties such as a node within a network of associations (Keller, 2002).

More specifically in literature, theories on networks have been applied to many aspects of marketing. These areas include communication based on word-of-mouth (WOM), relationship marketing, the acquisition of information and the dissemination and adoption of new products and services. The table 1 below contains the main references on these issues.

Topic	Authors
Word-of-mouth	Brown and Reingen, 1987; Duhan, Johnson, Wilcox and Harrell, 1997; Goldenberg, Libai and Muller, 2001; Godes and Mayzlin, 2009.
Relational marketing	Achrol 1997; Brodie, Coviello, Brookes and Little, 1997; Iacobucci and Ostrom, 1996; Mattson, 1997; Bhattacharya and Sankar, 2003.
Informations acquisition	Moorman and Matulich, 1993; Rindfleisch and Moorman, 2001.
New products and services adoptions and diffusion	Midgley, Morrison and Roberts, 1992, 2000; Rogers, 1995; Van Den Bulte and Stremersch, 2004.

Table 1. Social network and marketing, main contributors

Source: Self-elaboration

5. An application model of social network analysis

The aim of this paper is to identify and propose a marketing-oriented model of social network analysis. In this paragraph we will proceed with a description of the general features of the software. Later we will discuss methodological aspects and operational analysis model. In this view will present the data produced by the mapping of networks generated within the social media Twitter relative to an official profile of a famous Italian fashion brand.

NodeXL is an application that facilitates the complex technique of social network analysis. Being a plug-in, NodeXL is able to interface completely to the program Excel, to which the framework on which it is to work is identical to a common spreadsheet. The program allows to make a series of integrated transactions including collect, store, analyze, display and publish datasets coming from the network (Smith, 2013).

Operationally, the software is designed as a mix of automated and manual operations that allow you to intervene directly on the network to find insight and metrics most relevant to its analysis.

As previously mentioned the "workflow" of NodeXL consists of the steps precise:

- Data collection;
- Storage of data;
- Analysis;
- Display;
- Publication.

NodeXL began as a project of the non-profit Social Media Research Foundation (www.smrfoundation.org) and is still supported by an international collective of contributors from social disciplines and computer.

The methodology adopted for this work is Internet research. This methodology allows to use data from Website, forums and social media using non-intrusive observation typical of research in the fields of social sciences (Hine, 2011).

The Internet Research or Research Methods Online (ORMS) contain all those methods of data collection via Internet (Reips, 2012). Many of these methods of research online are linked to existing methodologies but which have been re-invented or re-imagine based on the light of the advent of new technologies and conditions associated with the characteristics of the network (Seale et al, 2010). In particular, reference is made to the spread of social media which have provided new and unique opportunity to understand the social dynamics (Cheong and Lee, 2011). Social media are so designed as platforms from which to extract large dataset (Reips and Garaizar, 2011) or fieldworks to conduct experiments entirely under the control of the researchers through the use of dedicated software (Reips and Howe, 2013).

The analysis model consists therefore in the identification and description of the metrics in that in literature are considered relevant for marketing purposes and that can be identified and measured by the application of NodeXL at the network under study.

Below will be presented and described the contents of the analysis model.

Network elements	Metric	Description	Implications in marketing
Global Metrics (Hill et al., 2006; Leskovec and Faloutsos, 2006)	N° of Vertices	Express the total number of the actors within the network	Enterprise Social context overview
	Total Edges	Express the total number of the relationship within the network	
	Network density	Indicates the degree of interconnection between the vertices of the network. It is a value that can go from 0 to 1 and is calculated as the ratio of edges in the network with the maximum possible number of edges	
Vertices (Burt, 1987; Dorfman and Maynor, 2006; Iyengar et al. 2014)	Betweenness Centrality	It is a measure of how often a given vertex is on the shortest path between two vertices	Ability of connection between two nodes or two groups "Bridge"
	Closeness Centrality	Measures the average distance between a given vertex and the rest of the vertices of the network	Distance from the rest of the network
	Eigenvector Centrality	Measuring the quality of relationships according to the type but not the number of vertices to which a given vertex is connected	Degree of influence on the network

Table 2. The application model

Source: self-elaboration

6. Results and discussion

This section presents the results of the mapping that was carried out in this work that relating to the social network's official Twitter profile of the brand that we can not reveal for privacy reasons for which will be called @brandprofile . We then proceeded with the application of the model for analysis and identification of metrics discussed above.

Global metrics	
N° of vertices	144
Total edges	487
Network density	0,0164

Table 3. Global Metrics

Source: Self-elaboration

As can be seen from the table, the amplitude of the network can be quantified by both the number of users (144), both the number of total connections (487). The density is instead equal to 1,64%.

Users	Betweenness Centrality	Closeness Centrality	Eigenvector Centrality
User 1	16632,615	0,006	0,063
User 2	2864,829	0,005	0,044
User 3	566,546	0,004	0,012
User 4	566,000	0,003	0,012
User 5	446,965	0,003	0,012
User 6	408,334	0,003	0,012
User 7	349,937	0,003	0,011
User 8	284,000	0,003	0,010
User 9	284,000	0,003	0,010
User 10	284,000	0,003	0,010

Table 4. Vertices Metric

Source: self-elaboration

From the calculation of the metrics vertex-specific in this case there is a user who plays a central and significant position within the network (betweenness Centrality 1.66), it is of course the official profile of the brand since the network is built according to the tweet in which it is mentioned. Then there are others

that may be considered strategic because it allows the brand to be able to reach others more distant in the network than belonging to other clusters, both because of their degree of influence (Eigenvector Centrality) on the social platform in general. It is interesting to note that the main 10 users are virtually equidistant from the rest of the network, their Closeness Centrality is between 0.006 and 0.003. It should also be pointed out that in this case, given the amount of data to process, it was not possible to identify the subgraph for each vertex.

7. Conclusions, limitations

Through the new model it was possible to obtain a series of useful information to understand the context for marketing online in which the company operates. The metrics proposals have been selected based on their ability to generate insights can support the researcher marketing for a series of evaluations.

The model is in fact able to provide a key to the numerous output that software social network analysis NodeXL produces during the mapping process.

In this view, have been selected metrics that allow to make assessments both general, as quantify the size and density of the network, and more oriented to the actors of the network itself. The latter may provide relevant information about the nature and dynamics of the relationships that develop within the network. They can also allow the identification of those users who have a "strategic" role to the entire network. In this view, it could be possible to check for popular users, influential, or able to act as a "bridge" between other users or other user groups.

This research topic opens up to numerous possibilities of development:

- There is a growing development of technologies, tools and applications for the strategic use of informations collected online.
- These activities are today reserved to highly specialized technicians, but software are becoming more and more user-friendly.
- An interesting theme to focus could be the investigation of the existence of relations between the mapping of networks and the digital marketing strategic planning activities.
- For a further model validation, it would be appropriate to replicate and apply this methodology on different social media platforms.

Among this research limits, there are two of particular relevance: first, mapping the online audience allows only a partial representation of the reality in which the company operates. Second, the informations contained on social platforms, for reasons both of storage, both for privacy, are not always fully available.

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