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communicating
complexity

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Visual Archives and Infographics: new Connections

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Abstract. The present article is part of a broader study that frames the concept and creation of visual archives for online press, in relation to infographics. In addition to being an operative discipline, Design presents itself as a theoretical response, through the analysis of conditionings in society and the anticipation of new communication processes.

By presenting and promoting the practical and theoretical investigation in areas such as design and visual literacy, with specificity on infographics – a multidisciplinary area in constant evolution –, we intend to reveal how we can communicate complex information content visually.

Focusing on online press infographics, we propose to establish a new role by relating it to visual archives.

Nowadays, the Internet offers various resources for online archives and databases. In the interest of preserving content and data, various archives are, currently, committed to digitizing their information. Various governments, in a methodical manner, have made budget and government decisions available online. Other examples, like Google, are also a vital source of information. However, correlations are dispersed and its logic is presented based on textual parities or presented in datasets that only make sense to a scarce number of people.

Archives, as a specific field in information, should propose systemic constructions between content and meaning. This is the underlying premise, when we question in what measure can archives, by becoming visual, solve flaws in communication. At the same time, the subjacent objective of most information visualization is to organize and clarify mass volumes of data. Based on this definition, it is a field that has impinged it self in the concept of archive. We will begin explaining the connections that make information visualization fertile ground for this concept, by decoding the definition and objectives of archives. After, through authors and case studies, we will analyze how they can influence new platforms of communications and reinforce new options for online press infographics.

Keywords: Visual Archives / Infographics / New Media

1 Introduction

The present article is part of an on-going investigation within a PhD programme in Design that frames the concept and creation of visual archives for online press, in relation to infographics. Methodologically we present reference to case studies and authors who develop work within information visualization and infographics.

It is a research within the areas of design, visual literacy and, in particular, infographics, where we discuss how we communicate visually. Focusing on the specificity of online newspaper infographics, we propose to establish a new role by relating it to visual archives.

In addition to being an operative discipline, Design presents itself as a theoretical response, through the analysis of conditionings in society and the anticipation of new communication processes. More and more, we face a new reality, a mutation in the relations between people, objects and images, witnessing what Lipovetsky refers as a “new phase in the history of western individualism” [1].

We move into a new paradigm, where we abandon a period of automation of processes – a feature present since the Industrial Revolution – and walk towards an automation of information. One of the consequences is the need for greater clarity and progressive information systematization when we are in the presence of the multiplicity of data to which we have access. In the age of “information overload”¹ [2] we can say that the abundance of information and how we organize it is, above all, a problem of Design and, in particular, of Information Visualization.

2 Archive

Following an initial premise, we question how archives and knowledge are structured and created.

Theoretically we explain the acquisition of wisdom following, traditionally a sequential model: Data > Information > Knowledge > Wisdom (DIKW) (Fig. 1). We see that this operative model calls for itself certain types of logic, where data is presented in a linear manner, in sequence, like the information we find in books. However, something different occurs when we are confronted by the diversity of sources available online.

¹ Information Overload seen as an acceleration of technology that results in a change in the social fabric.

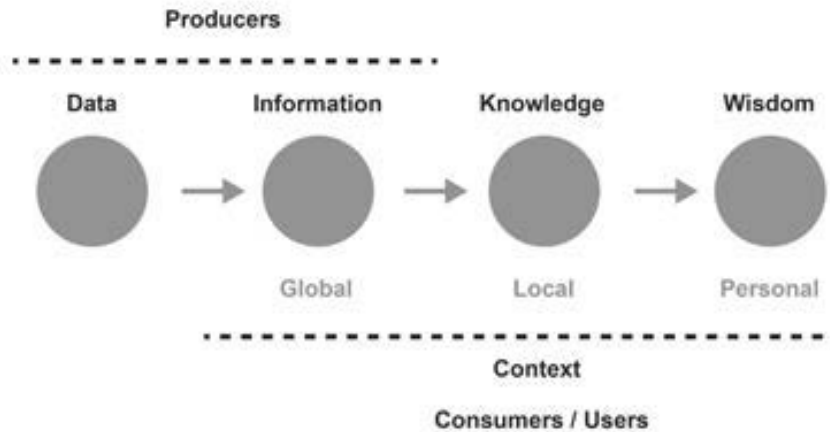


Fig. 1. Knowledge Spectrum. Adapted from Nathan Shedroff [3].

On one hand, whether on the computer or Internet, we're in the presence of an automation of data. On the other hand, its constant presence and accessibility does not make data easier to locate. Database search presents disperse references in various sources, decentralized, our without a hierarchical order. The structured order that commonly inhabits books is not a certainty in online context. As the amount of information increases, our ability to distinguish and attribute meaning decreases reciprocally.

According to Kryder's Law²[4], the ability to storage (bits) in smaller and smaller computer hard disks doubles every eighteen months. When we are faced with the moment our computers have the ability to store or contain every book ever written, it should be recognized that the means of organization available might not be adequate to facilitate access to such data.

This fragmented reality intersects with what Lipovetsky [5] mentions as a tendency of 'interactive' systems to increasingly customize access to information and images.

In the words of Weinberger [6], a new paradigm is recognized when our foundations of DIKW are shaken. The orderly logic presents itself, in post-modern era, and especially with the apogee of the Internet, increasingly frail. The increased of diversity, interaction and information through private options is privileged.

However, following the notion of archive, the dynamics of classification, connection and relation to data are essential to the caption of content and meaning. The logic needed to acquire knowledge is not necessarily altered, but the means available are. Producers and Users are active pieces in the "management and creation of new knowledge: they classify, connect, comment, correct, edit" in-

² Mark Kryder – Professor in the Electronic and Computer Engineering Department at Carnegie Mellon University.

formation [7]. We can go further and add that they store and archive, since the human condition has a latent need to register and store diverse types of data for posterity.

Based on a definition by Schuller [8], archives are considered “a place to systematically record, sort and manage documents, images and media for permanent preservation”. This methodical and professional information retrieval is usually performed by a group, society or nation and often influenced by “economic and political interests, and presented as a social act in our changing society” [9].

In the interests of preserving contents and data over time, there are currently several archives involved in digitizing their information. Several governments have release their budget decisions online, as is the case of *Data.Gov.uk* in the United Kingdom (Fig. 2).



Fig. 2. Data.Gov.uk.[10]. Website that presents UK’s government budget decisions.

The internet, associated with the need to preserve data, allows online access to multiple databases and forms of archive, like Google, but does so based in textual parities, and presents them mainly in the form of text our datasets³. Again, data is always present, but reading it constitutes a difficulty. The datasets are usually accessible only to experts who know how to transform and interpret. It is necessary to create languages that translate it into more readable formats.

Archives, as an information domain, should propose systemic constructions between content. It is essential that new models appear, and in that context, information visualization can be seen as a solution.

³ Datasets are present in many newspapers. The Guardian not only presents infographics but also releases its datasets.

3 Information Visualization and Infography

In the 1980's the development of computer desktop publishing implied new practices that revolutionized editorial creation in the publishing world. Likewise, the World Wide Web implies new practices in information distribution [11].

It is common to hear that we live in a visual culture, and received our information from images, due to a long and steady textual heritage. It is not common to see it taken as a form of literacy, in other words, information conveyed "through images as well as texts and numbers" [12].

Information Design represents visual data with the intent to "communicate, document and preserve knowledge. It deals with making entire sets of facts and their interrelations comprehensible, with the objective of creating transparency and eliminating uncertainty" [13]. Also, Media has become increasingly interactive, capturing the human tendency for network communication and individual appropriation of meaning. The visualization of information is a visible response, a new medium and "new scale that is introduced into our affairs by each extension of ourselves, or by any new technology" [14].



Fig. 3. Dynamic relation between Information Design and Infographics for online news. Adapted from Alberto Cairo [15].

The fields of information and infography (Fig. 3) constitute a multidisciplinary aggregation⁴ and a growing discipline. Information needs to be contextualized and infographics tends to solve our 'thirst for data', in other words, the human tendency to catalogue and collect information.

The power of infography is to transform data into knowledge and to access it visually (Fig. 4). By associating the concept of archive and taking it as an ad-

⁴ Combines disciplines such as visual perception, color theory, psychology, sociology, engineering, design, among others.

Pattern design, in this respect, should not be seen as a finite system, but a living structure in constant evolution. This search, widely disseminated, is expressed by Chaomei Chen, who indicates that a "the taxonomy of information visualization is needed so that designers can select appropriate techniques to meet given requirements" [19]. Other authors have reflected on pattern decoding and information visualization. The continuing analytical approach is revealed in the work of authors such as Jacques Bertin, Eduard Tufte and most recently Manuel Lima. Bertin in his 1967 book '*Semiologie Graphique*' reflects on the organization of graphic elements according to the relation between data and function [20]. His work, oriented to semiology studies, is a fundamental attempt to see graphs from a "global and structured point of view, producing a consistent theory for symbols and representation modes" [21].

Tufte, in turn, was critical about the media tendency to embellish rather than achieve visual representations from the transparency of their data [22]. His analyses allow us to understand that the history of any communication device is "entirely a progress of methods for enhancing density, complexity, dimensionality, and even sometimes beauty" [23].

Finally, the work of Manuel Lima [24] shows the evolution on a network perspective rather than the printed world. It reveals a tendency to create similar patterns within different fields of knowledge such as biology, music and politics and continues the discussion of taxonomies that can be applied to specific types of work.

4.1 Aim and Expected Results

All these points connect on our proposed analysis. It has allowed to link specific types of infographics, specifically those with recurrence and online presence and that deal with one of the elements most difficult to represent, and one, that potentially increases dynamic and allows it to be linked to archives. That element is TIME. For most of recurrent news such as Elections, Olympic Games, Nobel Prizes, there is a surge of many forms of online infographics, but there is scarce continuity. They are made as isolated pieces of work, and past information within a topic is not reactivated and availed. A continuum of information is lost.

Take the examples given below (Fig.5 -10) focusing on elections; past information is considered but the structure is not conceived for continuity. Our aim is to discuss possibilities of retrieval within topics and reveal past data, thus connecting the presented definition of visual archives as a new path for online newspaper infographics.

4.2 Case Studies

The election of Barack Obama in 2008 and 2012 is an example of how information can be retrieved and adapted. If we look close, there are more correlations in 2008 (Fig. 5, 6). The map vision can compare results from 1992 onwards. In 2012 (Fig. 7) that ceases to occur; the map presents the 2012 outcome and a 2008 fluctuation analyses (Fig. 8). There is no similar visual comparison of results. The overall visual structure is similar on both, a positive point, but part of the information available in 2008, did not meet continuity.



Fig. 5. New York Times. Presidential results of the 2008 Elections in the United States.



Fig. 6. Detail.



Fig. 7. New York Times. Presidential results of the 2012 Elections in the United States.



Fig. 8. New York Times. Change in votes from 2008 to 2012 Presidential Elections in the United States.

The *El Mundo* example presents the opposite. The 2012 election (fig. 9) offers an amount of information made available that compares previous elections, since 1977. The 2008 compares only to the previous one, 2004 (fig.10).



Fig. 9. El Mundo. Congress results on the 2011 General Elections in Spain.



Fig. 10. El Mundo. Congress results on the 2011 General Elections in Spain.

The design and information quality presented in the case studies are not at stake. They are reliable infographic visions of the reality of that moment. They are taken into analyses for being recurrent news that offer the possibility of a new approach on the continuity of design and information. We proposed here to begin a discussion about the future of this specific type of news. In that specificity, infographics and visual archives can find common ground.

Another aspect is the notion of continuity proposed with patterns and taxonomies. With any given design object, continuity and familiarity with graphic elements allows quick understanding of the information conveyed. When the New York Times website was redesigned, layout indications were given so that user could adapt and adjust their personal navigation to the new design. This is key in infographics. Design stability allows better navigation. Within the same subject, once the learning curve is achieved, it can be sustained over time.

5 Conclusions

The research implies that it is necessary to create visual devices that deal with, on one hand, the visual code. On the other, that can retrieve and optimize the creation of multiple visual options with online infographic visual archives. Coherence in terms of database and metadata introduced must also be achieved.

This, we expect, is the new role for design and infographics with relation to visual archives. The invisible aspects also interfuse the final outcome, which reveals design as a response that bonds technology and visual practice.

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