

## Social and online media research – data, metrics and methods

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**Abstract.** *Studies and current researches in online digital media and communication science are related to Web 2.0 at least from two perspectives: either to better understand this medium as research object, or to collect data on different topics. Social media can be a tremendous data source and topics for researchers. At the same time, these data are found in multimedia formats on different platforms, are updated continuously, and could be posted by professionals or users. This situation requires different solutions for data analysis. The objective of this paper is to show what metrics, measurements, methods and tools are used for by researchers to study and analyze online digital media, in their work with academic purposes. The concern of this paper is to show which research methods are used for social and digital media analysis and which data, metrics and measures are considered as basis of the analysis. Case studies in this paper refer to scientific articles dealing with social media research in online media and communication studies. Findings of this paper show the specificity and trends in media and communication researches related with social and digital media, and relative to economic and social needs. The conclusion that emerges from this paper is that research on and about the Web 2.0 invents or redefines traditional methods and tools, or adopts new ones.*

**Keywords:** social media measurement, social media metrics, social media tools, user-generated content.

**JEL Codes:** A12, C81, D83, L82

### 1. Introduction

The research process is influenced and changed by the large amount of data available on the Web. In digital and social media communication, the content is captured from a wide range of online and social media. The digital content, created by the professionals or by the users, free or paid, shared or earned must be measured and analyzed. Moreover, socialization on Web, done in various forms, has provoked important changes for processes of data collection and also for methods used to analyze various phenomena.

Communicators, theorists and practitioners, should take into consideration new content and new approaches to measure and analyze their activities. The addressed perspective is user-centric or consumer-centric one and it is specific to social media.

Social media, such as blogs, podcasts, social networks, wikis, or mobile applications and games are redefining communication channels, and also communication theories and practices. Content on the Web must refer a lot of platforms and should be measured according to each of them. Social media measurements are a difficult process that must catch conversations, behaviors impacts, modes of communication, and relationships between people.

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To solve this situation, both theorist and practitioners in communication take as a solution for measurement these phenomena an integrated approach based on various data, methods, and tools, also called integrated digital measurements. This paper puts in balance business-focus opinions and solutions offered by practitioners, and also opinion and solutions offered by academics, which are more theoretical.

In July 2010, the Barcelona Summit organized by the International Association for Measurement and Evaluation of Communication (AMEC)<sup>2</sup> adopted seven practical principles regarding measurements for connections, engagement and building relationships with other users (consumers, public, and stakeholders).

Measurement of participation and engagement on social media are a necessity. A substantial measurement of social media must have several metrics sets: channel-specific metrics (such as friends, likes or followers), specific outcomes-metric on a social platform and a business-based metric (Bartholomew, 2012). Although, the social media channel metrics are most used, they are limited because they give no information about connections, engagement and building relationships between people or contents. Moreover, practitioners and also managers do not have the information related to the impact of the business on the social media platforms through channel metrics. These metrics cannot appreciate when the social media platforms are good for their business. These considerations made by Bartholomew (2012) give a different perspective on how to collect measure and analyze data from social media platforms. So, he proposes to be used integrated digital measurements that reflect in addition the activities and effects of social media. Thus, we need measurements, and also methods and tools appropriate for that. This is a practical perspective to this matter.

The academics say that new metrics, more relevant in social aspects, and related to social media activities are necessary. They appreciate that research of social media must be based on user-centred metrics. Digital research must capture characteristics of social networks and also their marketing impact. The keyword in this perspective is user-generated content.

## **2. Data for social and online digital media research**

Data considered in different researches come from different places. These places are web sites, social networks and offline environments (Bartholomew, 2010). Data in online could be aggregated and organized in different types for analysis. Each place used for data collection is based on an objective. For instance, web sites are focused on Web analytics, social networks are focused on content and behavior analysis and offline environment are based on audience research.

Finding information and collecting data are key aspects of research. Thus, social media sites are good environments for this purpose. Moreover, the social media metrics takes into consideration both quantitative and qualitative aspects. The quantitative aspects are related to the number of comments, friends, likes, followers and others, and the qualitative aspects are connected with the 'sentiments' provoked by the users' actions and also with influences of users' actions.

Data from social media can be collected directly from the social networks sites or through questionnaires applied to users on such sites. Both possibilities have advantages and limitations. Generally, data collection directly from social network sites could present matters of privacy, but they can help researchers to observe Web content, users' behavior and their discussions, approaches of communication.

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<sup>2</sup> International Association for the Measurement and Evaluation of Communication (AMEC), <http://www.amecorg.com/>, Institute for PR & AMEC. (July 2010). The Barcelona Declaration of Measurement Principles. The *second European Summit of Measurement*. Retrieved from <http://www.instituteforpr.org/wp-content/uploads/BarcelonaPrinciplesOct2010.pdf>

Data collected from social network sites can give a longitudinal perspective in time for a phenomenon. This situation favors analyzing the dynamics of the phenomena, and also their general and specific aspects. The time aspect for data on these platforms can be captured with visualization tools.

According to social networking sites, metrics more relevant in social aspects and related to social media activities are necessary. These activities could be the users' engagement and collaboration, content aggregation and syndication, content sharing and bookmarking. For instance, data collection is related with aggregation or syndication processes. Aggregated content is collected from different sources from the Web. Thus, metrics such as the number of RSS subscribers or the number of links to content reflect the engagement and collaboration activities on social media sites. Bartholomew (2012) says that data must be collected that appreciate three main aspects: exposure, influence and action and refer to "*number of individuals in the target audience, number of survey respondents, number of respondents 'aware' of the product/company, number of respondents who would consider/seriously consider purchasing the product/doing business with the company, total branded mentions, volume of positive and negative mentions, number of posts, number of comments, number of RTs and @ mentions, number of followers*". Several data can be collected directly from the social media platforms; others must be collected with tools that help to obtain a complete data set. In most common situations analytics tools are used.

### **3. Metrics and measurements of social media communication model**

Bartholomew (2010) considers that we must appreciate the digitization research according to the model of communication provided by social media. This model is based on user-generated content and it is characterized especially by peer-to-peer evaluation and bidirectional relationships. New metrics must be considered in research and also in practical activities, in accordance with these characteristics. Thus, in the social networks, is also important to measure conversations and not just actions. Metrics also must be correlated with different types of business or research objectives.

Characteristics of models of social media communication and the metrics associated with them are influenced; engagement; reach and adequacy (Bartholomew, 2010; Silva, 2010). These characteristics and metrics refer to activities on social media platforms such as: upload photos, watch videos, listen audio, create online profile, read / write blogs, and also to the user behaviour. Some of these characteristics are also found for traditional media. For instance, engagement can be appreciated with traditional metrics like readership, and with digital new metrics like subscriptions, repeat visitors and follower mention. Definitions for these characteristics are given by Bartholomew (2010). He says that engagement is the degree of users' involvement to a subject and it is appreciated by the topics per month, or the number of active participants. Influence refers to actions, attitudes and opinions of the users provoked by the other users. It can be appreciated by the quality of Twitter lists or by the Klout score. Reach refers to spreading of information and content and it is appreciated by the number of total followers or by the number of views of videos. Adequacy refers to content in relationship to keywords and sentiments.

#### **3.1. Several perspectives for social media metrics**

A perspective to social media metrics are given by Bartholomew (2010). He associates the metrics to activities found in the model of communication for social media and also to model of content from the Internet. His proposed metrics can be used both in online marketing and also in research studies. The model of communication in social media proposed by Bartholomew (2010) is based on four types of activities, each of them having traditional and digital metrics, such as: exposure (degree of exposure to content and

message), engagement (degree of interactions with the content), influence (level of influence of the target), and actions (types of actions target taken). In the vision of Bartholomew (2010), metrics are also associated to the model of content found on Internet, named PESO content model (Paid-Earned-Shared-Owned).

Other perspective to social media metrics are given by Silva (2010). The author says that we can measure the users' profile, the content and also the user's activities and connections (links) on social media platforms. Each of them has specific valences. Content has density, valence, proximity, and attribution. Links have direction, initiation and emphasis. Silva (2010) refers to metrics associated to awareness, influence and engagement on social media platforms.

Moreover, according to the Interactive Advertising Bureau<sup>3</sup> (IAB, May 2009), social media must be addressed from three dimensions: reach, relationships, and relevance and for three platforms. IAB proposes 9 metrics for social media sites category, 12 metrics for blogs category and 9 metrics for applications and widgets category.

Many other authors and companies use different metrics for evaluating performance in social media. In general, each of them takes different aspects of social media and metrics associated, such as: metrics for social commitment (affiliation, conversation, utility, advocacy, information, and identity); metrics for brand performance (quality perception, brand trust, recommendation); behaviour-specific and action-focused metrics (engagement, quality and concentration of audience, impact on purchase behaviour, actual viewership); activity and engagement in social media metrics (members, posts/threads, comments or ideas, inbound links, tags, votes, bookmarks, active profiles, referrals, post frequency/density); awareness and value metrics (brand loyalty/affinity, media placements, share of conversation, sentiment of posts, net promoter score, interaction with content, employee social graphs).

Lovett and Owyang (2010) say that many companies use wrong metrics for social media. So, it is necessary to use adequate measures for social media. Their approach and metrics are based on directions such as: dialog, support, innovation and advocacy on social media platforms. Dialog refers to audience engagement, or conversation reach. Advocacy concerns active users, influential users, or impact of advocacy. Support is measured by satisfaction score. Innovation is given by topic trends, sentiment ratio, or idea impact.

Forrester Research approach (Elliot et al., 2011) for social media metrics is given by measurement of social media from the perspective of: engagement, involvement, interaction, intimacy, and influence. The model proposed gives three perspectives for the metrics: digital, brand and financial. For instance, digital perspective refers to metrics grouped on social opportunity category (such as: fans, friends, members, visitors and readers) and on social health category (such as posts, comments, and sentiments).

While metrics refers to number of friends or fans, number of likes, comments or shares, the Facebook Page Insights can help to view the performance of the page, such as the size and the engagement of the audience, types of engagement, how viral is a post or certain content, and total reach. Metrics used for Facebook activities in the Page Insights are grouped in several categories, such as: total interactions and over time interactions, interactions per posts, fans over time, page views, impressions per post, and ads.

### **3.2. Influence in social media and its measurement**

In the sites analysis, it is not recommended to use a single metric and also it is necessary to consider the whole context to determine comparisons. An example for social media sites is Knout Score and the

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<sup>3</sup> IAB (Interactive Advertising Bureau). (May 2009). Social Media Ad Metrics Definitions, Retrieved from <http://www.iab.net/socialmetrics>, <http://www.iab.net/media/file/SocialMediaMetricsDefinitionsFinal.pdf>

“influence” dimension. The ‘influence’ dimension of social media is a very important aspect in research studies and also in practical activities.

Influence or ‘to be influenced’ is defined by Bartolomew (2011b) as ‘*effecting change in another person’s attitudes, opinions, beliefs and/or behavior*’. It is different face to influence in social networks. He considers that influence is dependent by the *change* and also it is contextual. In all situations, influence manifested to someone is to take an action such as visit a site, vote, comment, etc. These actions must be measured. The influence process has two stages (Bartolomew (2011b)). First is the opinion, attitude change and second, is the action. So to measure influence is to measure opinion, attitude change and actions did as a consequence of them. It is also a difference between an act of engagement and to be influenced. The possibility to be influenced is greater if you are engaged in a social network. To be influenced is also compulsory to lead to an attitude, opinion change.

In communication studies and practices, the Klout tool<sup>4</sup> is used for influence measurement, and also for popularity measurement. The Knout Score measure influence based on possibility to provoke actions and uses data from social networks. The Score is organized in three values: users’ true reach and refers to how many people you influence; user amplification that refers to how much you influence them; and user network impact refers to the influence of your network. For instance, the Knout Score for Twitter platform measures how users accept messages and how they act and share these messages. Zavarello (2010) considers that Knout Score brings a standard to the “quality” factor of social media analytics in contrast to the “quantity” factor of followers for Twitter. But this metric must be considered with others for a complete perspective. The Knout Score for Twitter considers a lot of data, such as follower totals, accounts follow you back total, number of re-tweets or mentions, number of tweets and their frequency, etc. The amplification value for Twitter shows if the content posted on Twitter platform are re-tweeted and spread. The user network value for Twitter is the ratio of the followers and number of accounts you follow, the ratio between how many of those you follow also follow you back, as well as unique senders and re-tweeters (Zavarello, 2010).

### 3.3. Engagement measurement and metrics

But for social media research studies, these measures are not enough, because these sites are oriented more on measuring the events, activities and on social dimensions such as influence, sentiment, and engagement.

A definition of social media engagement given by Gattiker (2011) says that: “*Social media engagement represents the action of engaging with others using computer-mediated communication tools. Engagement means establishing and sustaining relationships, while developing a level of trust that makes people comfortable enough to do business with you.*”

The engagement through social media is a continuous activity based on different types of conversations, such as replies to posts or different types of support actions, such as likes. Papworth (2011) considers that there are seven levels of engagement in social media. These levels start from monitoring various persons and subjects and end to peer-to-peer economy, as follows: (1) – “*Internal and enterprise approach to social media*”, (2) – “*Social media monitoring and eavesdropping*”, (3) – “*Social media as a broadcast - Out medium*”, (4) – “*Social media for viral distribution*”, (5) – “*Social media campaigns*”, (6) – “*Collaborative social media*”, and (7) – “*People powered social media*”. Thus, Bartholomew (2010) considers that “*measuring engagement became more important than measuring eyeballs. The frontier in social media measurement is evolving toward measuring both the conversations and behavior patterns occurring within*

<sup>4</sup> Klout Score, <http://klout.com/corp/kscore>

*social networks, and understanding and connecting the underlying influences and motivations for the online behavior”.*

Leander (2011) says that “engagement is measured in interactions”. On Facebook that translates into likes and/or comments. He tries to answer to the question “*What is a good engagement rate on Facebook*”. His answer is aligned to the values given by the socialbakers.com site. The engagement rate is a metrics calculated as a percentage of community members who either liked or commented on wall posts. The benchmarks of engagement rate on Facebook proposed by the author and also by the socialbakers.com site are situated in the below intervals: above 1% - engagement rate is good; between 0,5%-0,99% - the engagement rate is average; and below 0,5% - the engagement rate is very poor.

The general view for a Facebook page addresses number of fans, content on the page, the engagement activities (likes and comments) and quality of conversations. The socialbakers<sup>5</sup> site (2012) refers to metrics for Facebook research, such as: average engagement rate on Facebook and Twitter, total interactions, number of Facebook likes, and Facebook comments. Engagement rate is calculated for one post or for a page as the number of interactions to a post (likes, comments and shares) and divided by the number of fans or divided by the pages posts.

Shanahan (2011) considers that engagement rate (ER), the ways in which audiences consume the editorial content in digital environment, and also audience size. These two factors are important for media activity evaluation. He shows that “the engagement rate for an individual piece of editorial is rarely above 10%. Average engagement rates across all editorials within a site are usually below 10%”.

According to Wong (2011) Facebook pages for media could be monitored and measured with their performances over time. She compares some different strategies between performance for Facebook pages of brands and media, and concludes that what works for brands is different from what works for media. Although, the engagement rate is considered as the most important metric for a Facebook page, for media, it is different. Wong (2011) says that the number of likes posted on each page's wall and number of fans are very important indicators for media. She notices that in media, the number of fans has a higher value than in other industries. In this context, the average engagement rate is lower because the number of comments created by the fans is lower. Fans are reserved to comment difficult topics on Facebook pages for media. In this case, best metrics for measuring success are still the number of posts per day or number of fans.

## **4. Research methods in social media**

Research methods are useful for different disciplines, and they can be also applied alone or in a combination. In the social media research, used methods concern both communicational aspects and also the users' social behavior.

### **4.1. Network analysis**

Rosen, et al. (2011) indicates that the data found on the Internet, methods and theories used in computer-mediated communication, and also online environments influence the research at this time. Herkman (2008) shows that in media and communication research, quantitative methods are more important in empirical analysis. The quantitative methods such as surveys and content analysis are often found in the research papers. Moreover, for researching phenomena of social media, specific methods are also used, such as networks analysis.

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<sup>5</sup> SocialBakers. (2012, 2 February) How to Measure & Engage Your Audience with Socialbakers Analytics PRO/. Socialbakers.com. Retrieved from <http://www.socialbakers.com/how-to/404-how-to-measure-engage-your-audience-with-socialbakers-analytics-pro/>

Social network analysis is often used to analyze the structure of online relationships on social media sites. For instance, Rosen, et al. (2011, p:32) analyze political blogosphere and its hyperlinks using this method. In fact, the space of blogosphere is predestinated to be investigated with this method. The structure of hyperlinks could determine next the influence and authority in the network. Both influence and authority are very important aspects for media and communication research. For instance, a study regarding the influence in political blogosphere is done by Meraz (2009). He explains the relationship between influencers in blogosphere and agenda settings within a specified social network.

Studies for social media sites such as Facebook and Twitter are also addressed through the network analysis method. Structural analysis of hyperlinks and also its visual representation are used on these sites. Media consumption and users' behavior in social networks is a topic studied with social network analysis method. Network analysis permits also to study specific phenomena, such as information dissipation. The idea of information dissipation through social networks sites are frequently found in the research papers. Twitter as a medium for news sharing and diffusion is studied by Cha et al. (2011). They analyze the spread of media content, especially of videos, through blogs. Cha et al. (2011) noticed that the multimedia content is more shared among bloggers. They obtained a diffusion model of videos depending on topics and show that content such as news information, political commentaries and opinions are spread in hours or days, meantime music and entertainment content are spread over months. The information diffusion is also a preoccupation widely seen in sociology and marketing studies. On the other hand, hyperlinks network analysis is very important to study Web subspaces such as blogosphere, news Web or photo Web.

A method related to network analysis is mining techniques. It is used to analyze the blogosphere and has origins in different areas such as web mining, social networks analysis, network theory, graphs theory, and games theory. This method permits to analyse different degree of activity of bloggers, and degree of connection between bloggers. Also, blog mining techniques are used by blogs search engines. They can allow identifying trends within large volumes of data, and identifying the key attributes of these data. Blog mining is considered a qualitative research technique used for a big number of posts.

#### **4.2. Web content analysis**

In communication studies, the content analysis was traditionally the most appropriate method to research. It still remains an important method, but taking into consideration the specificity of digital content. In content analysis, two main aspects must be considered: first, are data analyzed and second, is the coding scheme. Content analysis on Web is based on online data. Web based automated content analysis used in generally traditional metrics such as article counts, impressions, message uptake and sentiment (Bartholomew, 2010). Content analysis is most appropriate for automatic process of analysis, but sentiment analysis in social media is driven better by the humans.

Regarding the method implementation, Neuendorf, & Skalski (2010) say that in scientific papers there are two main content analysis methodological approaches: human coding and computer coding (Computer-Aided Text Analysis - CATA). Authors mention the vital contribution of human coding techniques for CATA approach in terms of: (a) Creation of content analytic schemes that could be transformed then in a CATA algorithm; (b) Measurement of constructs and the not yet adequate devised CATA indicators; (c) Ongoing validation of CATA measures (idioms, etc.) evolve over time.

In the quantitative content analysis are not rigorous parameters. Neuendorf, & Skalski (2010) describe the content analysis in terms of description, prediction, explain and control the human-communication. Content analysis is based on various software, either commercial or free online. All of them uses algorithms

for keywords searching and counting and involve more dictionaries. CATA programs work with pre-set dictionaries but also with custom dictionaries, created by the users. The authors also consider that content analysis for texts is effective in science only whether it is considered an interdisciplinary approach and also a complex method that involved sometimes sentiment analysis, text mining and similar word-pattern discovery. Measurement the text using CATA techniques involve also measurement or description of frequency of words, average word length, concordances, keyword-in-context

Neuendorf, & Skalski (2010) show that online communication is very generous topic for content analysis due to its interactions. Researches on computer-mediated communication (CMC) reveal that are differences between online text and naturally written text (Abbasi and Chen, 2008).

However, in the conditions of digitization of research, the Web content analysis is more than an automated process for coding scheme. The Web content analysis is more complex and it is completed with other methods, data and interactions, such as social networks analysis, audience research, and web sites analysis (Bartholomew, 2010).

Web content analysis (WebCA) is used in communication studies, and it based on a description of the Web content and also of Web links. The content analysis research method is adapted to the specificity of the Web and to social media sites. This method was studied in detail by Herring et al. (2006, 2009). The Web content is not only about text, images as in traditional media; it is also about hyperlinks and interactive discussions generated by a text or an image. Moreover, time is another dimension in the Web content analysis that must be considered. Herring (2009) presents the method of Web content analysis (WebCA) and considers that new influences in research methods are coming from computational techniques. She says that coding scheme in WebCA is more complex, and also its implementation. Thus, in certain situations, variables and coding schema can not be identified in advanced as in the traditional method. The specificity of sites can require new coding categories. Moreover, the time dependence of variables on Web can diminish the sample. Thus, in many cases, it is not possible to establish a strict coding scheme in advance (Herring, 2009).

Many studies for Web content are based more on hyperlinks. The link analysis is different from traditional method of content analysis. The solution proposed, in general, is to integrate different methods for content analysis depending on the type of site and also on the research objective. Thus, it is necessary to redefine the traditional notions of content analysis, such as comparable units of analysis, fixed coding schemes, and random sampling. However, a minimum and fixed coding scheme for web content analysis can be defined, because we have categories of sites with specific characteristics and design. These categories of site can help to choose comparable units of analysis. The content analysis is frequently followed by a statistic analysis. Also, the research objective can help to choose comparable units of analysis. For instance, we can have studies that use units of analysis time-based, user-based, site type-based or event-based (Herring, 2009).

Web content analysis method is used in communication studies as approach to see different relationships between social media and mainstream media. Herring (2009) uses Web content analysis (WebCA) to analyze blogs as communication platform. It is proposed an expanded Web content analysis that considers both discourse analysis and social network analysis. She considers that research methods must address the characteristics of the new technological phenomena, and the very diverse types of sites.

Web content analysis can be oriented to specific platforms such as Facebook, Thus, Facebook content analysis method is applied by the several analytics tools and refers to post categories, types of posts (such as short and long posts, questions, links, photos or videos), or also to effectiveness of posts (ways the fans are engaged with content, topics that lead to most interactions and engagement).

## 5. Conclusions

This paper offers the perspective both of practitioners and also theorist position facing with digital and social media research. The emphasis of this paper is on data collection on social media platforms, their measures and metrics, and also methods and tools used for analysis. This study brings up some tendencies and a view regarding digital and social media research. The study gives a synthesis of important metrics, methods and tools applied in digital research, especially for media and communication studies. Several general conclusions arise for this study. The digital research on Web is increasingly important and especially social media is a topic of concern in current studies. Traditional issues of research are now adapted to Web subspaces, such as: finding online data, measuring these data and their analysis.

In media and communication studies, the traditional matters are treated from a digital and social media perspective. Professional matters, sources of information, audiences are addressed with Web dimensions.

Web and social media are interesting both for data collection and also as research object. For instance, blogosphere, Facebook or Twitter, as Web subspaces, are usually analyzed from social interaction perspectives or professional perspective. The new types of interactions, such as influence, engagement, participation are analyzed for their effects in media. Online communities around the news sites are studied with other tools and methods, specific for the Web. Thus, the audience studies must consider the potential of the Web.

The interactions on Web and especially on social media platforms are found in the form of hyperlinks. The configuration of hyperlinks is a determining aspect to digital and social media analysis.

As space to collect data, social media platforms are important databases for qualitative and quantitative research. Comments and posts published by the users on social media platforms and also demographic data obtained from the users' profile are used in digital research.

Research methods combine the traditional approaches with the digital ones. The research market of social media in media and communication field is considered to be important, both in terms of volume of topics and in terms of research methods used. New methods, such as Web content analysis or social network analysis are implemented for media and communication research in various ways.

Web and social media platforms are also tools for doing researching, for instance, to deliver different questionnaires or research results. Online and commercial tools are used to track, monitor or measure the social media dimensions for different studies.

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