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VISUAL ARCHIVES IN DIGITAL NEWSPAPERS: AN APPROACH TO VISUAL LEXICON IN AN INFORMATION VISUALIZATION PROTOTYPE

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ABSTRACT

By rethinking how digital information and media have evolved, we intend to discuss how Information Visualization is performing an essential role in the field of newspapers, and how it can evolve with particular emphasis on content archiving for future access.
The presence of new visual structures used in fields such as digital archiving, have questioned digital methods of preservation and how the interrelation between information and access to knowledge is revealed. In digital newspapers, the development of access and information retrieval processes has become an essential part of their duties, but it is still in it's infancy and dependent on text search rather then content awareness.
By outlining the links between Visual Archives and Information Visualization, with focus on online press, we venture in a path of trial and error. This is present by the recognition of lack of efficient articulation between different types of contents, as well as between the user interaction and the contents outcomes.
Thus proposing a visual lexicon that can adjust to the constraints of technology, different user devices, and the promptitude of publication that a Web context demands it is utmost relevant.
A combination of fields, with attention to visual perception and arbitrary conventions in relation to image and content awareness, grants the association of concepts such as big

data and thick data description, being part of the outcomes of this research a proposal to a theoretical model grounded on prototyping testing in a newsroom office.
This empirical methodological approach is supported by a low-fidelity prototype, for iterative formative evaluations, fostering field's observations with potential users in order to identify the best visual components of a digital visual archive for online newspapers. The challenge is to develop visual structures that preserve and present the interconnections of news, information and knowledge to be seen, accessed and linked. By making use of a lo-fi prototype of a visual digital archive we aimed, to test, re-test, and find responses in dialogue, failure and retrial. The body of work shown here presents the practical outcomes of the theoretical model.

Keywords
Visual Archives, Information Visualization, Prototype

INTRODUCTION

By rethinking how digital information and media have evolved, we intend to discuss how Information Visualization is performing an essential role in the field of newspapers, and how it can evolve with particular emphasis on content archiving for future access.
During the article we start with a view of a hybrid approach, were concepts of big data and thick data are intertwined.
Along with this view, the 'approach' is strengthen by presenting the outlining links between Visual Archives and Information visualization, in a awareness of the visual language used in online newspapers, and the identification of a visual lexicon that can better articulate the dynamic of information preservation, organization and retrieval.

A case study outline, combined with an empirical approach stemmed by the experimental lab work with P3, focuses on a path of trial and error, that has allowed us to understand which visual structures can better adjust to the digital visual archive.

Our conclusions focus on an outline of a visual lexicon and indication of their options, dynamic and flexibility, within content awareness and user interaction. Thus, allowing the development of future visual archive structures that preserve and presents the interconnections and flows of graphic contents in newsrooms.

VISUAL LEXICON

The construction of a replicable 'visual lexicon' and an 'experimental lab work in digital visual archive' based on information visualization, must be aware of how data and interfaces are managed and created. For a better understanding of the diversity of components in question we assume from Ware, the recognition of information visualization as a hybrid, "accepting this distinction between arbitrary and sensory codes" (Ware, 2004, p. 13), or respectively, social conventions and visual perception.

This hybrid supports the need to preserve not only content, but also contexts, allowing empathy, discovery, search and insight, and enriching user experience. These points operate on the basis of an anthropological approach, suggested by Clifford Geertz (1973) named as 'thick description', which is understood as a careful and immersive observation of culture. Regarded as essential by Ware (2004, p. 17) it is also characterized by the term 'thick data' in the context of data visualization by Pavliscak (2015, p.32) and digital content management by Wang (2013). We have chosen the description of 'thick data', to associate more easily to digital media.

TRIAL AND ERROR

At an early stage of our research, while still consolidating both the reality of online digital newspapers as well as the creation of visual archives, we first focused our approach of the archive as a graphic 'reservoir'. By analyzing the graphic approach to news publications reality *versus* the restructuring[1] of 'newsrooms', the study focused on the possibility of creating visual archives consisting of display models (templates) for recurrent news[2]. In this sense, the connections needed to create visual nomenclatures, a lexicon, as well as a flexible model has always remained viable.

With the purpose of allocating a sustainable theoretical basis and an equally strong practical universe, an infographic display (fig. 1), was tested on 27 May 2014[3]. It presented the results of the Portuguese European elections of 2014[4], as well as all the comparative results from 1987 to 2014.

The work, then published in the online digital newspaper P3[5], granted a visible format for an approach to archives from which conclusions could be drawn, through a formative assessment with interviews to the P3 newsroom team. One of the realities resulting from this project, was the noted impermeability of the work to technological advances. The model had a layout that was not characterized by the juxtaposition and organization of a flexible visual lexicon. Although the introduction of a timeline component legitimized the archive logic, the assembly composition could suffer from the inadequacy of the layout within the development of digital platforms.

On the other hand, the continued work with the P3 team, clarified the newsrooms needs which implied the construct of a dynamic archive platform of the their work (news), thus clarifying the objectives of the research. A deeper connection between digital visual archives and the needs of P3 was not depicted in the work exhibited. A good graphic example, but with a research assumption focused on a present could quickly become obsolete.

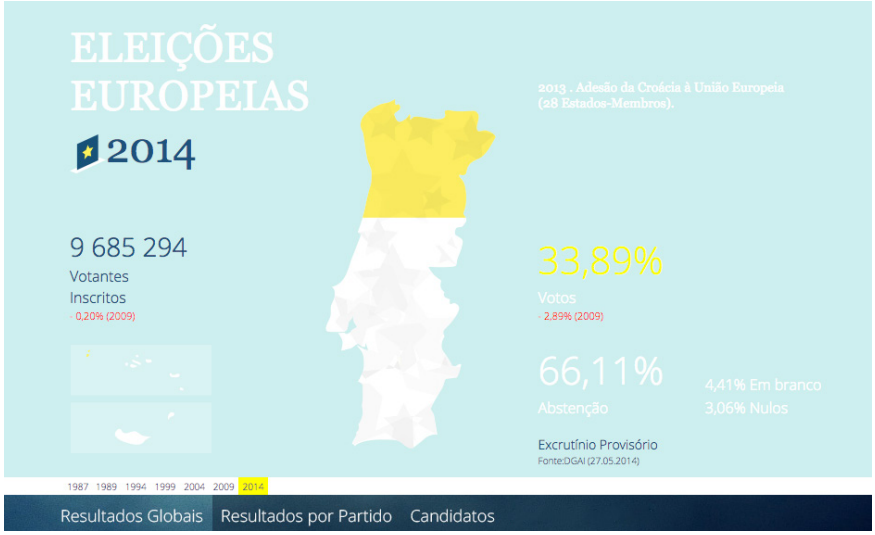

Fig. 1 *- Published dynamic infographics of the Portuguese European Elections of 2014.*

Thus we moved to propose a visual lexicon that could adjust to the constraints of technology, different user devices, and the promptitude of publication that a Web context demands and is more relevance.

The analyses of case studies, historical and theoretical development, as well as the outcomes of a practical venture, allowed the link to visual structures, with were

recognized as: maps, timelines, trees, treemaps and networks. These were then tested again as proposed elements of a digital visual archive. Even then, practical outcomes rendered inapplicable structures like maps and treemaps to the P3 reality, in a direct connection between the theoretical outcomes and the reality of the laboratorial project. But, contrary to the first formative evaluation it was not a point of discomfort on the conclusions achieved, for all the visual structures bare meaning and a reason to be applied in future visual archives. It serves as a notation that just because you have them, doesn't mean you will use them all the time or all of them.

VISUAL ARCHIVES IN DIGITAL NEWSPAPERS: LAB WORK

This empirical methodological approach, allowed the development of a low-fidelity experimental lab work, to choose the best visual components of a digital visual archive for online newspapers. The challenge was to develop visual structures that preserve and present the interconnections of news, information and knowledge to be seen, accessed and linked.

The research with P3 staff, made it possible to understand underlying difficulties[6] under formative evaluation methods, such us interviews, surveys and focus groups. Mostly, it presents a lack of cross-reference[7] to other articles in a clear-cut form. The website, as an online newspaper fulfills its complete purpose, but not as a model to enhance, connect and access continuous information (an option visible in cases such as The New York Times).

An initial experiment was developed with P3's staff insights, on what would improve their work, but with all audience[8] in mind, as it would be visible to all. The visual archive does not replace the newspaper itself; it is another tool, built in the contemporary accessibility and transparency that should be instilled in information.

On March 23 and 27, 2015 an initial presentation was made and survey to confirm the outline model[9] (fig. 2-3). Findings gathered by individual talks with the P3 team pointed to a better outline of the search engine (on the left), with focus on word tags and date specifications. Navigation changes were well received, pointing again to the search limitations that currently exist.

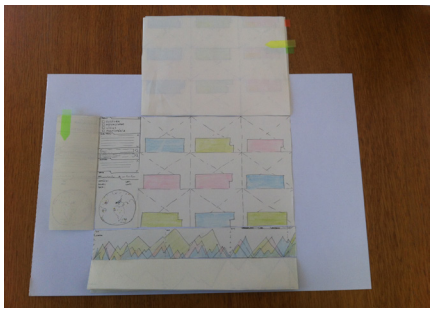

Fig. 2 *- Initial Prototype Mockup . Search mode on the left, proposing a hierarchical tree inner structure. Timeline of articles placed on the bottom and articles for selection at the center. Colors vary according to the type of news (Culture-blue; Today-green, and Vices-pink).*

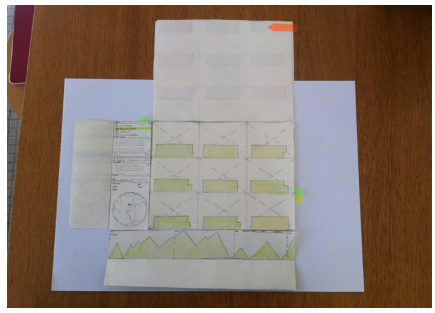

Fig. 3 *- Navigation through the 'Today' category, showing the shift of each part of the prototype.*

A second test was made on December 11, 2015, showing specific timeline navigation (fig. 4). Within the conclusions the below version was more accurate and rigorous to show the publication day of the article. The first option did not become invalid, since it could be present when an individual article is viewed, showing its lifespan. Considerations were made about the initial model, and this specific visual shift (fig. 2), with concerns with the visual language flow.

This confirmed our theoretical findings, that options to view all the parts of the navigation or just some (or one) should be included and made possible. Either through network navigation (seen bellow), timeline, search engine or article, all of them constitute visual constructs of the information available. Juxtaposition of all of them is possible, but also, and with regard to software navigation learning and adaptation, a more simplified or focused option is possible as well.

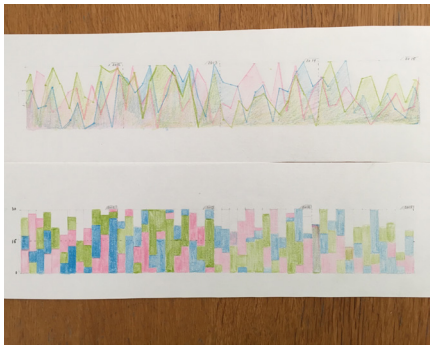

Figure 4: *Second test, Timeline for P3 visual archive*[10].

A third test was implemented on February 13, 2016. Visual structures of article organization, networks and word clouds were presented (figure 5-6).

Choosing the today (actualidade) section, the most recent options in articles are presented. Color was only applied to the titles, but with an underlying option of color on 'rollover' mode. But the word cloud option, a vision most common on institutional digital archives[11] appeared as a repetition of tag and word search, which would cause redundancy. Along the test its importance was redeemed unnecessary.

Figure 5: *Third test, Article and wordcloud view for P3 visual archive. Fernandes (2016)*

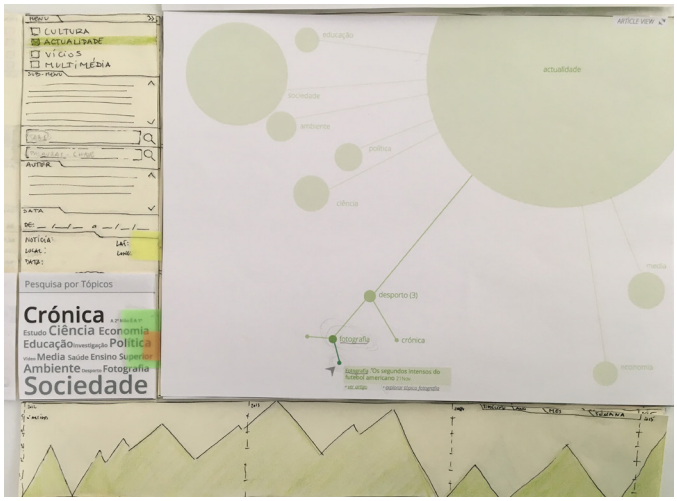

Figure 6: *Third test, Network view for P3 visual archive*[12].

With the option of changing article view, to network view (fig. 6) a very visible attraction to the navigation potential between subject matters and news categories was vividly discussed and thrillingly received. Attention to other words surrounding the circular shapes for more options, details (number of articles, access to the article itself) where proposed and seen as positive additions.

The initial testing process reveals the correct findings of our visual lexicon, and their practical applications, but it also, addresses which of them are suitable for P3, branching our finding to possible visual structures for other archives.

CONCLUSIONS

The body of work shown here presents the initial practical outcomes of our theoretical research. We realize that within the reality of P3, visual forms such as maps shown in the initial mockup, and word clouds, were not feasible solutions. In regard to maps, P3 news pertains to a local geography. The study strengthens necessities and context, not forcing visual lexicon that has no application.

As a conclusion, this bares the flexibility implied in the lexicon construct, by organizing and cataloging those structures that might be needed in other visual archives.

Within the study, future tests on specific narrative flows of each visual component, and combination between all of them will be the taken, on a continuing search for the best intelligible navigation, insight and engagement.

Our contribution aims to be connected with the creation of a replicable, adaptive and efficient visual lexicon within digital visual archives for online digital newspapers.

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NOTES

1. Newspapers such as The New York Times or The Guardian, have restructured their newsrooms due to the growth of Computer-Assisted Reporting and the creation of news using only databases.

2. Events like the Oscars, Olympic games, national and international elections or Nobel prize have an established periodicity.

3. Date in which provisional results became oficial.

4. Elections were on May 25th, 2014, and results were published on the May 27th in, http://p3.publico.pt.

5. P3 is a 'born digital' newspaper. It is part of the media group Comunicação Social S.A., based in Portugal, and its name derives from its main newspaper Público. It is oriented to a demographic aging between 18 to 35 years, and provides a collaborative spirit, very linked new media sharing and comment social platforms. More information at http://p3.publico.pt.

6. Some of them include, not being able to tackle search within their website, recurring to the use of Google for article search, and also not seeing the "lifespan" of a storyline (views, shares, and comments since it's published) in a clear and visual manner.

7. When an article is published, former articles surrounding the same tags are suggested (this is standard in various newspaper websites). In the case of P3, the related articles depend on the reporter's memory of them. Word search recognizes tags, as well as, words within the article, not presenting clear results.

8. Most importantly, as pointed out previously, P3 started as an experimental model, targeting a very young public. A information visualization archive, to enhance their experience the P3's information, would entice its public, not new to social media and retrieval processes.

9. The conclusions were part of the visual analysis along with a survey granted to each individual of the P3 team.

10. Fernandes (2015).

11. Archives Portal Europe (APE) presents a topic search using wordclouds. In https://www.archivesportaleurope.net/

12. Fernandes (2016).