Journalism Visualization Devices: Six Visual Modes of Seeing
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Abstract

The growing number of visualization devices in the online journalism world draws attention to the mechanisms both technical and symbolic that build the relation between the producer and the user in the interaction with the device. This relation has been studied in different approaches and empirical research; some of them related to the visual studies field. This paper aims to contribute to the study of the visual aspects of this relation through the analysis of the implicit representation of the user that the producer depicts into the device. This symbolic approach tends to find the guidance operation for interaction as a prescriptive model of information consumption focused in the visual representation. This paper proposes six-visual modes for this guidance operation as the established models in the current online journalism: (1) visualization of events, (2) visualization of hidden issues, (3) visualization of spaces, (4) visualization of narratives, (5) visualization of the subject involved with data and (6) visualization of convergences. These six modes are defined and their characteristics explicated.

Keywords

Computer-Journalism, Data Visualization, Visuality, Visual Modes, Online Newspaper.

Introduction

In the last fifteen years online newspaper have included a growing number of visualization devices borrowing techniques, software and knowledge from the science to the benefits of the investigative journalism; a movement that receives names like data journalism, computational journalism, journalism as programming, etc. Nevertheless, theses devices includes certain ways to know and see as West et al. (2015) remind us in her analysis of the gap between the capabilities of data technology and traditional representations of data in media, art and society. She argues that we are facing a crisis of representation due to the prevailing of certain framing narratives in the choise of algorithms, statistics, representational schemas, displays, interaction technologies, and metaphors for processing and representing data. But before discarding these framing narratives we attempt to analyze them for the purpose of find the prevailing ways of see into the Journalism visualization devices (from now on JVD) and its way of guide the audience towards a point of view. We decided to proceed with this approach with the aim of find both the cultural origin of the visual communication practiced in the newsrooms and the social representations depicted into the visuality of the devices which makes sense and set the relation between the producer and the users.

For Segel & Heer (2010) data stories offers new techniques for telling current news due to their interactivity, capability of verification and alternative explanations. In their study, based on 58 collected examples of visualization devices, they gathered these techniques in seven genres: magazine style, annotated chart, partitioned poster, flow chart, comic strip, slide show and film/video/animation. This seven-genre system highlights the graphical and interactive elements present into a visualization device, though giving less attention to the experience of the reader. The Segel & Heer approach shows the visual elements of the interface as a non-linear-reading process opposed to the linear-text storytelling. In this paper we are going to put in practice a complementary approach to find the visual guidance symbolically built into the JVD with the purpose to expose the user experience that data journalists suggests to the news readers. This approach follows the *visuality* concept, which describes the way cultural objects speak for himself through a visual mode as J. W. Mitchell (1986) pointed out. Every cultural object shows its own visual mode depicting specific stagings, communication models, plausibility methods and social inscriptions. Therefore, interactive images, digital devices and technology developments present their own visuality as part of the contemporary culture. In addition, we take the concept "position of the viewer" analyzed by Kress & van Leeuwen who show that "the interactive meanings

are visually encoded in ways that rest on competencies shared by producers and viewers" (2006: 115).

In the first place, The JVD have been derivate from scientific-data visualization, which involves a set of technical abilities that can transform non- visual-nature data into visual expressions. These technical abilities allow throwing light upon some information both making it understandable and showing unknown facts or events. Besides, they take advantage of representational schemas or metaphors like maps, organization charts, narrative models, etc., to organize database information and produce cognitive reactions to the viewer. Lesage & Hackett (2013) point out that data journalism is mediated through discourses and practices from computational and journalism fields that relies on the social scientific epistemological traditions and expertise, including the journalistic ideals of objectivity, transparency and accountability.

Likewise, Edward Tufte (2006) suggests that data visualization aims to discover new knowledge, in the same way, the device that support it operates like the proof of that knowledge. Hence, visualizations devices combine two elements: the new knowledge accomplished and the device serving as evidence. This dual nature makes visualizations complex but not obvious objects. Complexity comes from the link of the new knowledge with certain visual expression creating a logic relation; that sort of relation is special because knowledge and expression hide behind each other, not allowing questioning their own existence. The task to discover visuality into the JVD consists of isolating visual expression from accomplished knowledge. This approach allows perceiving the socialforces footstep (like cultural and historical), which contributes to form the meaning and the communicative intentions from the producer on the JVD. The viewer accepts to play the role not only through the interactive possibilities offered in the interface but also by a particular visual mode.

The sorts of JVD visual modes are not alike; everyone has its owns interactive characteristics and its specific depicting features. This study analyzed 116 JVD produced between 2010 and 2012, which were awarded in the online category of Society for News Design´s Malofiej Awards. The analysis heads to the identification of six visual modes that show a strong presence within the selected corpus. In this paper we will display one JVD instance for each visual mode in order to describe the role suggested by the producer and the guidance for interaction as a prescriptive mode of visual-information consumption.

Visual Modes of Journalism Visualization
Visualization of Events

In this visual mode the interface works like a prosthetic eyes, which can view either beyond the natural vision (physiological) or what could not be seen due to its representational characteristics like engines, components, outer space, nanotechnology, etc. The prosthesis leads users to have a close view of the represented object and get an in-depth exploration of what is in front of eyes. This symbolic mechanism encourages the user to leave the limits of daily life view in order to open the eyes to the evidence exposed by the JVD and its arguments.

In some cases, the JVD depict visual instruments like telescope, microscope, even imaginary instruments able to trespass through walls, components, compartments and machinery parts. In other instances, the JVD allows to accelerate, slowing or repeating a video action with the goal of finding details, measure changes or just to appraise a social practice. This mechanisms work together with social science methods introduced by Philip Meyer in the newsrooms in the 60´s and called Computer-Assisted Reporting —CAR (Gynnild, 2014)

The JVD offers the user to embody an expert view, it means to take the glasses from specialists like judges, trainers, referees, polices officers, engineers, architects, etc., with the purpose to analyze data or events as an expert. In this symbolic movement the JVD not only use numerical data as their primary news material but also create a narrative structure, which user is the star actor bringing to light the information that a regular person couldn´t recognize. In the way to reinforce this representation the JVD interface depict control and measuring instruments to evaluate, estimate, judge, or supervise the information.

In the case of *El Juicio a las Juntas* (Figure 1), the interface penetrates the trail room where Argentina's ex dictators had been prosecuted for crimes against humanity. The JVD transport the sight to a place where offers a data-sensory experience, an emotional bonding with the trail and the awareness of the historic moment.

Figure 1. El Juicio a las Juntas. 2010, Argentina. ©Clarín

Visualization of Hidden Issues

The second visual mode brings to reality facts, information or patterns that would have been impossible to know in a non-visual way. The JVD reveals a hidden issue like discrimination, injustice or unfair treatment thanks to data patterns (like accumulation, reiteration, etc.) or statistical evidence (like time and space variations, etc.). The pass from invisibility to visibility occurs highlighting the unexpected knowledge and open it to public debate. This visual mode matches with traditional statistical journalism, which pursue to discovery the news behind the public data. Usually, this sort of "stories" strongly influences the media agenda and forces the investigation of the revealed issues (Parasie & Dagiral, 2012)

The visualization of hidden issues operates to raise awareness in the newsreaders about the size of natural disasters, responsibility for the planet, causes and effects of political decisions, etc. The readers should follow the path of discovery to check the argumentation and get the conclusions. This sort of JVD draws its explanation power on data evidence due to the use of data mining, data mapping and cross-referencing databases. Therefore, the user's involvement is not related to the immersive mechanism but for the argumentation.

Besides, interface makes use of visual conventions like pie charts, data tables and bar graph, etc. that enables to shape a new data into a familiar one. As Norman Bryson (1991) remind us in his critical study of vision, the use of codes of recognition allows to identify an object into the social landscape and therefore to be able to see. Once the news explanation is clearly viewed due to visual conventions it embeds into the general knowledge.

The JVD *How Mariano Rivera Dominates Hitters* (Figure 2) shows, for instance, the use of accumulation patterns to unveil the play style of the invaluable player of the New York Mets. This JVD attempts to reveal the special Rivera´s techniques due to the mix of data retrieved by The Movement Lab, the argumentative explanation exposed by the narrator and the video image sequence. The JVD discovers what is almost impossible to see for a regular person unless he has trained eyes.
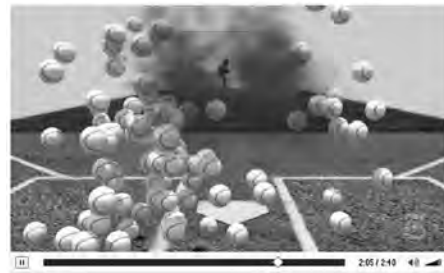

Figure 2. How Mariano Rivera Dominates Hitters. 2010, USA. ©The New York Times

Visualization of Spaces

This base-on-maps visual mode carries the user´s view into geographical spaces to collect data from the locations and find out some unexpected information. Maps usually displays some paths guided by visual and interactive tech-niques like trend chart, zoning and flow charts in order to discover the "story". In this case the upper interface layer —the annotation layer, which attaches labels for name places and measure distance— creates a framing vision of the territory using text boxes and graphic symbols. The JVD sacrifices a free-travel around the map for a guided story about places. In addition, map representation sug-gests to the users a dispassionate and natural view thanks to a group of conventions such as: Planimetry, scalability, point of view, observation distance (generally simulation of a satellite view), georeferencing and sociodemographic segmentation. All these technical elements improve the JVD´s plausibility and ease the user to achieve the agreement with the argument.

The art historian Ernst Gombrich (1982) refers to map´s view like a world selective gaze caused by pre-established symbolic determinants, like conventions, for the sake of simplify representations. Thus, in the map acts an insequence view of the information, which allows following varied routes into the map. In the same way, the map is a vestige of what cartographers saw as spatial proportions and identification of objects in the past. However, it must be taken into account that maps entail both a distortion and adaptation of reality. This idea sends the analysis back to the Jorge Luis Borges´s paradox about the scale between map and territory expressed in the short story *On exactitude in science* (1946). This story shows the impossibility of a perfect land representation because the maps just would duplicate the referent; hence the map representation can be only partial.

For instance, the JVD *Election* (Figure 3), which accompanied BBC´s live broadcasting of British voting in 2010, present a dynamic distribution of space according to the electoral results and the balance of power. This JVD compares different states or zones of events to draw the new map of power. The map represents each electoral district by a hexagon colored by the winner-party color. This adaptation creates not only a new British map but also an unbalance party-power distribution.

Figure 3. Election. 2010, UK. ©BBC

Visualization of Narratives

The features and advantages of narrative audiovisual structure offer support to this JVD visual mode, not only proving the argument exposed through the sequence of images but also arousing users' emotion and interest thanks to the *mise-en-scène*. In the field of argument, some visual and audiovisual techniques helps to validate the data like: appearing and disappearing images, highlights, acceleration and slowing of video clips, shots, sequences and scenes from the audiovisual language, etc. Moreover, the narratives structure frequently corresponds to a classical Aristotelian organization integrated for three acts: setup, confrontation and resolution. This structure links ideas, opinions, explanations, jokes, etc., to drive the story to a conclusive argument as a result of the linkage. This classic structure often arranges a confrontation between two opposites: the past against the present, right against wrong, myth against reality, etc. These confrontations reinforce the argument and lead the user to a logical conclusion.

Video techniques prevail in these JVD, even though they limit interactivity. This happens because video is an accessible and familiar format that requires only a passive-watching spectator. Arguments like editorial positions and abstract concepts such liberty, justice, patriotism and victory are convenient for being performed in this visual mode. In addition, an extradiegetic narrator organizes the story mixing archive images and showing them according to the script; this mechanism is proper for event reports, recaps and historical accounts. The image, in this performance, works as auxiliary of an argument drawing the visual elements to explain the central point.

These elements are performed in the JVD *Snow Fall* (Figure 4). The story tells the tragic moments lived by a group of skiers in the middle of an avalanche in Washington. A long-scroll rolls out five chapters of the story, each one including several multimedia elements such short videos, landscape photographs, graphics, maps, photo galleries, audiotapes, etc. All the elements are arranged by a structure script that heads the story in many details and emotional experiences.
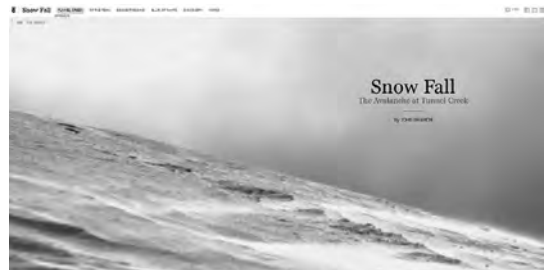

Figure 4. Snow Fall. The Avalanche at Tunnel Creek. 2012, USA. ©The New York Times

Visualization of the Subject Involved with Data

This sort of JVD enables users to get involve with data in such point that the subjectivity is also involved in. This visual mode matches with the Gynnild (2014) analysis of the data-journalism entrepreneurial approach, which claims for the idea of "journalism as programming" or the data-base as the locus of news attention. In this approach the user is in front of a non-mediated contact with raw data and the journalist accountability function is replace by algorithms. Parasie & Dagiral (2012) pointed out that these programmer-journalists take distance from the traditional conception of "story hidden in data" and claim for news as computer-processable data.

In the users field, this visual mode aims for the improvement of data searching. The contact between data and the user promotes a sense of control that enhances the sensorial immersion into the device. This user-data meeting creates personal and temporary significances different for each user. Therefore, the user generates the story of its own experience with data through the dramaturgy and staging provided by the JVD. According to Arlindo Machado (2009) the user projects its feelings on the screen, like in the case of videogames, in order of pursuing a new experience into the device, which only get results from a negotiation between the user and the software. Thus, the experience shapes the memory of the contact with data. In terms of time the user experience is endless, however the user defines duration of the experience as well as the starting point, rhythm, speed of ride, and closures.

This sort of experience could not be completely either planned or reckon by the producer, in many cases it depends on the capability of the device to allow the user project his imagination and interest on the interface. For instance, the JVD *World Cup Twitter Replay* (Figure 5) shows Twitter-users reactions of each match in the 2010 FIFA world cup. This JVD simulates a new game lived in parallel while the real one was being played. Twitter users act like players of its own virtual soccer team and match due to the real-time interface. In this stage personal data mix with database information building new —or at least unexpected— information. In this way, users become part of the news.

Figure 5. World Cup Twitter Replay. 2010, UK. ©Guardian

Visualization of Convergences

The last visual mode study in this paper operates through the translation of terms from one system to another, providing the same value of data (equivalence) in two different stages. In this case, a journalist or an expert does not produce the translation, instead it comes from a programming calculation that makes to converge datasets from databases with personal information introduce by user. It is consistent with Henry Jenkins convergence-culture concept whereby different media-content-flows are connected in technology platforms to produce experience and new significances. According to Jenkins (2008) the convergence encourages the users participation, interactive collaboration and collective intelligence. More than a simple technology concentration, convergence is a cultural action grounded in media technology that works like a social articulation.

This visual mode is more suitable for users´ personal searching than journalist stories. Users in front of this JVD must show dynamic attitude, participation skills and collectively sharing, even promoting activism and fanaticism. The activist attitude rejects the journalistic mediation and pursues for a self-constructed conclusions. A mix of skepticism and enthusiasm heads the users to reach the desired data experience. The JVD *Is It Better to Buy or Rent?*

Figure 6 visualizes the users' data (real or simulated) with database information to offer answers about the real estate market in NYC. The answer helps the user to build future scenarios, foresights and forecasts. The

visual experience does not exist until the user feeds the interface with personal data.
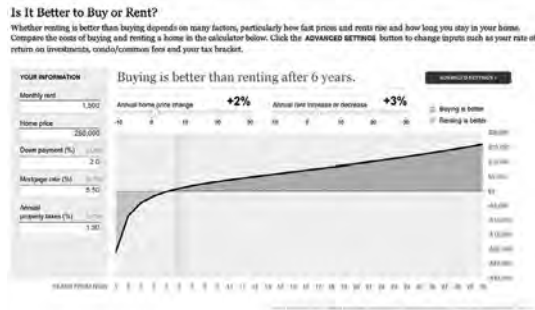

Figure 6. Is It Better to Buy or Rent? 2010, USA. ©The New York Times

Conclusions

This paper presents six visual modes of JVD identified from a corpus of some award-winning examples and analyzes the interaction of the user with the device, not only in a practical way, but also in a symbolic relation. These visual modes merge elements from the journalist tradition and technological improvements in the production of JVD. As a result, the current JVD not only explores new technical mechanism to access, decode, understand and present data, but also reinforces the journalistic precedent modes of report visually. Therefore, JVD production is more complex than a technological update, it implies to search and chose a desired experience for the potential users in a multiplied background of visual languages and ways of make sense. We are sure about the existence of an array of varied visual modes in JVD, different of those we discuss here, but the study shows that these six are the most established visual modes used in current online newspaper. Then, It is important to questioning about the mechanisms that privilege a group of visual modes over others.

The user experience with the JVD ranging from the visual aspect to the interactive behavior is complex alike. The user is invited to take some actions in view of get a complete experience with data and stay informed, but, at the same time faces a bunch of discourses represented through images, actions and data. As Lesage & Hackett (2013) pointed out, the technology, organizations and symbolic characteristics of online newspapers mediates data in such way to make it problematic. The six visual modes indicate that the way of seeing news affects the information in the same way that discourses affects our sight. To put it differently, to view information through JVD is a cultural action instead of a technological one. Moreover, the prescriptive models of guidance through the JVD involve more than a neutral consumption of information, it carries values, ethics, ideologies, etc. expressed in visual terms.

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