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Algorithm and Data News as the future of imagetic transmedia journalism

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Abstract
Currently, studies in communication and especially journalism are necessary, even a challenge. This is justified by the dynamism of contemporary media ecosystem, which corresponds to the media, emerging technologies and societies, increasingly participant in communication processes. In fact, these transformations have changed not only the processes but also the compositions of the professional groups, which work in the construction of contemporary news, now multi-language and designed to devices previously adopted, such as mobile phones and tablets. Like the data journalism, which considers the phenomenon of big data and information available in the cloud, despite to not stand out so important when disguised between contents. The crescent participation of professionals in the sciences and engineering is explained to work with these files and binary scenarios, leading to think about selection, cleaning, understanding and build public space from digital concepts of multiplatform. In this study, it was adopted some methodological procedures which include bibliographies research, as fundamental research to understand the process of evolution and practice of journalism comprising the fundamental data to develop the proposal initially raised. With the conclusion of this study, we can understand the Transmedia Journalism as perfect language to develop content based in Big Data, Algorithms for a current data journalism. This is the proposal offered in the paper.

Keywords
Transmedia Journalism, Data Journalism, Media Ecology, Photography.

Contents

1. Introduction

Currently, studies in communication and especially journalism have become, more than necessary, a challenge. This is justified by the dynamism of contemporary media ecosystem - which corresponds to the media, emerging technologies and the societies increasingly participant in communication processes. In fact, the transformations pertinent to this process have changed not only the processes but also the composition of the professional groups working on the construction of contemporary news, which now is performed in a multi-language way and designed to devices such as mobile phones and tablets. One example of this is the data journalism, which considers the phenomenon of big data and information available in the cloud, despite not standing out as important as it is when disguised among the contents it is a part of. Also, the crescent participation of professionals from the fields of sciences and engineering might be explained considering the work with digital files and binary scenarios, leading to the thinking about selection, cleaning, understanding and building a public space from digital concepts of multiplatform.

So, this paper has been developed in order to help to creating a social environment for the development of the data journalism having a conceptual basis concerning transmedia storytelling, discussing about multiplatform content to understand the possibilities of use the collective knowledge available in the cloud. The current paper is based on one questioning and two complementary bases, considering the positive answers at the end of the investigation:

> 1) The first questioning: “Is it possible to develop an area based on concepts of transmedia storytelling and social media suitable for the practice of data journalism supported by concepts CAR - Computer Assisted Reporting?” If the proposal is affirmatively responded (Yes), it could be possible and appropriate to propose a space that contemplates concepts of transmedia storytelling and social media (Arcila, López & Peña, 2017) for the development of data journalism.
>
> 2) According to the answer from the previous questioning, two other emerge: i) “How should the adaptation of methods of data journalism and CAR architecture for a space with social environment be?” and ii) “What should be the algorithmic structure of a space that contemplates methods detected from answering the previous questioning?”

Therefore, in this study, we have adopted some methodological procedures which include bibliographies research, as fundamental research method to understand the process of evolution and practice concerning the journalism and comprising the fundamental data to develop the proposal initially raised. Studies were developed about journalism itself, along with the concepts and parameters on data journalism and new media ecology, which had started from there. Also, we consider that writing appropriately the project of implementation algorithms, although the effective space of programming is not the main purpose of this text.

Concluding this study, we might better understand Transmedia Journalism as perfect language to develop content based in Big Data and Algorithms for current data journalism, which is the proposal of this paper.

2. Method

The article presents results of a multiple case study, initially developed from a bibliographical research. The multiple case study is an appropriate methodology for studying journalism as an object, which justifies the format of the study.

3. Collaborative processes

Before opening the debate on data journalism, it is essential to re-establish the theme previously discussed on transmedia narrative and connectivism, now with concerns about shared content. Although transmedia narrative and connectivism are distinct in origin, both offer very similar concepts in the processes and results. In addition, the two are strengthened with the emergence of Web 2.0, where the exchange of information in P2P processes (person to person) has taken up important space in the habits of citizens.

Transmedia narrative emerged in 1975 from an experiment developed by Stuart Saunders Smith on the name *Trans-media music* (Renó & Flores, 2012), combined with the idea of Kinder (1991) on transmedia intertextuality, taking into account Bakhtin's concepts for dialogism (1997). Finally, the concept was strengthened by Jenkins (2009), who popularized the idea of *transmedia storytelling* (also known as transmedia narrative).

According to the concepts developed by the three theorists, transmedia narrative is a process of language that has as fundamental characteristic the construction of distinct messages in a multiplatform environment, with interactive resources distributed by social networks and preferably offered for mobile environments (Dader, 2014). These processes are also interactive in the feedback of content by contemporary users, defined by Levinson (2012) as "*new new citizens*", whose practice of media consumption is summed with its production. However, it is important to consider that for some theorists the subject of transmedia narrative is confused with crossmedia, notwithstanding that this utmost is about the multiplatform distribution of the same message.

On the other hand, connectivism is the contemporary process of collectively building knowledge. This proposal, presented by George Siemens, in which citizens share knowledge from P2P processes, between members of their networks or by wiki environments (such as Wikipedia), in order to reformulate existing information on the web. For Siemens, knowledge is available in the "digital cloud" and currently one of these clouds is the social network in its various modalities and variations.

Transmedia narrative and connectivism are actually two brackets of the same world, essentially collaborative, made up of the "new new media" (Levinson, 2012), where citizens are directly involved actors in media and narrative processes. They are the rebuilders and distributors of messages and information that are offered on the net. Among these are the information that concern to journalists dedicated to accurate research from data, each day working more with the means and technological support.

Within this fact, we consider that the transmedia journalism consists of a good narrative structure figured up with connectivist processes, which means, the construction of the news provided by social media becomes constant. With each comment that is inserted you get new news. Each reader who adds a new consideration to the content published by the journalist can be considered a co-author of the

public opinion building process, although he may be the author of the news making process (Renó, 2011). In the same way, with each sending of the content through the network of friends the news gains new strength, that is, it becomes another. Moreover, with these new words we get a new journalism, where people are participatory at the highest narrative level.

4. Data Journalism

Journalism is, by itself, an activity that is based on the process of research and interpretation of data for the construction of a narrative that represents these interpreted data. There is no journalism without investigation, nor no data. But it is not redundant to say data journalism, because among all the journalistic methods and their respective genres, there is one that receives this name by dedicating itself to the study of the data from very peculiar procedures that gather in a single space, with a technique, statistical activities from the exact sciences, with the traditional procedures and incorporations of journalism, in addition to adopting more and more technological structures, as Meyer (Dader, 1997, p. 20).

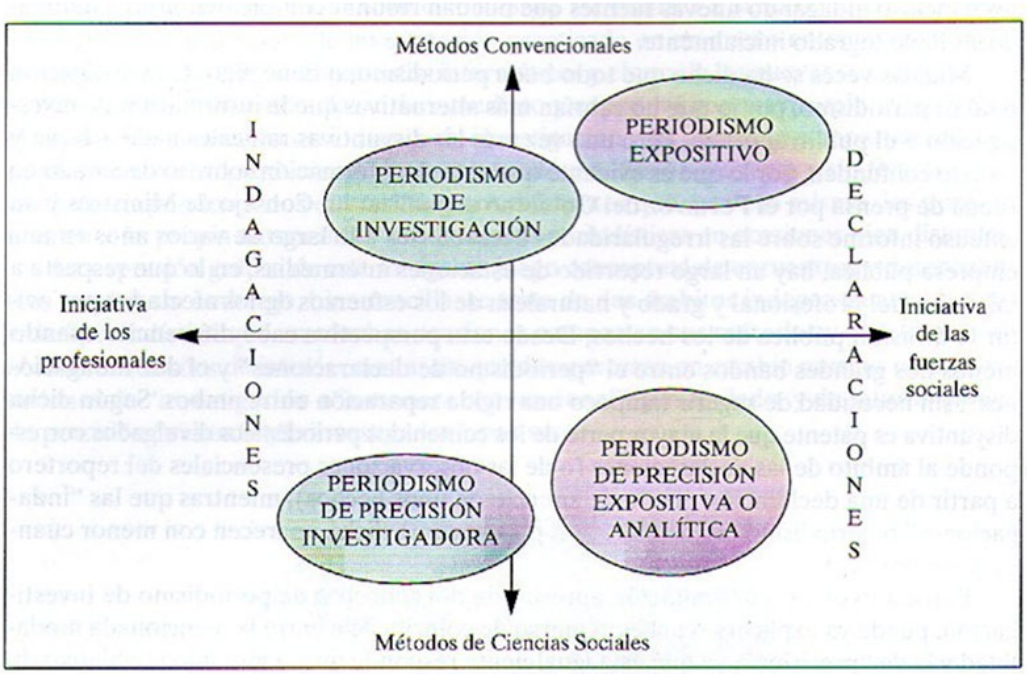
> Meyer defines it as "the application of scientific methods of social and behavioral research to the practice of journalism" (1989, p.196) and already in 1973 indicated that such methods were basically the survey or opinion research, sociological experiment and the content analysis. To them it was necessary to add, as described in previous pages, the search strategies of documents and the general computer monitoring of all types of database, textual or alphanumeric lists.

Dader argues that data journalism is the evolution of investigative journalism. According to the author, data journalism (or precision journalism) is often considered exactly as investigative journalism, which, for Dader, is a mistake, as precision journalism is the evolution of investigative journalism. In addition, even more.

> (...) every time I began, and still do, a presentation on "precision journalism" at a new auditorium, both the participants with their questions, as the very promoters of the event in the presentation, do not cease to refer to all the above as matters of "investigative journalism". In the first few occasions resulted in somehow disheartening situation for me, that after taking perhaps on precision journalism and its potential, many accosted me following referring to all the allegedly described by me as a matter of "investigative journalism". (Dader, 1997, p.25)

This Dader's justification is supported the idea that all journalism is research, although some devote their time to more detailed procedures of the study, in addition to adopting different techniques and tools. What happens is that in addition to these specific tools and procedures, precision journalism has many more, which intend to assure or at least reduce the possibility of no errors caused by the natural features of human psychology that Dader (1997, p.25) calls "cognitive schemes and frameworks".

Figure 1 – Journalism Methods



Source: Dader, 1997, p.28

Key:
Iniciativa de los profesionales = Initiative of the professional
Indagaciones = Inquieries
Métodos Convencionales = Conventional Methods
Iniciativa de las fuerzas sociales = Initiative of social forces
Métodos de Ciencias Sociales = Social Sciences Methods
Periodismo de Investigación = Investigative Journalism
Periodismo Expositivo = Expository Journalism
Periodismo de Precisión Investigadora = Journalism of Investigative Precision
Periodismo de Precisión Expositiva o Analítica = Expository or Analytical Precision Journalism

In the previous graphic, Dader presents a view we realize that data journalism offers analytical results and not just a journalist inspiration, personal impressions, although supported by technical and professional procedures.

Data journalism is also practiced from the adoption of various procedures and methods. One of them is currently the most effective and preferred by data journalists, is that we call CAR - Computer

Assisted Reporting, whose technique is based on crosschecking data and statistics from commands developed in Excel software, but also in conjunction with other programs Developed specifically for this activity.

> The diffusion of CAR is intense in the United States, where only one entity - the National Institute for Computer-Assisted Reporting (NICAR) - prepared up to the beginning of 1999, 12,000 reporters in computerized research techniques. (...) Using the CAR, for example, reporters have proven (and illustrated with tables and graphs) that a third of the State of New Jersey's population live in areas where contamination exceeds by 20 times the recommended limit. (Lage, 2003, p.162)

What happens is that, even if the data is processed in digital environments, it continues its collection following the traditional way, which means, without adopting one of the data gathering possibilities in digital environments. For this reason, it is important to define environments where there are algorithms dedicated to support these labor procedures.

> Any observer can say without effort that the introduction of computers has greatly changed the practice of journalism. Someone who studies the subject well, however, could conclude that this change is deeper than it looks at first sight and that the change process is far from over; in fact, it promises to become permanent. (Lage, 2003, p.153)

Meanwhile, it is clear and sure that no matter how much digital space is built to support data journalism, more of these technological gadgets will occupy the space that currently is exclusively occupied by the journalist. The processes and digital environments serve to approve, complement the journalistic work, and not to carry out its work in an autonomous way, because the machine does not have something that the journalist should always have: sensitivity.

5. Social media and the news: new scenario

When we think of social media and news, the first thing that comes to mind is the flow of information. In fact, social media is an effective tool to provide the flow of information. However, it is not limited to this, especially when *Big Data* is taken into consideration.

We can consider that *Big Data* is a strategy of searching data on the Web from algorithms appropriate for the crossing of dirty and clean data. The work of crossing the data follows a parameter that contains, in addition to programming codes and the definition of tasks and sequences, the definition of key words or terms that are searched. This occurs, for example, to start a search on Google because we define the words and the program responds to the results of the defined themes. The difference is that Google usually offers clean and available data, official or not, while *Big Data* proposes to go beyond the clean data.

In this sense, Manovich (2013) presents the idea that today software follows the command, that is, we need the software to understand and develop tasks on the Web, not only to discover information, but also to perform personal or professional procedures in the a cloud. The author proposes that:

> Converting everything to data and using algorithms to analyze them, changes what it means to know something. It creates new strategies that, together, create a software

> epistemology. Epistemology is a branch of philosophy that questions itself about what is knowledge, how it is acquired, and to what extent a subject can be known. Digital code, data visualization, GIS, information search, auto-learning techniques, steadily increasing processor speeds and lower costs, Big Data analytics technologies, social media, and more parts of the modern techno-social universe introduce new ways of acquiring knowledge and in the process, redefine what is knowledge (Manovich, 2013, pp. 337–338).

Manovich proposes the development of algorithms to obtain concrete results from Big Data. The work of searching the cloud is possible through the algorithms developed specifically for the task:

> For example, it is always possible to invent new algorithms (or new ways of scaling existing algorithms to analyze Big Data faster) that can analyze today's existing data in ways that previous algorithms could not. As a result, we can extract additional patterns and generate new information from old data already analyzed. (Manovich, 2013, p.338)

The author also discusses the relationship between users and social media. To Manovich, the usage of those spaces is almost free and the users publish whatever they decide to publish. This is a space where information can come naturally. According to the author:

> Developments of the 1990s spread to millions of bloggers, uploading photos and videos to social media sites, and freely substituting (or almost) producing and editing software tools that a few years ago cost thousands of dollars. (Manovich, 2013, p.1)

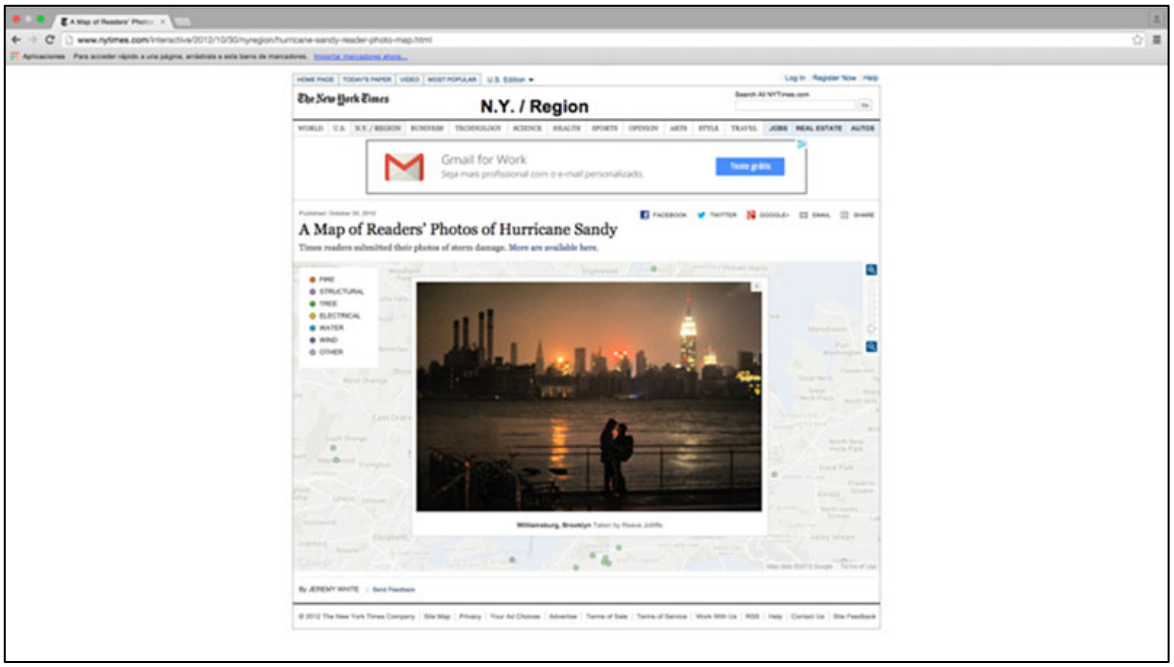
In fact, social media is responsible for the discovery of various information by contemporary journalists. Acting as a journalist without considering the different social media is like working without a typewriter in the 1940s. The news flow in social media, and citizens have interests in circulating, as advocated Gillmor (2005), for whom the contemporary citizens are "half beings".

Adopting strategies of building the news from the collection of information from the media is common in international journalism, especially in extreme situations. In 2012, American journalists covered the trajectory (and destruction) Hurricane Isaac from information circulating in social media, especially Twitter and YouTube.

From this, journalists have come to define this collection of information as hybrid journalism, a mixture of activities and procedures in the search for information, as proposed by journalist Gina Masullo Chen in a text published in Nieman Lab. According to Chen (2012), "The mix of media offered me - who had just moved from a hurricane country three weeks before the storm - a multimedia experience, as I would say, incomparable with the old days of printed media, television and radio".

This was due to a large amount of information in the social media, many of them with audiovisual documentation, which made it possible to compare different news stories about the subject and the safe publication by traditional media. However, it was a possible overcoming for some journalists, especially those who were accustomed to this new media and social reality, where the news circulates between people and journalists assume the role of discovering and understanding it.

Figure 2 – Manhattan in the background partially without power



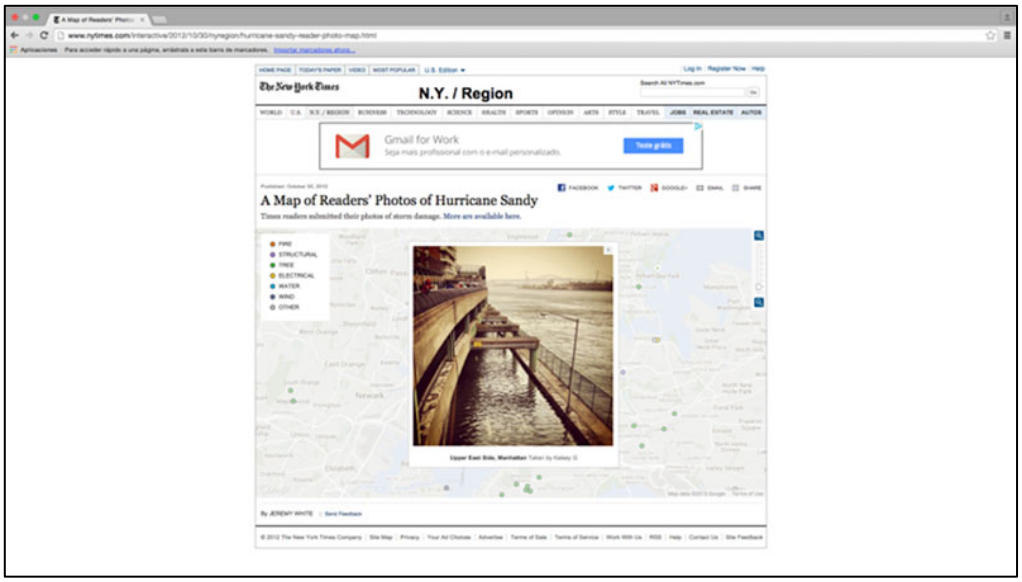
Source: Reeve Jolliffe

In another time in 2012, also in the United States, *The New York Times* created a separate webpage to cover the destruction caused by another hurricane - Sandy - that left New York and New Jersey without accessibility, in a blackout and without conventional communication. To overcome the lack of news due to problems including accessibility, the newspaper built an interactive map with content published by citizens from their mobile devices and *Foursquare* technology to find out if location and registration were really where and when users said. In this way, a map of Manhattan and region was produced with key points and images offered by citizens. It was another step forward for building news from social media and citizen participation.

The page called *A Map of Readers' Photos of Hurricane Sandy*, was published as part of other complementary information, such as interactive maps on the region's climatic condition, the path of Hurricane Sandy by the United States, etc. However, the publication with the best audience was the one of photos, which offered a visual register on the part of the citizens, the extent of the content's circulation went a viral way.

However, these changes were made possible by a mixed editorial staffed by journalism and information technology professionals. Only then the ideas have emerged and took shape, becoming real and possible. This is a proof that it is important to share spaces, especially today when the media ecology gains a new format and becomes a complete and comprehensive different world.

Figure 3 – Water on the street in Manhattan



Source: Kelsey G.

6. Interactive Mapping Approaches

One of the differentials concerning data journalism is its visualization. Therefore, we present here a study originally developed in 2013 by the author and that offers several updates on the information. It is a reinterpretation needed to understand and imagine the interactive maps for journalistic work data.

Interactive maps are historically used to represent territories in a simplified way, that is, they are easier to understand, but with an informative function from hypermedia and / or hypertextual paths, depending on the creative capacity of the author. There may be a lot of information on interactive maps, such as geographic, physical, political, social, or information-based data, because you can share photos, videos and audio in these interactive icons. The information is built from the cross-data and is usually taken in conjunction with other communication platforms so that the information becomes comprehensive. Therefore, it is necessary to obtain the data to then treat them and build the platforms.

According to the video presented by the Spanish researcher Carlos Martínez de la Serna during the course on interactive maps with visual elements (by *Knight Center Foudation*, in 2012), iconography and the use of appropriate typography and color differentiation should facilitate the identification and data hierarchy. It is essential to guarantee the reader a clear and precise map.

To strengthen the debate, Edward Tufte (1990) said, ironically to Paul Klee, that the relationship of color with information is as basic and simple as the technique of color in art, which means, painting is simply the coloring of color in right place. What's more, for a good color at the right point is a complex issue, but one that values information. In fact, this placement of color is as difficult and subtle as avoiding a communicational catastrophe, as it may obscure or highlight important information. However, it is important to clarify that the main function of mapping in journalist communication is to inform about something through a map so that the reader can find a subject, that is, to identify an event, especially when it is about unknown places and located far from the big ones cities.

There is an inherent need in maps to transfer information effectively so the reader can interpret the

data correctly. The large amount of geographic information in digital format gives the reader a better depth of data regarding the place presented, or the subject. The interactive map is also often used as geographic reference support for building news, allowing the user to navigate information. However, these resources are still little explored by the media.

The interactivity in interactive maps is also related to the navigability within them, interacting with the information reported. Making a click on these information points, gives access to information prominently. Another way of interacting with maps is the possibility of inserting data, which can be offered to users with or without filters and mediations. In this way, the user becomes a co-author of the presented information. Contemporary interactive maps offer a way to participate in reading the news, bringing the process closer to a recreational moment that plays a social and informative role with a more effective yet discreet absorption process. Otherwise, we cannot put them in the contemporary media ecology, or consider them as part of a transmedia narrative.

Currently, some of the contents provide navigation from a geographic view. The importance of interactive maps cannot be ignored by journalism, especially when its language is based on gamification, which expressively explores interactivity and its visualization of content. This language allows the usage of analytical maps by the public, since these platforms provide data to assist in interpretation of them and the construction of public opinion, what is the true stand of journalism.

7. Case studies

Currently, the NYT has an infography team, which dedicates full time to build, through diverse languages, something that we can consider the future of journalism. According to information from the Brazilian journalist Sergio Peçanha, the coordinator of the sector, the team represents almost 1/3 of the current editorial configuration, sharing equal importance with the team of data collection and search of information in the network (Big Data's philosophy is strongly present in the newsroom). They are dedicated to feeding future long form journalism productions, and with the distribution team in social media, responsible for the growth strategies of the audience of the contents through these channels. According Peçanha, the NYT was the first newspaper to sign a formal agreement with Facebook. However, not all content is published on Facebook, just as not all products are published in full on the social media channel.

An important piece of information provided by Peçanha during the interview is that “the NYT is aware that the future of communication is in the use of the image (photography and video) and, therefore, has dedicated to trying this model”. Moreover, he completes: “In this scenario, data journalism is fundamentally adopted.” Still, according to Peçanha, such information is obtained by the audience metrics obtained full time by a team responsible for these measurements.

I point out that *The New York Times* has produced perfectly characterized reports as transmedia journalism. One of them is the report *What I saw in Syria*, made by Declan Walsh, and produced by Jon Huang and Sergio Peçanha himself. The report includes video, photography, infographic, text and audio, as well as the ability for the user to share and comment on the news at any time. The report accurately fulfills the newspaper's concerns about the likely language format of journalism, leaving the image as the protagonist of the information, with audio and text as complementary supports of the narrative. For this, it bets on a high quality aesthetic and informative quality in the photographs, besides audiovisual images produced by a mobile device and infographic information, as well as a constant hipertextual narrative, as defined by Landow (2009).

Another example of contemporary transmedia journalism is the Brazilian newspaper *Folha de S. Paulo*, which since the end of 2013 has dedicated efforts to experimenting and understanding this kind

of language. Concerned about the future of the newspaper, and its real survival, Folha has devoted little effort to this, if we compare the American companion. However, the results obtained in terms of experimentation have been broad, and complemented by small weekly reports produced by the newspaper in its news portal - UOL (the most importantainternet in Brazil in terms of audience) - through special UOL Tab. It is a matter of experimenting modestly with the transmedia journalism, adopting in its productions, including (often), gamifying as a philosophy of cognitive construction. The newspaper is also retaining long form reporting for transmedia journalism, following NYT narrative and aesthetic trends in Snow Fall.

The first transmedia report produced by Folha de S. Paulo was *A Batalha de Belo Monte*, in northeastern Brazil. Written by five journalists, the newsroom experienced a new way of producing journalism, involving a designer, as well as a programmer. The report also experienced a new relationship with production time, since it was spent about 30 days to finalize the platform, which featured the launch of a virtual character - the *Folhacóptero* - present in other reports to offer the reader an overview on environments.

In this report, a gamification experience was constructed in which the user became player and flew over an area of the plant, accumulating points when passing through rings, some of them complemented by a graphical information in the sequence (from statistical and metric data On the plant). However, varieties of language platforms that have never been explored in any production of the portal, even in the most important hypermedia productions, were explored in this report. We see, in the article, a valorization of the image as protagonist of the information, although shared the protagonism with the traditional text. Still, the published photographs show a high aesthetic and informative level that were not found for some time, since they were accustomed to be positioned as complements of textual information. In the report, they returned to play an informative role, as seen in the past of photojournalism. This is in contrast to the concerns of journalist Donald R. Winslow during an interview with *The New York Times* portal Lens in February 2017. In the interview, Winslow talks about the uncertain future of photojournalism, considering the growing multiplicity of journalist's activities and that now the photographer is not just a photographer. However, we see through the report that the photojournalism returns to lead the news, and that the journalist now needs to know how to photograph, besides writing.

There is still a major challenge related to the formation of the contemporary journalist. The professional must acquire the relevant knowledge to understand issues related to journalism and humanities, but also must be able to develop logical reasoning and set programming routes through binary code and algorithm. These, however, are not specific activities of the journalistic work, but the professionals must at least know their possibilities to, from that point on, define the routes together with the specialists who are part of the interdisciplinary team of the modern newsrooms. It is still a question: How do you organize such training, appropriate to the needs of contemporary journalism? The challenge is presented.

8. Conclusions

Journalism, as well as other areas of communication, has witnessed a lot of changing processes since the advent of the internet, and especially after the development of what is known as web 2.0, where participatory processes emerge. In this new scenario, the production and circulation of information changes its conditions, as well as the communicational actors, who are now also citizens in a general way. The medium beings, presented by Gillmor (2005) are walking through the “new media” of Levinson (2012) and surely working on mobile devices (Renó & Flores, 2012) together with journalists on their mobile devices.

Transmedia journalism was no more than wishful thinking in 2012, when Denis Renó and Jesús Flores developed the (pioneering) research on the subject. At that time, thinking about transmedia journalism was something far away, still outside the realities of the profession, which has urged criticism about its possible existence, as well as the true justification of the name, since for some what was called transmedia journalism was as well as traditional journalism. On the other hand, theoreticians such as Scolari (2013) have said in his most important research on the subject that "journalism has always ben transmedia", contradicting several other authors who did not believe in transmedia journalism as something possible. For them, the transmedia was entertainment, not information, and therefore could not be considered in such a way.

Transmedia journalism is a language that provides a complex and long story construction by fragments presented in multiplatform environments, by different means, independent and related to each other, and that by a capacity of expansion by hypermedia structures offer navigability accompanied by playful experience. At the same time, it presents a connection by social means and occupies a space in mobile devices (Renó & Flores, 2012).

The practice of transmedia journalism already finds technological partners, but still seeks a space in newsrooms, each day more concerned with finding a language that interests contemporary citizens. However, it also seeks a business model that can survive in the face of changes in contemporary communication.

Nevertheless, with so many changes naturally developed by society, transmedia journalism continues to provoke controversy in various spaces, academic or professional, as it proposes a change of language aimed at digital citizens living in a world still dominated by analogical citizens. However, these changes are inevitable and criticisms, when justified, serve as the basis for a development based on the reflections.

However, in these changes, data journalism has gained importance, perfect for the transmedia language. Data journalism presents an intense result of information and must be published in a way that is pleasant to read, as well as diverse. In this sense, transmedia journalism is ideal for that, since among the characteristics of the language are the multiplatform distribution navigable (expandable) by independent but related contents. In this sense, TAB specials (produced weekly by the UOL portal in Brazil) have experimented with the participation of users in real time, strengthening the transmedia as content and multichannel language and providing a greater circulation of contents in social media. As seen in the case study.

Society is increasingly interdisciplinary and its desires in the field of public opinion, and Lippman's ideas (2010) cannot be met only by the traditional way of communicating. To this end, new ways of constructing journalistic discourse are becoming more present in the communication processes, whether by new formats (gamification, animated infographics, interactive maps), new platforms (smartphones and tablets) or by contemporary languages (hypermedia, transmedia narrative).

To work with these tendencies, the journalist needs to know other technologies, and not only those that learned in the faculties until the days of yesterday. When it is proposed "yesterday" in fact, it is to remember that some universities, especially in the United States and Canada, the changes came. In these centers of journalism development, such as Stanford and Columbia, it is increasingly common to find students of journalism in algorithm classes, statistics, programming logic, among other topics previously intended only for engineers and other students in the hard sciences.

However, while these journalists are not ready for the professional market, newsrooms change the homogeneity once built by journalists, opening space for professionals in the field of technology and

even mathematicians or professionals from other areas of the human sciences, such as sociologists and philosophers. As an example, we can take into account the Laboratory of Journalistic Innovation of the Journal of Navarra (Spain), where these professionals develop the contents resulting from journalistic research from the concepts of data journalism, and others.

In fact, journalism has changed. Among other changes, we may highlight the new formats of production of journalistic reports with multilanguage and a different way of considering the distribution by users, baptized readers or receivers in the traditional media ecosystem. These journalistic experiences work under the language of transmedia narratives, and therefore offer content in novel platforms, such as gamification and comics.

With that, citizens can immerse themselves in a space between entertainment and harsh information. Although some journalistic academic currents do not consider this possibility, theoreticians such as Marques de Melo (1985) accept comics journalism as a format of opinion journalism and journalistic reporting. The idea finds support in the ideas of Lippman (2010) on the construction of public opinion and with what Kunczik (2002) has proposed to understand journalism, in addition to putting in the circuit other professionals involved in the construction of information of public interest.

In this revolutionary scenario in the field of journalistic communication, where transmedia narrative has gained space, data journalism is appropriate, since it offers diversified content that makes possible the use of a diversity of platforms through cognitive independence in news fragments, although Related issues (Renó & Flores, 2012). However, faced with this idea, the question posed by Dader (1997) arises in promoting the debate on precision journalism: is there any journalism without data?

In fact, when data journalism is considered in this thesis (as well as in other academic studies and in the journalistic market), we consider that the roots of this format are the techniques adopted to work with the data, from the search, extraction, cleaning, analysis and visualization, as studied in this paper, as well as the construction of multiplatform contents, as found in the various reports studied.

Data journalism is a current trend, but more than this is a long-standing way of working, defended and disseminated by Philip Meyer and other journalists. This work had a theoretical and practical immersion for the development of a web page as a support tool for the topic.

This way of doing journalism stimulated the development of this study. To do so, we began a deepening in the subject through courses and studies. One point that stood out in these courses and studies is that there is a confusion about the name assigned to data journalism, which is called in several other ways. To each new theory or application, a new terminology arises.

Another term that undergoes interpretations in its real terminology is the algorithm. Note that in the journalistic medium the word algorithm is used for any software involved with data journalism. The algorithm lags behind software, but as an initial structure for building them, a recipe for making a dish. Not a magic formula for everything.

In this research, we can consider that the fundamental point found is that contemporary journalism requires other knowledge, in addition to those classically taught in the faculties. It is fundamental to put the race within a current media ecology, where information on statistics, algorithm and programming logic become fundamental. This has happened in other times of the development of journalistic communication. The arrival of radio and television, for example, journalists came to live with engineers in newsrooms.

The difference is that in these moments of the media ecosystem the professionals shared the object, but with distant activities. Now the merger is in the production of research content, especially when building content with complex data for long texts, as can also be found in spaces such as The New Republic, which has as its proposal the deepening of journalistic information.

We hope that the result of this study can serve as a reference for new studies either related to data journalism, in the theoretical or applied. Studies on the subject are still incipient, but fundamental we consider the contemporary media ecosystem, where society is increasingly interested in participating as actors in the processes of information and knowledge construction.

Still, there is a question: are the contemporary newsrooms prepared to take on the format here presented? This is not about trying to make technological investments and professional training. The unknown is in the reactions of journalists, accustomed to living with sources and information from a different hierarchy, where the media are in a stratum above the receivers. Every day we have fewer receivers and more users, that is, the base stratum of that hierarchical pyramid is disappearing, while a stratum of citizens interested in taking an active role in the construction of the news emerges. The answers to that question may emerge over time, but every now and then editorial offices are looking for answers that point to the future of journalism, not only about possible business models, but also for languages and new ways of doing the work of the profession against contemporary social expectations and media ecology.

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9. Bibliographic references

C Arcila Calderón, M López, J Pena (2017): “El efecto condicional indirecto de la expectativa de rendimiento en el uso de Facebook, Google+, Instagram y Twitter por jóvenes”. *Revista Latina de Comunicación Social*, 72, pp. 590 to 607. http://www.revistalatinacs.org/072paper/1181/31es.html DOI: 10.4185/RLCS-2017-1181

M Bakhtin (1997). *Estética da criação verbal*. São Paulo: Martins Fontes.

GM Chen (2012). Hurricane Isaac coverage shows the promise of hybrid model for news. *Nieman Lab.* Available in: http://www.niemanlab.org/2012/08/hurricane-isaac-coverage-shows-the-promise-of-a-hybrid-model-for-news. Access in 10/01/2015.

JL Dader (2014): “El periodista, entre el Poder”. *Revista Latina de Comunicación Social*, 69, pp. 637 a 660. Disponible en http://www.revistalatinacs.org/069/paper/1028_UCM/31es.html. DOI: 10.4185/RLCS-2014-1028

J Flores (2014). *Ciberperiodismo: nuevos medios, perfiles y modelos de negocio en la red*. Lima: Fondo Editorial USMP.

D Gillmor (2005). *Nós, os media*. Lisboa: Editora Presença.

H Jenkins (2009). *Cultura da convergencia*. São Paulo: Alephe.

M Kinder (1999). *Playing with power in movies. Television and Vídeo Games: from Muppet Babies to Teenage Mutant Ninja Turtles*. Berkley and Los Angeles: University of California.

P Levinson (2012). *New new media*. Nueva York: Pinguim.

L Manovich (2013). *Software takes command*. New York/London: Bloomsbury.

F Martinez (2013). "Del periodismo digital al periodismo transmedia". Revista Latina de Comunicación Social. 67. Disponible en http://www.revistalatinacs.org/067/alma/08_mayo/03-resena-fatima.html

D Renó (2011). *Cinema interativo e linguagens audiovisuais interativas: como produzir*. Tenerife: Editorial ULL.

D Renó (2014). Transmedia Journalism and the New Media Ecology: possible languages. In: D Renó, C Campalans, V Gosciola, & S Ruiz (Eds), *Periodismo transmedia – entre teorías y prácticas*. Barcelona: Obierta Press.

D Renó, & J Flores (2012). *Periodismo transmedia*. Madrid: Fragua.

J Thompson (1998). *A mídia e a modernidade: uma história social da mídia*. Petrópolis: Vozes.

E Tufte (1990). *Envisioning Information*. Cheshire: Graphics Press.

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