Welcome to #ISOJ!

Journal Details

About the Journal

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About Us

#ISOJ – The Journal of the International Symposium on Online Journalism is an international journal devoted to advancing the scholarship in the area of journalism and innovative technologies. As the official publication of the annual ISOJ conference, it publish articles that were presented and discussed during the event. The editors select articles from the ISOJ symposia that have undergone blind peer-review as part of the symposium paper call process. Articles that are published in the journal are based on original research, methodologies relevant to the study of journalism and innovative technologies, critical syntheses of research and theoretical perspectives on journalism today. The journal maintains a social scientific and broad behavioral focus and based on the collaboration and expertise of distinguished international researchers in the field, who participate in a strict blind review process and advise the editors.

Disclaimer

The editors cannot be held responsible for any errors or consequences that arise from the use of information contained in the #ISOJ Journal. The views and opinions in the journal do not reflect those of the publisher or editors.

Manuscript submissions

The journal does not accept submissions. Articles that are published in the journal are based upon a selection made by the editors. Selection is based on papers that have been accepted to the annual International Symposium on Online Journalism, which has been held since 1999 at the University of Texas at Austin, hosted by Professor Rosental Calmon Alves, Knight Chair in Journalism and UNESCO Chair in Communication.

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Foreword

Another step ahead for ISOJ – A journal on innovation presented in an innovative ebook format

SPRING 2011

By Professor Rosental Calmon Alves

Co-editor of #ISOJ journal, founder and chair of the International Symposium on Online Journalism at The University of Texas at Austin

The origins of the International Symposium on Online Journalism are very modest. It was a very small conference when it started in 1999. Since that first year, however, I realized that our conference could be modest and small, but its central issue was about becoming gigantic and see it grow throughout the years. I felt, for example, that the testimonials of distinguished journalists, who were coming to Austin to share their experiences in the innovative use of digital technologies, should be shared beyond the conference room as much as possible. That is why I started the video streaming even in a time that it was not so common, and when I knew that not many people had bandwidth to watch it. And that is why I have been posting the video and transcripts of each session on our website, since the very first symposium. One day, I received an email from a professor from Poland who ran into our archive and became ecstatic. He emailed me that felt as if he had discovered the *Eldorado* of research on digital journalism.

The ISOJ, however, was not born international, nor did it have a research component since its inception. Initially, it was focused only on the United States, attracting speakers from the main online journalism newsrooms in the country. Only in 2003 the SOJ became ISOJ, as we received the first speakers from abroad to share amazing experiences that surprised their American colleagues. The Digital Revolution is a global phenomenon, and to add an international dimension to the event was very natural for me, an immigrant who came from Brazil to the United States. But I am another kind of immigrant as well. I migrated from the newsroom in Rio de Janeiro to the classroom in Texas at a premier research university. So, in 2004, I added another dimension to the ISOJ: the research component. Refereed research papers had to pass a competitive blind review process and then be presented at the ISOJ.

Since 2004, the ISOJ became a unique conference that bridges what sometimes seem to be parallel worlds: the academic research on journalism and the professional practice of journalism. It has been fascinating for me every year to see researchers in direct dialogue with journalists and media executives. The result of this dialogue is often inspirational and profitable on both sides. The result of the research done for the ISOJ has been published on our website, along with the traditional transcripts, video and other material such as PowerPoint presentations. But there was still something missing in this evolution of the ISOJ.

A global conference like this, that has built an international reputation, that attracts researchers from all over the world, deserved a journal. That was the missing piece. And here it is. But this is not just a journal, it is a serious and rigorous journal with articles that passed a very competitive, international blind review process. It is more than that. This journal has been produced, in its inaugural edition, using the most advanced ebook technology. It can be read not only in paper and on the web, but also in book formats that works for mobile devices such as iPads, Kindle and other tablets, as well as on cell phones.

The #ISOJ journal , that incorporated the hashtag that made this conference well known in the Twitterverse, is another step ahead in the consolidation of this annual conference as a reputable gathering of scholars, journalists and media executives from around the world, But it is also an elevation to another status of a publication of serious contributions to scholarship in the field of journalism and communication, in an innovative digital format.

Introduction

By Amy Schmitz Weiss, Ph.D., Assistant Professor

San Diego State University

Welcome to the first inaugural issue of the #ISOJ journal.

This first edition features five articles that were presented at previous symposia. It is our great honor to launch this journal with an issue that captures a snapshot of research from 2006 to 2010.

The International Symposium on Online Journalism has documented the most unique and innovative aspects of the online journalism industry. For this reason, this journal seeks to maintain that same focus by selecting articles from past symposia that had unique and innovative approaches to investigating online journalism trends.

In addition, articles were selected based on their global representativeness. The journal will have an international scope by publishing research that investigates the trends happening in online journalism from across the world.

The first issue features studies that focus on the investigation of online newsrooms, the role of technology in times of disaster crisis, hypertext newswriting, mapping news websites and design guidelines for online news.

This inaugural edition hopes to document and answer questions we have about the innovations of the past while inspiring readers to ask questions about the future of the industry.

The journal seeks to continue the scholarly conversations about journalism in the 21st century that the International Symposium on Online Journalism has inspired.

Section 1

Setting Guidelines on How to Design the News Online. Portuguese Online Newspapers and their Spanish, Argentinian and Brazilian Counterparts

ORIGINAL ARTICLE - ISOJ 2009

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Over a decade has passed since the beginning of online journalism and online newspapers. Online newspapers have become large media engines with permanent accessible information. Their audience, in most cases, surpasses their printed versions by a reasonable margin. Having this amount of users accessing the news via the online newspaper version is a reality that could not be predicted ten years ago. Nevertheless there is not an established validation process on how should the news be presented to the users on this new media. There is still a lack of in-depth studies regarding the manner on which the various levels of information are presented to the users. As far as newspapers are concerned, this knowledge gap could be linked to the rapid evolution of the media and the technological changes that have occurred during this period. Thus, it becomes extremely difficult for the people involved, namely journalists, developers and designers, to establish which decisions would be considered appropriate when displaying the news online.

There are a large number of factors that must be taken into consideration when setting the design framework for an online newspaper. One example deals with the range of the new media. Whether the Internet will support general-interest journalism at a level comparable to newspapers or should the new media be more specific and engage on a multi-level platform that reaches the gigantic amount of users with whom they communicate?

Moreover we also have to consider the user's new interaction process. Nowadays regular users rapidly master ways of scanning information on those papers that didn't exist before, creating, evolved versions of interacting and new processes of information transmission, using the vast amount of technological possibilities made available.

The study was focused on identifying, after an evaluative analysis of the information architecture and design standards on online newspapers, a set of trends, concepts, technological changes, usability issues, users tendencies and responses, and how have they evolved during the last decade. During the last 14 years a series of evolutions took place. It is possible to name different stages of the design process towards online newspapers. Several authors (e.g. Gago, 2006; Salaverría, 2005; Salaverría & Sancho, 2007) have proven that the online newspaper as a genre has suffered a relevant number of changes until achieving its present form. A large number of those changes were technologically driven; some came from following the printed-paper metaphor and some from learning about their user habits. The medium has set news codes and still they cannot be considered steady in present time. Constantly the user is determining which codes are more efficient in any given platform or browser. In addition, it is an ever-working task for designers and journalists to fulfill the user's constant demand and also to optimize the features of this new, and not so explored, media. The status of the online newspaper is rapidly changing and the level of integration of online media possibilities, such as videos, sound archives or interactive graphics is increasing at proportion. There are still numerous fields of online design that have not evolved has expected. When constructing a website, there is only a very limited palette of typographical fonts available to the designer. Also the dimensions of the screen resolution and speed of file transfer are still quite limited. Taking this into consideration, it is yet appropriate to say that the manner that information is placed on an online newspaper, nowadays, is gradually improving and gaining common sense and logic yet still not embracing the medium as a totally different one. As Aaron Pilhofer, Editor of Interactive News technologies at The New York Times expressed "are we thinking about it enough. The answer is no. Are we starting to think about it? The answer is absolutely yes. Are we behind? Yes. Are we moving in the right direction? Also yes. Still we have a long way to go" (Pilhofer, personal communication, 2009).

Taking into consideration those restrictions, this study aims to present a set of guidelines that would help new media developers and designers to effectively display information on online newspapers. The analysis of the data collected during this last decade together with the evolution of online journalism, usability, developments on technology and information architecture, was used to establish the guidelines on how to design the news online while avoiding making common mistakes in the process. This also provided the basis for determining a set of examples that could illustrate the current status of online news design today in Portugal, Spain, Argentina and Brazil major online newspapers. Having determined and gathered these rules, the procedure continued with setting a comparative analysis of the results with a

sample of the main online newspapers in those countries. For that matter it was used the online version of Portugal's most widely sold newspaper - Jornal de Notícias (www.jn.pt) - and the country's most viewed online newspaper, publico.pt. The same approach was set for Spain with elpais.com and elmundo.es, Argentina with clarin.com and lanacion.com and Brazil with folha.uol.com.br and estadao.com.br. All the decisions and evaluations were made having in consideration the rules and the relation they could have with the current needs and specifications of the newspaper in question. This analysis did not intend to present an absolute model but rather provide a set of guidelines that would make the process of designing an online newspaper a clearer and more effective one.

There are three main reasons that determine the change or evolution of the design codes of online newspaper. Those being: technical constraints, purely business decisions or adoption of the printed-paper rules.

The level of design on online newspaper is steadily in an ever-changing mode. We can consider that in the present day it is still in between keeping the paper metaphor or going plain web.

User as role player

Right now there has to be an approach that understands the user as a main role player in the process. There are various items that are rapidly becoming default on online newspapers. Those being video, animated graphics, sound bytes, slide shows, interactive features that don't fit on any of those categories (measuring charts, useful tools for measuring taxes, income, percentages on buys, etc…).

The system on which these features sit, is still a product of the paper metaphor. The way that the single pieces of news are organized on screen is still similar to a moved-to-screen printed paper page. There is still, in a great majority of online newspapers pages, a paper based concept of where the news pieces should be positioned. This slows the flux of information and its possibilities. The media is different and the process of interacting with it is also very different. The New York Times started developing a series of "projects that aren't quite ready for prime time." One of the most visible and interesting is the Article Skimmer.

Described as "an attempt to provide that experience anytime. It is empowering to see so much information at once, so we display as many stories as we can fit into the space of your screen." (Little, 2009).

Concepts as information architecture, user interface, design and content should work together for an online version that is different from the printed product. Part of the problem is we still think, sometimes in an unconscious way, of the website as the printed paper online instead of its own medium. There are a various online-only features and an enormous amount of journalism done only for online. It is not a component or an enhancement of the printed product.

Some keys players in the business state "…we have start thinking of what we do as a technology company (New York Times) that produces content. A certain type of product and how it works on an online environment" (Pilhofer, 2009).

There is no more "the journalist is the speaker and the readers are those who are spoken to." Journalists and designers should embrace the fact that interaction is not acceptable.

People are coming to newspapers online because they still trust the media brand. Journalists, multimedia producers, designers and other role-players have to stop apologizing and start creating interesting, informative and engaging content. There is still a trust value on some of the traditional media that cannot be wasted while there's still a high demand for it.

Journalists, designers et. al, have to take the original report and all that data that they have acquired and make those available to the user by putting the tools to interact in the hands of those users.

Designing for the user

Users tend to interpret any salient graphical element as clickable. That presents a challenge to designers, who should avoid to decorate or fill white screen space.

When users think of their online newspapers, probably one of the last things that goes through their minds is design. Online newspapers are daily utilities, systems that provide information and entertainment. They need and should work in a very straightforward manner. It is crucial that design should be close to invisible and not necessarily look over-the-content pretty.

In text-dominated forms, the standards for hyperlinks are fairly and widely accepted: links are underlined or in a different color or both (Schumacher, 2005).

But, as far as interactive graphics, standards are still far from being set. In this path you still find links hidden behind

various elements. Those being buttons, legends, keys, shapes, areas or points on maps, words or complete sentences.

A growing number of designers try to set consistency by using similar codes for clickable areas and navigation systems standards. This is of great help to users, especially returning ones. This should not be taken as an error-free strategy. There is always an early phase where users explore interactive graphics experimenting in an extensive trial and tracking error activity.

Nowadays we have to deal with the possibility that people are going to use our interactives in different ways, that they might come to an inside page or interactive from the story it was linked to or maybe from a link from Google™ or even an email link.

Not only we have to design the page or interactive we have to be prepared to provide usability in the sense that people can work through the feature in an intelligent and understandable way across many different browsers and many different computers. There is, today, a fair level of controversy that emanates from not displaying identical design details in every browser, in particular Microsoft's Internet Explorer 6. Designers should not be obsessed to set “perfect” visual parity. The main aim is for news to arrive in a clear, well edited and engaging way. Standards of design and information architecture should be equally high and effective, but this should not mean that they have to be equal twins.

Designers should achieve to obtain the most out of the technical possibilities while embracing displayed content that will have non 100% identical look in different browsers yet maintains readability and functionality (Cederholm, 2009).

It has become very interesting. There is now, a vast amount of factors involved in it: the speed of broadband and broadband penetration, the speed of technology and its development. Devices such as Apple's iPhone™ provide results in terms of usability and interface design that seem to be setting a direction. The way the common user interacts with the iPhone is much different than anybody has interacted with computer screen interfaces for the most part beforehand. It became far more intuitive and the users engaged with it in a very easy way.

Interaction in the future will be, as Gabriel Dance, Senior Multimedia Producer for The New York Times, states "…much more organic in that way, much more intuitive in that way. But there's also the idea of a mouse whether you use a mouse with your hand and a keyboard or your finger in a glove becomes a mouse or just your eye becomes a mouse. The idea of a pointer will still be relevant, I think there are some things that are in place today, the idea of clicking, interacting, (…) how we do it, whether is visually in front of us whether is with our hand. the idea of pointing, clicking, hovering, I think those are relatively universal concepts that will probably remain" (Dance, personal communication, 2009).

To support even more this thesis: "In addition to the materials – information groups and links - the productions of a web news story should follow rules that are necessarily different from the ones used for the writing of printed news" (Canavilhas, 2008). By using a different media support from the printed press, web journalism must devise its own features or it will be doomed to failure (Pisani, 2001).

Thus, the web news develops through an architectural chain of information groups linked between them, accomplishing the latter two vital aims inherent to its documental and narrative functions (Salaverría, 2005).

Let users take full control of the interaction process. When using video, sound bytes, interactive graphics allow users to engage. Set clearly marked buttons to key actions. Buttons for start, stop and restart should be obvious and visible. When using online media, users are not in a lean-back position as when watching TV or listening to the radio. Interactivity and non-linearity are characteristics of Web-based media that users expect (Schumacher, 2005).

Allowing users to have control over their own interaction requires a navigation system that permits guidance within the page. Features such as "home", "play" or "back" buttons should be clearly marked. Remember the basics of design: you are designing for a purpose. In the case of online newspapers, the purpose is to allow the user the easiest and more engaging way to access content. Designers are now designing more than a product, they must design the use of that product.

There is a very back to basics and nowadays symbolic question designers should ask every time when they lose site of their purpose online: what are the five spots on the screen that are easiest to point to with the mouse? The answer: all four corners of the screen (where you can literally slam the mouse over there in one fell swoop without any pointing at all), plus, the current position of the mouse, because it is already there. (Spolsky, 2000). Make it engaging, informative and their tools easy to use.

Analysis of the two major daily papers in Portugal, Spain, Argentina and Brazil

As said before, typography or the lack of choices in that field is still an issue when designing online news. The

approach, in the meantime, should be to obtain the most out of the available families. Again it is a more back to basics approach, kind is less important than size or color. So, do you want people to read, not scan?

Consider small type (Outing & Ruel, 2004). This doesn't mean that the use of small type determines a higher reading rate or attention from the user. It implies that there is a need for a balance between big typography and small typographic sizes when designing online newspapers, that some features are meant to be scanned and some to be read with more time and attention.

The Eyetrack III study, done in 2004, brought up some interesting conclusions: "…researchers discovered something important when testing headline and type size on homepages: Smaller type encourages focused viewing behavior (that is, reading the words), while larger type promotes lighter scanning. In general, our testing found that people spent more time focused on small type than large type. Larger type resulted in more scanning of the page -- fewer words overall were fixated on -- as people looked around for words or phrases that captured their attention."

Some extra tests done in 2007 proved that online readers divide their level of attention when reading in a very even manner, spending half of their time scanning and the other half reading methodically (Ruel & Paul, 2007).

Some other key features of online newspapers design (beside the above mentioned buttons) are also interesting. One distinctive and fundamental is the main menu bar or bars. In all cases analyzed it evolved from the initial vertical-left-column menu to a clear horizontal one. The initial use of the vertical menu is normally attributed to technical constrains and the use of separate areas on the page common in the early software. another problem was that before webpages were not wide enough to fit all the menu options in visible type size. With the improvement of the screens and the commonly adoption of the 1024 wide screen, space stopped being a concern and the horizontal menu became, in the vast majority of cases, a standard (the nytimes.com still uses both menus for different levels of features and sections). This position of the menu seems to make much more sense this way. First because the screen his set also horizontally allowing a easier flow of the navigation, it also allows more room for a second menu bar or one with a drop out extra menu. This design decision also means that the news start all the way from the beginning of the screen limit with no noise or distracting factors. Another differentiating feature is the use of embed videos or animated graphics in the news and not only on "Multimedia" or "Video" features. Publico.pt, Folha.com.br and Estadao.com.br have determined areas for videos on their homepages; lanacion.com also does but uses then freely the news grid spaces. Clarin.com, elpais.com, elmundo.es and jn.pt use them as a regular feature in the regular news grid. These last four also apply the same criteria to photographs and, when suited, animated graphics, using all these elements as an aid to the written text or as news.

The column size is similar in folha.com.br, estadao.com.br and publico.pt, although folha divides the main left column in two uneven columns on it's upper level (being the smallest one the one set on the left side and used to display small news titles). Jn.pt is the only one of this group of eight that has interchangeable columns that allow position change depending on the kind of news they display. Elpais.com, elmundo.es and jn.pt all use the length of their main columns as a single one when the dealing with breaking news of some impact (as seen in the elpais.com capture).

The use of images is common in all of the eight newspapers analyzed but some extract the best out of the platform possibilities and others are still very limited in that sense. In this terms jn.pt, elpais.com, elmundo.es allow a more than a column wide use of photography, increasing by so, the impact of that media on the page. all those 3 encourage the use of slideshows, being that elpais.com has even a different look and feel page designed for that purpose. When looking at pictures online, users look more to real people with accessible faces. (Ruel & Paul, 2007).

The system

Using and adapting a version of Andrew Devigal's "Design Guidelines for Online Sites" and Jacob Nielsen's "Ten Usability Heuristics" (Devigal, 2001), we created a set of guidelines that can be simply used to help test online newspapers sites.

Determine the goal for the site

Is the site news related? If so, what do you want to give and how do you want to give it to your users? In a single word: Focus.

Identify your audience

Assumptions: Is your audience is educated, informed, relatively well off, curious, impatient, busy, task oriented, use the web for research? Run surveys and keep yourself updated to clicks and users feedback. Use technical statistics from the server to determine frequency of visits, frequency of unique visits, time of visits, where the site was linked from, where they go in your site, where they don’t. Try to evolve from those results. Try new features and always remember to make

then engaging and easy to use.

Match between system and the real world

The system should speak the users' language, with words, phrases and concepts familiar to the user, rather than over technical terms. Follow real-world conventions, making information appear in a natural and logical order.

User control and freedom

Users often choose system functions by mistake or previous-use-instinct and will need a clearly marked "emergency exit" to go back. Support "home" and "back" buttons.

Keep the color for linking consistent with graphics and hypertext.

Design for the lowest common denominator (currently on online newspapers that can be set at 1024 x 640 monitor size, and cable or ads speed of bandwidth).

Consistency and standards

Use language familiar to your user. Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow mainstream and specially your own web established conventions (Facebook's ever changing interface is an example of how to disrupt the use).

Instructions for use of the system should be visible or easily retrievable whenever appropriate. Use big buttons and clear options

Flexibility and efficiency of use

Design the interaction in a way that allows that system can cater to both inexperienced and experienced users. Allow users to play around and tailor frequent actions.

Don’t use technology that isn’t widely used.

Create a hierarchy based on the site’s strengths

Human tendency is to categorize, so categorize sections logically.

Minimize the number of sections to no more than 6 or 7, or re-evaluate the categories. Use contrast. Screens work in a different way. They are not paper. Contrast of size and color helps determine hierarchy as well as the focus of information. Contrast of type helps determine the voice for the information.

Design with an emphasis on usability

Accept the fact that most users surf the Internet newspapers for research: a piece of news, a movie show time, a concert date and ticket availability, or the latest sports score.

Make information easy to find and logic to link. don't create barriers to the information flux by cluttering the elements. Establish visual and interactive consistency with site’s brand. If the user trusts the brand, it should be visible and present via Logo and look-and-feel. Develop a solid style book that can change as the technology changes. Don't make it technologic irrelevant after six months of use. That's how fast things change.

Although all the sites analyzed still hold a lot of the printed paper procedures, there are some that are engaging more effectively with their audience.

Jornal de Notícias, Portugal. url: jn.pt

It uses a clear and solid typographical choice and a distinctive color code. There's a simple and effective hierarchy on the levels of importance of the news done by type size and style (serif for titles and sans serif for text) and place on the page.

Its upper double level menu allows a fair number of sections to be consulted although in some situations with the printed newspaper's logo might result visually heavy.

Videos and Interactive graphics are used as common text based news when found suitable. It uses an interchangeable column system that allows another level of flexibility when dealing with different kinds of news (e.g.: very "visual" video as opposed to breaking news with no more than a text description). The third column (far right) has almost always non-editorial content. That option sometimes gives the feeling that it is only an advertising part of the screen, setting users eyes away. A mixed system could have better results. Although present on the home and along the website, multimedia content should be visually more engaging and consistent with the site's look and feel. The downturn of having a great number of multimedia features done by a small team is that some usability procedures and details are repeated along most of its production.

Overall it is a good newspaper site that deals very consistently with an enormous news flux but it should try to integrate the rest of its content and improve its interactive features usability standards.

Público, Portugal. url: publico.pt

It has a double upper menu with bold and non bold type, using the same typeface. Above the menus is the printed newspaper's logo, two special features of news and one advertising block. It uses a three equal column model. Left column is for videos and pictures in the upper level. Under those there is the quote of the day , the stock market values, forums and blogs menus. On the central news column it uses a clear and solid typographical choice (serif for titles and sans serif for text) and almost no color code, one being used for news with no pictures with two kinds of levels in terms of type size: main article and the others. There is not a common use of pictures in this column. Right column is used mainly for advertising and lists of the latest news. The use of three similar columns limits the medium possibilities, restraining the multimedia to a block and the text based news to another one. The absence of color codes makes it hard for the user to identify different features. In this case the lack of color codes impact can be considered has not so strong due the above mentioned confinement of contents to a single column. Overall, the top accessed Portuguese newspaper still holds back a lot of the information, playing a conservative strategy in terms of information display and use of multimedia features. It's a solid wireframe but a very limited one. It would benefit from using a basic color code and more engaging and flexible structure.

El País, Spain. url: elpais.com

It makes a very good use of the screen space. All the three columns can be used as news displays. Using the words of Rafa Hohr its former Graphics Director "the website works as a window shop where fluxes of all kinds of news are shown during the day" (Hohr, personal communication, 2006). It has a wide use of photography, videos and some animated graphics in all the three columns, sometimes using the those same three columns all at once for one photo. This says a lot about the flexibility of the design wireframe.

It uses a different layout for the slide shows, adopting a black background, which makes the user to focus only in the pictures. Clear use of type (serif for titles and sans serif for text) and mid tone color code allows a subtle content differentiation over the dominant white background. This online newspaper adopts a slightly different logo from the printed paper assuming its own character. It has an enormous amount of multimedia content derived from the group's diverse media range. Television feeds and radio sound bytes are normally displayed on the paper's website. Advertising shows above the whole page at 1024 pixels and in the right column. Overall, this papers presents a common use of integrated multimedia features, great animated graphics and solid slideshows. It uses a solid and flexible wireframe although its use is sometimes too inspired by the printed paper making the paper feel cluttered and overflowed with information. It should also make the lower part of the page more engaging.

El Mundo, Spain. url: elmundo.es

The top online newspaper in Spanish redesigned not long ago. It maintained the structure and refined the details. The use of a single sans serif taste works dynamically due to a balance system with different sizes and colors that match the different levels of importance given to the text. It allows the user to engage in some multimedia features, mainly video and their award-winning animated graphics. The wireframe sets three columns although only the left and central one display text based news. Right column is used on its upper side as a photo and video display, advertising, services and stock information. They have a different logo and a different color from their printed version but still they keep the brand feeling as they use the same name and display the two logos together. Very solid and small color code. A different color set for titles, main text and subtitles making their use basic, simple and easy to use. Uses several special edition blocks (national and regional elections, government members nominations) that have interactive features and make use of all the width of the screen. Overall this online newspaper has a very good interactive level but still needs to improve its model of usability. Some strong features like the animated graphics and the special blocks are designed accordingly to the new medium but a major part of the structure is still inspired in the printed paper. This might be due to a very recent integration of the two, once separated, newsrooms.

Estado de S. Paulo, Brazil. url: estadao.com.br

One of the historic printed newspapers from the country uses a six column grid that is used freely on all the different

vertical levels of the page. On the upper part it can be two+[two(picture)]+one+one (advertising) and in the next level is two (advertising)+one+one+one+one (advertising). The top upper level has a advertising banner with 1024 pixels and there's three levels of menus, separated by weather and stock market information. All this factors combined make the user experience somehow confusing. Too much information, too many type sizes, type styles and colors all in the same place. The advertising on the upper part of the side also has three blinking animated banners that together with a self promotion feature, set 30 pixels lower do not add to the usability of the page. It keeps the name (a strong and solid brand in Brazil) but uses a totally different logo. There a lot of advertising banners all around the page and an enormous amount of information set in a very cluttered space. The news blocks are small and somehow harder than usual to read. Besides an animated slide show on the upper side of the page there is no strong interactive displays for people to engage. Overall this page seems to be losing its goal of informing and interacting with the audience. There's some interesting data displayed, but the manner that is done makes it hard for the user to interact or sometimes read. There is a very high number of advertising banners that deflect the users attention and make the process of consulting the page a difficult one.

Folha de S. Paulo, Brazil. url: folha.com.br

The other of the historic printed newspapers from the country and the continent uses a three column grid where only the left and central ones are used for news. The right one is for advertising, services and search. On the upper left part of the page, the left column divides in two uneven ones, working the smallest one as a display for short non hard news and the other one as an animated slide show of the latest news. The same typeface is used in all the main features of the page. Color variation is minimal and the different tones of blue and black can become misleading to some older users. They use their one logo although it is similar to the printed paper with the addition of the word "Online". Next to it there is an opinion editorial link and a self promotion feature The upper side bar has also three levels of menus, being the first one for features outside the website and the other to navigate inside it. There can be as much as 25 different menu options presented at the same time, which is not a helping factor for the user. There is an animated "on the hour" feature that has play/pause and forward/backward options and an occasional sound byte display. All this features make this upper area very confusing. It seems like the wireframe of the page was bended innumerous times to fit the vast amount of content that displays. In its lower levels there is a podcast section yet still the multimedia and interactive levels seem to be one of the features to improve. Overall this site has a lot of potentially good data that needs to be edited and shown in a much more clear, spacious and engaging way.

La Nación, Argentina. url: lanacion.com.ar

One of the two major newspapers of the country La Nación redesigned recently its webpage version. The upper part is clear and white space prevails. It has two different levels of menus, both with no more eight features and displayed in a very clean and visible way. There's the web's logo personalized but still reporting to the paper one, information about the weather and a animated advertising banner. Its wireframe its divided in three columns being the right one used for

updated news list and advertising. The two news column use the same sans serif typeface in different sizes, styles and colors, which in some moments can become more confusing than useful. there seems to be a large set of news hierarchy. Some of the news blocks display and very informative detail: for how long they have been online or last updated. There's a animated slide show on the central column that displays the editor's choice of the latest or more important news.

Overall, the page has a clear look and feel but it doesn't invite the user to engage with it in an easy manner. There are none or very few interactive or multimedia features and the size of pictures (compared to the advertising banners, per example) are not to generous.

Some features on the lower levels of the page are set in very small type sizes which added to their location doesn't help the reading.

Clarín, Argentina. url: clarin.com

The major printed newspaper of the continent has a particular website. The recently integrated newsroom produces a very integrated page.

The upper level of the site has three sets of menus of very easy use, a Google powered search box, day, time and weather information and a traffic live update. All these elements are organized and set in the same typeface.

The wireframe is divided in three columns. The right one being used for advertising and special features and the remaining two for news. They use a very small color code and two kinds of typefaces (a serif and a sans serif) with little size and style variations. The feature that distinctly sets clarin.com from most of its counterparts is that the order of the news feeds is determined by time. The most recent comes on top. Of course an update of an interesting news story its considered as "most recent" also. Yet this option is a distinct editorial choice that is reflected the way the news are displayed.

Clarin also has a strong multimedia presence. Taking advantage of being part of a big media group, the website uses and edits feeds from TV stations, radios and also produces their own. They have been using videos, pictures and sound bytes together with text-based news or as a news piece.

Overall it is a good multimedia engaging page (if we discount the almost non existent use of animated graphics), set on a classical wireframe that limits its potential. Even so it has a clear navigation and is able to display a great amount of information without making it look cluttered.

Conclusions

There are some very positive aspects on all this sites except the major ones from Brazil, that still have a fair way to go, in terms of design framework and interactivity until they make use of the medium's full potential.

There is a tendency to use the left column as advertising display and only a few could provide a good balance between type style and size. There is still a lot to test with color codes and the use of photography is yet to be explored in more than half of the pages analyzed. Video and animated graphics are only default in a minority of the sites analyzed and multimedia in general is not yet a clear concept.

There seems to be an great need of an information architect that would help organize and define the best way to present the various fluxes and shapes of information so that it can most easily and effectively be consumed by the user.

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Section 2

Citizen Journalism, Citizen Activism, and Technology: Positioning Technology as a 'Second Superpower' in Times of Disasters and Terrorism

ORIGINAL ARTICLE - ISOJ 2006

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This paper presents a qualitative assessment of citizen journalism and activism efforts through the times of the 2004 Indian Ocean Earthquake, the 2005 London Underground and Bus Bombings, and the 2005 US Hurricane Katrina disaster in an effort to examine how the technology industry and the associated industry of journalism is being affected by a new ethic in production and dissemination. This ethic, which welcomes the involvement of amateurs, hackers, gift-givers, and the non-elite community, has created a plethora of open source tools for blogging, wiki development, mobile phone Web publishing, and Internet telephony. These tools were vital to the formation of global citizen journalism and activism initiatives, allowing bottom-up and emergent disaster management support systems to arise from distributed and decentralized global efforts. The immediacy and widespread availability of these tools allowed citizens to function as unintentional, accidental, and incidental journalists, providing first-hand reports when the mainstream media were absent. Citizens stepped forward to lead and develop open source tools to aid missing persons and disaster recovery efforts. A critical assessment of these technologies in terms of access and usage is provided as it relates to participatory journalism, mainstream journalism practice, and global disaster and terrorism initiatives.

Citizen Journalism is the latest buzz word to describe a global publishing phenomenon that began as an amateur pursuit but which now has increased fragmentation of the mass media's once passive consumer audience. Fueled by the open source revolution, both technologically and philosophically, citizen journalism was identified as one of the chief threats to a dismantling of media hegemony and mass media power by the most recent State of News Media report (Project for Excellence in Journalism, 2005). The deep-seated fear of an empowered audience by industry executives accustomed to owning the tools of media production and dissemination has led to media skepticism, outright hostility, and slow acceptance of powerful amateur publishing trends that are likely to outlast their current memes and forms.

It is widely considered that the chief trigger event for the growth of the American blogosphere was the September 11, 2001, terrorist attacks in New York City. In commenting on the impact of 9/11 on the phenomenon of blogging, widely-read conservative blogger and University of Tennessee Law Professor Glenn Reynolds (2005) highlighted that "the blogosphere traditionally rallies in crisis." Though blogging was gaining popularity since 1999 due to the early release of such popular open-source blogging toolkits such as Blogger, Groksoup, and Edit this Page (Blood, 2003), its audience was still confined to a technical savvy group or to early adopters to the technology before 2001. Media consultant, blogger, and director of the New Media program at City College of New York Jeff Jarvis (2005) noted that blogging as platform for public opinion gained critical mass and dissemination in the aftermath of the 9/11 terrorist attacks, giving rise to the term "war-blogging" or "war-blogger" as vivid descriptor for blogging in a post war environment. The post 9/11 climate of shared public voice collided with the development of new blogging technological platforms creating a fertile environment for blogging to gain mass appeal. Many blogging tools were free and available to anyone with an Internet connection. Currently, blogging is growing, both in activity (Sifry, 2005) and in readership (Pew Internet Report, 2005). The growth of the blogosphere as a heartfelt response to tragedy has continued to gain momentum with subsequent disasters and terrorist acts—the subject of this current paper.

To fully understand this powerful amateur publishing trend, it is important to connect the growth of free creative expression to the open source software movement—a movement referring to software projects that release their source code for free via flexible licensing. Open source development, typically using the Linux, Apache, mySQL, and PHP/Python/Perl development framework, has provided a competitive business threat to preexisting forms of elite technology development. Microsoft's Chief Executive Steve Ballmer once called Linux, an open source operating system, "a cancer" to the world of software engineering because of its undervaluing of technical talent through provision of free source code (LaMonica, 2005). The difficulty for traditional mass media outlets to maintain its hegemony over the public has been accentuated by open source blogging platforms. Additionally, the rapid growth of mobile communications industry, which empowers citizens to record audio, take video and pictures, and write blog entries from their cell phones and PDAs, has accentuated the mass media's loss of hegemony.

This paper presents a qualitative assessment of citizen journalism and activism through the times of the 2004 Indian

Ocean Earthquake, the 2005 London Underground and Bus Bombings, and the 2005 US Hurricane Katrina disaster in an effort to examine how the technology industry and the associated industry of journalism is being affected by a new ethic in technological development. This ethic, expressed in the direct shaping of technology, encourages the donation of free talent, the inclusion of amateur involvement, and the gift-giving of talented hackers and experts to the self-empowerment of citizens. Using science studies theories to frame the disruptive effects of empowering technologies and open source technologies, this paper will examine the actual usage and shaping of technologies as tools for empowering citizens to tell their own stories, create media, and develop community-based tools for citizen mobilization and empowerment outside government and Big Media in times of disasters and crisis.

On a more theoretical note, this paper engages in a critical assessment of the technical advantages laid out by open source advocates and technology enthusiasts as it relates to disaster and terrorism contexts. This paper poses the big question: can technology be positioned by socially minded technologists to work, in the words of Moore (2005), as a "second superpower" in times of disasters and crisis? How can open source software solutions, working in conjunction with existent technological infrastructures, harness the emergent intelligence and wisdom of communities to enable citizen involvement in framing responses to disaster management? How can technology be creatively used to empower citizens to self-organize outside the auspices of government and Big Media in times of disasters and terrorism? Does everyone have access to these technologies in vulnerable times?

Through examining and analyzing citizen blogs for accounts of citizen journalism, citizen activism, and technology development and use during the times of the 2004 Indian Ocean Earthquake, the 2005 London Bombings, and the 2005 US Katrina Hurricane disaster, this paper assesses the complex relationship between citizens, journalism, and technology in the more recent instances of disasters and terrorism.

Literature Review

Understanding the momentum for open source technological development and shared modalities of production as an alternative to price-based, market value determination is best aided by the appeal to science studies and to the historical intersection among the variables of science, technology, capitalism, control, and power. Though there are some scholars that believe in technological determinism or a technology-led theory of social change, a fair amount of science studies theorists espouse the significance of examining the social factors that shape the choice, development, deployment, and usage of technology through looking at both the stakeholders (insiders) and those denied access (the outsiders). The line dividing these theorists is not exact, though Smith (1994) identified Lewis Mumford, Jacques Ellul, and Langdon Winner as technological determinists in as much as they view technology as a key component of social change. Though Winner has been tagged as a technological determinist, he identified the problem of modern technics not only in technological determinism but in the inherent threats of technical choice in its selected design and arrangement. Winner's exhortation for moral and political principles as guides to technology choices was an attempt to choose "technical regimes compatible with freedom, social justice, and other key political ends… so that institutions would develop in which the claims of technical expertise and those of a democratic citizenry would regularly meet face to face" (Smith, 1994). The ability to shape a technology is also impacted by when one enters in the development process. Hughes (1987) noted that systems, which have developed momentum or maturity, appear to be tools of technological determinism because they function more as shapers of society due to closure, stabilization, and the technology's role as an infrastructural base for other emerging technologies. Hughes highlighted that the best chance for shaping a technology exists in the early stages when the technology is being negotiated among competing social groups. Referring to the infrastructure of the Internet, Star and Bowker (2002) noted that new media infrastructure, once settled, becomes invisible, and provides an installed base for future developments.

Theorists who decry technological determinism in their exploration of the social forces impacting on the choice, development, and deployment of technology have shown the evolution of technology to be derived from the interrelationships among social variables, often intersecting with science, productivity, progress, capitalism, power, and control. Their focus on the social groups that shape a technology's development and deployment has given historical context and visibility to the forces that have shaped a technology's outcome, issues that often get forgotten when a technology becomes invisible or widely diffused. The opportunistic service of science to capitalism was clear in the ideas of Scientific Management and Taylorism, finding later expression in the Fordism automated assembly line. Through Scientific Management, the application of scientific principles to factory control management methods was devised to organize and control labor through the divorce of the task from the brain (Braverman, 1974). Management dictated to the worker the precise manner in which work was to be performed, robbing the worker of any decision making potential, ideas, imagination, or craft, all in an effort to squeeze as much productivity from the worker as possible. The destruction of the importance of tinkering and self-discovery through amateur exploration was essential to the capitalist period in which the worker was robbed of all control or brainpower over the direction of production. Fordism, whose relative or internal mobilization regimen is described by Robins and Webster (1999) as "a megamachine that paced and disciplined the workforce," enabled capitalism to thrive and consumerism to flourish as demand increased to keep pace with the ever increasing supply bolstered through mind-deadening automated assembly line work. Robins and Webster

reframed Luddism through a resistance or protest lens in sharp contrast to its commonplace derogatory definition as the ignorant hopelessly fighting technical progress. The luddists were dissenters fighting against the inherent destruction of a way of life by industrial capitalism, control, and a negative social reorganization that robbed them of freedom and values. The revival of neo-luddism as a form of resistance in 20th century America has at its core the notion that there is more than one way to resist the tyranny and oppression of technology outside outright rejection of technology.

The growth of the mass media publishing machine in the US was part and parcel of the existing technological infrastructure that cultivated monopolization, concentration, and standardization, beginning with the telegraph. Starr (2004) charted the development of media technologies, citing the press as an important source of the start-up capital and early demand for the telegraph. Carey (1992) noted the importance of the telegraph in freeing communications from geography. The resultant impact was the need for an objective, standardized, and packaged news commodity that could be transmitted by wire services to be consumed through news space. The trend of media conglomeration, begun centuries ago, is still pervasive in current mainstream media industry. Project for Excellence in Journalism (2005) noted that though conglomeration slowed down for all of the major mass media in the year 2005, but is still at an all time high. Currently, two-dozen newspapers industries continue to dominate the market both in terms of the numbers of newspapers they own as well as their percentage of the total daily and Sunday circulations. Network TV news is dominated by General Electric, Walt Disney Company, and Viacom. For all three corporations, news is a small percentage of the offerings and revenue earnings. There are three major cable news operations owned by Time Warner, News Corp. and General Electric. Similarly, radio also has a top-heavy ownership pyramid, with Clear Channel Communications dominating the radio market over its next closest rival, Cumulus Broadcasting. Project for Excellence in Journalism noted that the Internet is the only medium that approximates ownership by the people, permitting a vibrant publishing environment outside the controlling influence of the top online news players.

Similar to earlier technologies, the Internet was seized upon by technological enthusiasts as a device that would bring freedom and democracy. Like technological determinists, utopian enthusiasts seized upon the Internet's unique qualities of interactivity and two-way communication as a signal that democracy would be improved and civic engagement revitalized. Hacker and Dijk (2000) defined digital democracy as "a collection of attempts to practice democracy without the limits of time, space, and other physical conditions, using ICT's [information and communication technologies] or CMC [computer-mediated communication] instead, as an addition, not a replacement for traditional 'analogue' political practices." Unique qualities of the Internet instill hope in its ability to increase the scale and speed of providing information, make political participation easier, allow new political communities to arise free from state intervention, enable citizens to insert their voice, help remove the distorting mediators, and help solve the problems of representative government (Hacker and Dijk (2000). Hagen (2000) cited that digital democracy is meant to solve the problems of the crisis in political participation and the seeming dysfunctional role of the mass media in the political process. Lee and Frankel (1999) agreed that Internet is suitable for communications because it has low barriers to entry, provides many-to-many communications, is delivered quickly at low cost, and enables decentralized organizing. With the advent of new technologies, some theorists have advocated direct democracy as a viable alternative to governance (Barber, 1984; Budge, 1996; Grossman, 1995) as opposed to representative government.

However, there was no automatic guarantee that the Internet would improve democracy through expanding usage to the common people. As an initial tool of the military and defense, Edwards (1996) highlighted that the Internet was first developed under a command-and-control communications architecture. Before 1991, the lack of a friendly graphical user interface left the Internet in the hands of experts—engineers, programmers, scientists, and academics, who dictated its development. It is during the 1980s before the development of the World Wide Web that the free software revolution, inspired by the MIT researcher Richard Stallman, was initially started as a protest movement against the black boxing of computer software code, commonly called source code. Opposing the commercial and capitalist impulse to market and profit from software development through keeping the source code invisible to tinkering, Stallman's notion of offering free software through public release of the source code under the General Public License was part and parcel of his stance on the natural rights to which individuals are entitled, popularized by the slogan "free as in speech, not as in beer".

It was in the late 1990s after the development of the World Wide Web and HTML by Tim Berners Lee that an alternative movement, the open source movement, would gain legs, bolstered by the earlier development of Linux in 1991 by Linus Torvalds (Torvalds, 1999). The open source movement shared some of the similar principles of the free software movement, with the exception that it was designed to be friendlier to business interests through more flexible licensing. Aware that Stallman's innate freedom maxim was off-putting to business and commercial interests, the open source movement sold its philosophy through language designed to pose less of a threat to the commercial business models of software engineering. This more congenial language did not prevent monopoly giants such as Microsoft from trying to demonize open source development as an unfair market practice that devalued the worth of the programmer and encouraged stealing of source code without pay.

However, though open source was designed to provide less of a business threat through adopting licensing that allowed

for the mixture of proprietary code and open source code, its fundamental principles and its close association with the free software movement has unleashed a post 1990s market principle of software development that is designed to be less monolithic and more bottom-up as opposed to top-down and hierarchical. This new spirit of collaboration and generosity finds expression in such terms as the gift economy, peer-to-peer development, bazaar design, and the hacker ethic. This new proposed model of social sharing, exchange, and cooperation in technological development stands as a new modality of production (Benkler, 2004; Saveri, Rheingold, and Vian, 2005) that is not price-based, firm-based or state-based. This form of social sharing system gained expression in Raymond's (1997) coining of the "bazaar" form of software development as opposed to a "cathedral" style of top-down management. The new measure of wealth is now conceived in the development of networks and the fostering of conversations that reap benefits larger than the sum of each individual person (Reed, 1999). Leadbeater and Miller (2004) describe this pro-amateur revolution as a "new distributed organizational model(s) that will be innovative, adaptive, and low cost." Current successes in open source development include Linux, an open source operating system, Wikipedia, an open source encyclopedia, Apache, an http server, and Firefox, an open source web browser. Current popular blogging applications that power this new trend in amateur or citizen publishing are all built on the open source platform LAMP (Linux, Apache, mySQL, and PHP/Perl/Python). The trend of Web publishing by amateurs has become so aligned with the open source revolution, that this particular form of journalism has often been tagged, "open-source journalism." The disassociation with the term open source from strictly code to stand for transparency and collaboration through community has enabled the spreading of the open source meme to describe systems that encourage heterogeneous actors to be incorporated in the network. This openness to amateur contributions is in direct contrast to more formal systems of production.

These ideals of increased democracy and freedom concomitant with the open source tag are the backbone behind several theoretical concepts that are associated with open standards in technology. According to Joi Ito (2003), it is important to use the tools and technologies currently under development to further democracy, allowing for the growth of a "functional, more direct democratic system which can effectively manage complex issues." Using the concept of emergence to describe the growth of a complex system through the collective actions of simple parts of a system, Ito sees the promise of technology in its ability to enable citizens to better "self organize to deliberate on, and to address, complex issues democratically, without one citizen required to know and comprehend the whole." Ito lauded the importance of tools developed in open communication spectrums to enable access to all people through transparent architecture. Aligning with the emergent democracy concept, Moore (1993) related the Internet and technologies that create global web-enabled initiatives, to a second superpower, where deliberation "is done by each individual—making sense of events, communicating with others, and deciding whether and how to join in community actions." The second superpower is distributed and bottom-up in organization, flexible and agile in response to outside events, and responsive to the individual wisdom of each person.

This paper examines blogs for evidence of how technology was both shaped and used by ordinary citizens, technologists, and global activists to provide avenues for citizen journalism, citizen activism, open-source software solutions, relief, aid, and an environment for self-organization, mobilization, and storytelling. Since 1999, blogging platforms have inspired an increase in the development of technologies that enable citizens to publish outside the auspices of traditional media newsrooms. In addition to citizen blogs, this paper also relies on the accounts of mainstream media—newspapers, television, radio—for analysis of how technology was creatively used by citizens to self empower. Finally, this paper examines the open source technological development strategies used during these times of disasters and terrorism as a tangible citizen response to self-mobilization, both locally and globally, in order to assess its strengths and weaknesses during these vulnerable times.

Disasters, Terrorism, and 'Open Source' Journalism

All of the three incidents examined in this paper were identified as critical junctures for both citizen journalism and technology development by Big Media newsrooms and organizations. The December 26, 2004, Indian Ocean Earthquake, which triggered Tsunamis affecting such areas in Southeast Asia and Africa as Thailand, Indonesia, Malaysia, Sri Lanka, the Maldives, Somalia, India, and Burma, was estimated to cause over 175,000 deaths, with the count yet incomplete. As a highly emotional and compelling incident, several tourists became "accidental" "incidental" or "unintentional" citizen journalists, due to being armed with camera-equipped cell phones and digital camcorders. Steve Outing, senior editor of the Poynter Institute, referred to the incident as the "tipping point in citizen journalism" and as the "seminal marker for introducing citizen journalism in the hallowed space that is professional journalism."[1] John Schwartz of the New York Times noted that "For vivid reporting from the enormous zone of the tsunami disaster, it was hard to beat the blogs" as "technology provided the ready medium for instant news." Commenting on the role of technology in relief, reconstruction, and software development, University of Tennessee Law Professor and Blogger Glenn Reynolds, blogging for MSNBC noted that "the self organizing character of the blogosphere has allowed for rapid response as people who want to help have been put together with ways to help." Interviewed by NPR, Xeni Jardin, blogger for the highly popular blog Boing Boing, stated that she received numerous text messages, photos sent via cell phones, and first person accounts suggesting, "a completely new kind of cultural phenomenon" in the way that

technology and blogs can be created and used to aid individuals in framing response management independently of Big Media and government.[2]

The July 7, 2005, London bombings, highlighting the creative use of mobile and blogging technology by citizens to tell their own stories, was identified as a turning point for news-gathering and news production by many mainstream media (MSM) outlets in the UK. Helen Boaden, BBC director of news, was cited in the Financial Times as saying that “the gap between the professional and non-professional news gatherers is getting narrower.” Interviewed by Financial Times, Simon Bucks, associate editor of Sky News, identified the moment as “a democratization of news coverage” (Burt, 2005), as it was evident that the story was already covered by the plethora of citizen journalists before Big Media crews arrived on the scene. Many Big Media newsrooms led their television broadcasts and print editions with material captured by citizen journalists, signaling what the widespread acknowledgement of the citizen as a valued source in times of terrorist attacks. According to the British Guardian (2005), “Mobile phone video clips and stills were posted on the Internet sites alongside first-hand accounts of people’s experiences, building up a vast catalogue of DIY coverage more comprehensive and wide-ranging than anything available through the mainstream media.”

When hurricane Katrina hit the US, both media and citizen journalism bloggers were not caught unprepared like the previous cited incidents. According to Mark Glaser of the Online Journalism Review (2005), “the watershed for online journalism has been laid bare. Hurricane Katrina brought forth a mature, multi-layered online response that built on a sense of community after 9/11, the amateur video of the Southeast Asian Tsunami disaster and the July 7 London bombings.”[3] Like the two previous incidents, the US Katrina Hurricane disaster, which affected mostly the southern areas of New Orleans, Louisiana, Mississippi, and Alabama, wreaked havoc in terms of causing over 1,300 deaths, displacing many of the residents of the New Orleans city to neighboring states. Residents who remained trapped were mostly the poor black population, confounding the significance of the tragedy as the country assessed its racial and class divides when help was slow in coming to these people. These divides were also manifested in the access to technology. The dangers of a broken telecommunications infrastructure was all to evident in the stories of exaggerated criminal behavior and surreal rumors in the overcrowded Superdome and Convention center where these trapped residents were given shelter.

Yet, for the more affluent with an Internet connection, the atmosphere was ripe for citizen journalism to provide vivid, raw, and unrelenting critical detail of the slow response of Washington politicians in responding to the disaster. Additionally, MSM media such as CNN, MSNBC, The New York Times, the Washington Post and the BBC, all openly advertised for citizen journalism content on their news’ home pages.[4] Some questioned the sincerity of the Big Media’s call for citizen contributions through their creation of visual demarcations between citizen and professional contributions.[5] Yet, as the Web was tuned into a massive bulletin board of missing person’s registries held on public and private Web site domains, both amateur and professional journalism was viewed in a complementary as opposed to oppositional relationship. According to Mitch Gelman, executive vice president of CNN.com, “Traditional journalism is on the outside looking in…..Citizen journalism is in the inside looking out. In order to get the complete story, it helps to have both points of views” (Gonzales, 2005).

Mobile Technologies

Any discussion of the role of mobile technologies in documenting disasters and terrorism invokes Rheingold’s (2003) coinage of the term smart mob to refer to the coordinated political acts of a technology-empowered mobile communications crowd.[6] When interviewed by John Schwartz (2004) of the New York Times, Rheingold commented on the use of interactive technologies like text messaging that, “If you can smartmob a political demonstration, an election or urban performance art, you can smartmob disaster relief.”

It is important to note that cell phones have functioned as a double-edged sword for empowerment and repression. The terrorist attacks in Madrid, Spain, in March 2004, were initiated by detonating bombs using cell phones that killed approximately 200 people. The fear that cell phones could have been responsible for coordinating the July 7, 2005, London bombings led New York's Metropolitan Transportation Authority and the Port Authority of New York and New Jersey to cut cell-phone service in the tunnels that linked Manhattan with New Jersey, Brooklyn and Queens in the immediate aftermath of the London bombings.

The 2004 Indian Ocean Tsunami disaster was well documented in an emotional and compelling way through “accidental” or “unintentional” citizen journalists equipped with camera-ready mobile phones that were ubiquitous, mainly among the tourist populations. Photo sets of the disaster and of missing persons[7] were uploaded both to Flickr, a free photo sharing site, and blogs, with content disseminated outside the purview of Big Media Web sites. Tsunami eyewitness Sanjay Senanayake (aka "Morquendi"), a Sri Lankan blogger and TV producer, participated in emergency rescue and relief efforts by providing live text-messages to Rohit Gupta, a blogger in Bombay, who posted the messages as-is to a blog once titled Dogs Without Borders, providing vital updates that the media were not providing. In the Sri Lankan disaster areas, landlines were down, and mobile phone voice networks were jammed, but Short Message

Service (SMS) or text messaging was relatively undisrupted.

One of the more fascinating aspects of mobile phone usage through this disaster was in harnessing a broad, collective participation in fundraising. Using the distributed channels of the mobile phone network, telecommunication carriers working in conjunction with ordinary SMS users, launched fund raising campaigns through using the donations of SMS text messages, raising millions of dollars in aid to the Tsunami-affected region in such countries as Sweden, Norway, The Netherlands, Italy, The UK Germany, France, Portugal, Spain, Greece, the Czech Republic, Switzerland, Belgium Turkey, South Africa, Malaysia, Singapore, South Korea, Hong Kong, Australia, Canada and the USA.[8] Some governments, notably the Italian government, corresponded with stranded South Asian citizens via SMS, with the message: “From the Foreign Office, please reply by indicating your identity, health conditions and location. Thank you." [9] It cannot be denied that big telecommunication carriers assisted the stranded. ForgetMeNot Software Limited, the operator of 2-way messaging service ChatBar, permitted free SMS to and from affected countries.[10] Asian telecommunication carriers sent SMS messages to the 10,252 phones roaming on Sri Lanka’s network giving the owners a number to call for help. Undeniably, digital divides were evident in who had access to usable technology. The South Asian governments lacked access to an early warning system plan or an SMS-equipped mobile communications system plan for disaster management. Wealthier tourists, armed with the latest technologies, were better equipped to receive early warning messages and ‘smart mob’ the disaster via equipped mobile technologies when compared to the local residents.

The recent London bombings on July 7, 2005, and to a lesser extent July 21, 2005, signaled the subversive significance of camera and video equipped mobile phones as an empowering device for citizens, enabling them to provide first-hand reporting of terrorism’s impact outside the production of Big Media or government. Writing for the YaleGlobal online, Mark Glaser (2005) noted that on July 7, 2005, within the first 24 hours after the underground and bus bombings in London, the BBC received 20,000 written accounts via e-mail, 1,000 photos, and 20 videos from citizens. Traditional news outlets such as the Guardian and the BBC openly solicited comments, photos, and video from citizens’ cell phones and the BBC created Web pages to display unedited citizen comments.[11] No longer solely dependent on mainstream media (MSM) for distribution outlets, citizens created their own news accounts, disseminating their do-it-yourself (DIY) cell phone content through free blogging software and Web sites. Photos taken from mobile phones were uploaded to free photo-sharing sites such as Flickr, using tags or keywords, all now accessible through a community tag pool photoset dubbed ‘7/7.’[12] Adam Stacey provided one of the first eyewitness images via his camera phone to a moblog called Alfie’s Discotastic Moblog.[13] The image subsequently made its way to Wikipedia, Sky News, Associated Press, the BBC, and the Guardian, before making its rounds to most US MSM media. The grainy appearance of the cellphone image did not affect its leading role in MSM publications, which a few years ago, would have shunned the picture for its poor quality. The image is now licensed under a Creative Commons’ license,[14] a license that allows free usage of the photo by both MSM and the public.

The US Hurricane Katrina disaster brought out attempts to merge audio blogging or podcasting with mobile technologies, termed mobcasting. Kaye Trammel, a Louisiana State University professor, used her Blackberry wireless email and cell phone handset to post updates to her blog[15] during the hurricane disaster. Textamerica,[16] then a camera phone mobile blog company that offered the public the ability to create free moblogs, developed a partnership with NBC universal, setting up a site for posting images from the cellphone via MMS and email. However, mobile communication blogging was not as frequent as in the prior disasters. The lower rate of mobile communications dissemination in the US, coupled with the fact that many who were stranded in the hurricane’s path were poor, could be cited as reasons for the lack of mobile usage during this disaster.

There are concerns with the empowerment that citizens can gain with mobile phones. Invoking 18th century utopian philosopher Jeremy Bentham's image of the panopticon—a prison comprised of cells with windows facing inwards where jailers could look out and inspect the prisoners at any time—Charles Stross (2002) writing for now defunct Whole Earth magazine, highlighted the risk of current technologies that permit the construction of a Panopticon Singularity through a society of constant, omniscient surveillance. Freelance writer and blogger Jamais Cascio (2004) noted some of the benefits and drawbacks inherent in the dangers of mobile technologies, paired up with GPS, GIS, social software, RFIDs and "smart dust", portending the move towards a future society of potentially invisible wearable memory assistants that can record day to day activities in an “always-on” constant fashion, creating a scenario analogous to what he calls the ‘participatory panopticon. This pervasive “see, snap, send” impulse identified by Cascio,[17] promoted through mobile devices such as the network-connected digital camera and the wireless camera phone, was elaborated upon by the said author at the 2005 MeshForum conference in Chicago:

This won't simply be a world of a single, governmental Big Brother watching over your shoulder, nor will it be a world of a handful of corporate siblings training their ever-vigilant security cameras and tags on you. Such monitoring may well exist, probably will, in fact, but it will be overwhelmed by the millions of cameras and recorders in the hands of millions of Little Brothers and Little Sisters. We will carry with us the tools of our own transparency, and many, perhaps most, will do so willingly, even happily.

This bottom-up or inverse version of citizen surveillance has been captured by the neologism sousveillance, a term coined by Steve Mann (no date), professor in the department of electrical and computer engineering in the University of Toronto, to suggest citizen's watching from below, an inverse positioning that can destroy Big Brother's "monopoly on surveillance." But, the dangers of the always-one panopticon, and the fear of the loss of public privacy as a result of citizens recording the actions of others, led Glaser (2005), writing for the Online Journalism Review, to question whether citizen journalists were turned into citizen paparazzi as by-standers trampled over victims to get the best pictures in the immediate aftermath of the London bombings. PicturePhoning.com, a blog that chronicles the use of mobile phones in citizen activism, commented on the 29-year-old Naulchawee in the Tsunami-devastated region who, like many other spectators, was posing for a photo alongside the bodies of dead children.[18] Many fake Tsunami photos that were also disseminated via the Internet in the guise of the real incident.[19] UK newspaper The Age (2005) newspaper reported on the bogus email being sent out after the Tsunami asking for aid donations, and the misleading SMSmessages being sent out warning of food-borne viruses in the seafood. Dan Gillmor,[20] once a traditional journalist working for the San Jose Mercury News, and now a full-time advocate of citizen journalism, noted that this new public transparency and voyeurism will inevitably necessitate both the redrawing of cultural norms of behavior for what is ethically acceptable to record and the idea of what it means to be entitled to a sense of privacy in public spaces (Glaser, 2005).

Blogs

Free blogging software has been one of the most significant factors contributing to the loss of Big Media hegemony as news production and dissemination toolsets have now been democratized to the masses. Blogging has had a short history. Pyra Labs' cofounders Evan Williams and Meg Hourihan launched the first blog tool, Blogger, in 1999, allowing free usage. Google bought out the company in 2003. Other early blog tools included Pitas in July 1999 developed by Andrew Smales, a programmer in Toronto, Paul Kedrosky's GrokSoup in 1999, and LiveJournal created in March of 1999. LiveJournal was acquired by the company Six Apart in Jan 2005. Six Apart's blog tools included the release of Movable Type 1.0 in 2001and Typepad in 2003. An open source tool, Wordpress, was launched in 2003, and the latest tool, MSN Spaces was launched in 2005. It is in blogs that many new media advocates of digital democracy find promising home in the tool's ability to reconnect to the common masses. It is hard to dispute the potential in blogs. David Sifry, cofounder of blog aggregator Technorati, found that the number of created blogs has been doubling every five months for the past 3 years.[21] As of 2005, Technorati was tracking 19.6 million blogs.

Citizen journalists used blogs both to document their experiences in dealing with the disaster/terrorist act, and to provide an activist stance against unfortunate circumstances. Staff writer Lisa Priest of the Globe and Mail referred to the Internet as the "eyes and ears of the tsunami disaster". In examining the 2004 Indian Ocean Earthquake disaster, several blogs functioned as lifelines when it was said that the government was withholding information or the media was too slow to release timely updates. Commenting on the significance of blogs, blogger Evelyn Rodriguez who has been widely interviewed by Big Media upon her survival after being caught in Phi Phi, Thailand due to the Tsunami, saw the significance of blogs during this time period in its role in information exchange, as a change agent, bringing the story closer, and in its public platform function.[22]

Many blogs provided direct first-person accounts or published first hands accounts sent in by others about the disaster,[23] providing updates not covered in MSM.[24] Bloggers also used their blog to coordinate relief and a roundup of both traditional and smaller charities:[25] bloggers at the World Changing blog worked in conjunction with the Architecture For Humanity Site to create fundraising goals for the South Asian people.[26] Within 12 hours after the Tsunami disaster, Peter Griffin, a communications consultant in India, worked in conjunction with Indian bloggers Dina Mehta and Rohit Gupta of the WorldChanging blog to create the SEA-EAT blog.[27] As clearinghouse for resources, aid, donations and volunteer efforts, this blog reported in its early development on December 28, 2004, to have over 21,000 visitors in 24 hrs with at that time 30 contributors,[28] more of an audience that many Big Media sites or governmental organizations. According to Phil Nobel of PoliticsOnline's (2005), the SEA-EAT blog moved to the 10th most visited humanitarian site on the Web, encouraging widespread financial contributions. A site was developed as a Tsunami warning tracker.[29] Many citizen journalism blogs functioned as virtual lightposts for the missing.[30]

Many trace the rise of citizen journalism videos or the phenomenon of video blogging to the Tsunami disaster. Many tourists shot videos from their cell phones and portable digital camcorders, posting them to blogs and Web pages for viral dissemination. Cheese and Crackers, a site developed by a then 21-year old US undergraduate student Jordon Golson, became a clearinghouse for Tsunami amateur video and videoblogging, which was eventually picked up on from Big Media. The inability of the site to host all of the amateur video due to bandwidth limitations led to hosting by many anonymous benefactors, one being the Internet archive.

Like the Tsunami incident, many Londoners responding to the July 7, 2005 terrorist attacks posted their mobile phone pictures to blogs. However, unlike the Tsunami where the residents there operated for the most part independent of Big Media, Londoners anxiously sent in their photos and videos, shot from cell phones, to encouraging Big Media organizations such as the BBC, the Guardian, and Sky News. Yet, blogs still play a noted part in the public's articulation

of the disaster,[31] largely in part because of the availability of free and cheap blogging platforms. Editor, writer, and blogger Tim Porter, a US Blogger, noted that the "first day no longer belongs to reporters," particularly since technologies allow citizens to cover the news with greater updates that a newspaper delivered to one's house the next day.[32] Porter identified a shift in the importance of Big Media due to the proliferation of citizens' media, afforded by free publishing blogging outlets.

Unlike the first two incidents, the US media were not caught off-guard for the Katrina Hurricane Disaster, with many setting up media blogs posting up-to-date entries from the scene of the disaster.[33] Losing vital infrastructure related to its print publications, the New Orleans's NOLA turned its entire newspaper into a blog, allowing citizen contributions to be added, unedited to its site, while providing a major public service both to its citizens and to the New Orleans police department looking to rescue trapped survivors. Several citizen journalism blogs arose to record first-hand experiences of the Katrina disaster,[34] with many providing a platform to voice strong opinions on governmental neglect, as well as race and class issues. One of the best citizen-journalism blogs was the Slidell Hurricane Damage Blog,[35] run by Brian Oberkirch, which provided hurricane information and vital updates on a hyperlocal scale to the residents of Slidell, Louisiana. On a live panel session at an Austin one-day conference titled, The Blogging Enterprise, Oberkirch noted that they had 85,000 visitors in the first few weeks, with the site now permitting disaster victims to also post information to the Weblog via email[36] or through a form-based tool. Reflecting on the significance of the site in its ability to post eyewitness accounts, amateur photos, and direct official information, Oberkirch noted that "the blog posts became the virtual lightposts people used to tack up 'missing' notices, a la 911."[37] Another well-read blog was the Interdictor, a LiveJournal blog[38] by Michael Barnett, a previous consultant for DirectNIC, who remained among others in the 10th floor of a 27th floor building in New Orleans providing vital updates on the state of city's destruction. His blog was closely watched by many Big Media outlets who turned to many citizen journalism sites for the inside information they could not provide. Blogs arose to provide access to shelter and housing for the evacuees.[39] Some other blogs questioned the racist nature of AP reporting, which made distinctions between white and black residents who were taking food without paying.[40]

Political bloggers used the blog medium to engage in more activist activities. Political blogger Josh Micah Marshall produced a community-developed Katrina timeline of events through open collaboration with his online blog readers.[41] A famous audio mashup, George Bush Don't Like Black People,"[42] was then loaded to the once popular free citizen's media storage site OurMedia, allowing it to go viral on the Internet. Many conservative bloggers turned their activities towards the constructive act of raising money for relief. Forming a blogging for relief weekend, a total of 1,877 mostly conservative blogs[43] participated in raising $1,347,493 million in donations. Maintaining political divisions in the blogosphere, left-leaning bloggers formed their own relief fundraising drive through dropcash raising slightly under $200,000. As opposed to generating relief aid, most left-leaning political bloggers used their blog as a platform to deliver a harsh critique of the Republican government for what was perceived an overt neglect of the black and the poor in the city of New Orleans.

The robustness and internal logic of the networked blogosphere can be seen in the news feeds that aggregated the blogs postings on each of these events. Working off of the individualized tags or categorizations that each blogger used for their postings, the brainpower of the community's wisdom was gathered through accessing feeds or aggregations of the blogger postings on the Tsunami,[44] the London bombing incident,[45] and the Hurricane Katrina incident.[46] Working directly off of the user-generated tags, termed folksonomies, as opposed to top-down delivered tags, termed taxonomies, it was not uncommon to see many feeds for each topic in the distributed network of the blogosphere. Tag feeds remind us that the power of blogs is in its networked conversations, conferring authority to no one specific blog or elite institution, but spreading power end-to-end by permitting a shared, community structure to emerge from the blogosphere's distributed mode of content publishing.

Wikis

Commenting on the role of Wiki news[47] and Wiki journalism, CNET News (2005) noted that Wikinews, in conjunction with other volunteer-collaborative sites "are quickly being recognized as important gathering spots not only for news accounts but also for the exchange of resources, safety bulletin boards, missing person's reports, and other vital information as well as a meeting pace for virtual support groups." Wikipedia defines a wiki as "a type of website that allows users to add and edit content and is especially suited for constructive collaborative authoring."[48] Like blogs, many Wiki tools such as SeedWiki[49] and are pmWiki[50] are free. Calling the phenomenon wiki journalism, Daniel Terdiman (2005), staff writer for CNET news, noted in another article that "wikis can be a life-saving resource that provides real-time collaboration, instant grassroots news and crucial meeting places where none exist in the physical world."

In all of the said disaster and terrorism time periods, wikis played a significant role as a collaborative, organizing space

for ordinary citizens to discuss and plan for disaster management. Wikis were also used both as a form of creating collaborative news stories and as a way to form citizen activism responses to aid victims with disaster management and recovery across global boundaries. In terms of Wikipedia, Glaser (2005) noted that the citizen-written entry for the "7 July 2005 London Bombings" was edited more than 5,000 times, leading him to state that "reading through those entries is like watching a sausage of news being made by a community, edited and massaged into a historical record."

One of the biggest trends, initiated from the Tsunami disaster, was the use of Wikis to enable group collaboration of humanitarian resources, relief (financial, food, shelter, technological), and missing person's sites. The Wikis demonstrated the global reach of the Tsunami collaboration, providing a transparent framework for the connected community to publicly track the project goals, needs, and resources. Like the Tsunami disaster, the Katrina disaster used wikis as an information space to enable group collaboration and pooling of resources through an open, living document, which was editable by the wired community of mobilized citizenry. One of the earliest wikis was developed to support the Slidell Hurricane blog to ensure that missing person's names were not buried among the posts. A global effort to aid Katrina survivors was launched with another wiki. A wiki was launched to enable evacuees to find shelter. Other more notable wikis were set up to aid disaster planning for future natural disaster occurrences, the most notable being the Recovery 2.0 wiki[51] with a public goal of providing "a clearing house for independent initiatives towards building reliable web-based platforms for disaster recovery efforts." This current wiki has information on standards, projects, practices, and open source participatory design, and it lists current projects for such disasters as Katrina, the recent AsiaQuake, and ShelterFinder, the latter which connects homeless to available shelters.

Wikis also provided an environment for Internet telephony. Using a free Internet call program called Skype, bloggers created what was called a Virtual Call Center for both the Indian Ocean Tsuami disaster and the US Katrina disaster[52], displaying the information on wikis. Blogger Dina Mehta from India participated in both the Tsunami and Katrina projects, and said of her experiences with Katrina that "What amazes me though, is that I can volunteer my time, sitting in my living room at home in Mumbai India, and be of use to help those seeking information about their loved ones who are missing on that other side of the world."[53] Mehta's experiences highlight the significance of the free tools of Wikis and Skype to fostering global interconnections among common citizens in times of disaster management. Mehta is part of a network of bloggers contemplating how these grassroots call technologies could work in conjunction with SMS-type systems to reach those areas "poorly connected to the Internet" in times of disasters.[54] As is evidenced by their current attempts, there is no guarantee that a technology's development initially serves the interests of everyone. Their overt attempts to shape the creative usage of these technologies are testament to the importance of open standards and flexible architecture in the technology's infrastructure.

Technological Development and Deployment

What role can citizen's play in shaping technology's development and deployment in times of natural disasters or terrorism acts? This paper argues that the availability of open source software, open standards, and open software architectures, a trend that has been developing since the 1980s in software development but which is now gaining momentum in the strong push towards amateur production, was very evident during the disaster/terrorist times as citizens gave generously of their time and talent through the gift economy to forge local and global connections to construct software that was distributed, bottom-up, and open. Much of this collaboration occurred across global borders in an attempt to empower citizens to self organize outside the auspices of formal organizations in an end-to-end fashion on the Internet. Commenting on the Tsunami disaster, PoliticsOnline (2005) noted that they witnessed "the truly enormous potential of the Internet come to life - the power of the Internet to instantaneously link millions of people together in a common and concerted effort with real and tangible results."

Many of the technological blogs showcased the enormity of the technological gift giving and generosity that abounded during these crisis times. For the 2004 Indian Ocean Earthquate, Priya Prakash developed a free mobile Tsunami Helpline WAP site called Tsunami Helplines[55] viewable only on a WAP compatible browser on a mobile phone. Developed specifically for mobile devices, the technology was devised for victims with limited access to computers, limited knowledge of who to call for medical aid, or for fieldworkers wanting to find out consulate/local hospital/authorities emergency helplines for victims/relatives. Bloggers and technologists offered donations of time to the setting up wireless networks and the installing of computer equipment to ensure the survivors had the connectivity necessary to correspond with friends, family, and governments.[56]

Regarding the Indian Ocean Earthquake disaster, many technical bloggers turned their attention to the lack of a proper SMS warning system in the region and offered both quick technological solutions and advice on the proper method of technological deployment in these regions. The significance of blogs and RSS syndication, the latter an XML file that provides newsfeeds, were vital to connecting global bloggers with interest in assisting in designing technological solutions. BBC correspondent Clark Boyd (2005) details how a Trinidadian blogger, Taran Rampersad, responded to the call from Sri Lankan blogger Sanjaya Senanayake's blog to make better use of SMS in mobile networks. Rampersad's call for a SMS alert system led to global collaboration on the Alert Retrival Cache (ARC), a system built in

one night with the assistance of text message guru Dan Lane in Britain using open source software. Commenting on the speed of development of the project, Rampersad noted that, “there is a definite lack of a sense of urgency in governmental institutions.”[57] The ARC project lives on in the Alert ReCeive and Transmit (ARCTX) project, which has the goal of getting trusted alert operators on an email list where future warnings can be sent out via word of mouth to rural villages in future times of disasters.

Many technical bloggers took to critiquing the disaster response preparedness of the South Asian region, pointing to the necessity of using tailored technologies to respond to the disasters in developing countries. Technical blogger Jamais Cascio of WorldChanging.org warned against centralized emergency infrastructures because of its openness to a central point of failure. Preferring SMS as a more distributed, citizen-led initiative, Cascio noted that SMS initiatives would only have to hit a certain number of phones as opposed to the entire network, to be an effective tool in spreading the word about impending future disasters. According to Cascio:

Imagine a site which collects storm/earthquake/tsunami/disease outbreak/etc. alerts and announcements, making information available by region. You can then register your SMS number or email address with the site, and give it your current location -- changeable as you travel, of course -- so the site can send you updates and alerts. …… The system could flag those events of particular import, and even provide short safety notices for responding to the particular danger (e.g., "seek higher ground" or "avoid contact with birds"). Imagine how many people could have survived this week's tsunami if a small number had received warnings on their mobile phones and told those around them.[58]

PBS writer Robert Cringley (2004) critiqued the involvement of government, decrying government efforts during times of disasters as slow, mired in bureaucracy, limited in scope and innovation, and limited in scalability. According to Cringley:

Here's the problem with big multi-government warning systems. First, we have a disaster. Then, we have a conference on the disaster, then plans are proposed, money is appropriated, and three to five years later, a test system is ready. It isn't the final system, of course, but it still involves vast sensor arrays both above and below the surface of the ocean, satellite communication, and a big honking computer down in the bowels of the Department of Commerce or maybe at NASA. That's just the detection part. The warning part involves multilateral discussions with a dozen nations, a treaty, more satellite communication, several computer networks, several television and radio networks, and possibly a system of emergency transmitters. Ten years, a few million dollars and we're ready.

Homeland Security Consultant and blogger David Stephenson (2004) noted elements of disaster-secure technological design, which include that the network design be decentralized, in the hands of the general public, location-based, empowering, two-way, redundant, collaborative, transparent, trustworthy, and IP-based. Rotary World Peace Scholar at the University of Queensland, Sanjana Hattotuwa (2005) acknowledged that though technology is often critiqued because of its limitations when ground infrastructure is destroyed, ICT’s can play an important role in medium to long-term needs within developing countries. These needs include technology’s role in nurturing change processes, creating mobile telephony and early warning systems, coordinating work of aid and relief agencies, and building secure virtual collaborative workspaces for a discussion of both short-term and long-term knowledge networks both within regions and among relevant diasporic communities.

The conscious shaping of technology to be a tool to serve the people as opposed to the elite was most apparent in the US Katrina Hurricane disaster, where a series of grassroots, open source development projects led to a technological synergy that is currently unparalleled in prior disaster time points. It is impossible to mention all of the technological gift giving and distributed development that occurred during this disaster time period. One big phenomenon was the use of mapping, GPS, and satellite imagery to view the devastation of the city. Mashups, the creative mixing and hacking together of hybrid Web applications out of a multitude of different sources but appearing seamless to the end user, arose combining the latest satellite imagery with maps and geodata to provide local information through using the open Application Programming Interfaces (APIs) of Google Maps and Google Earth. The Katrina hurricane disaster saw the creative reworking of mashups, one notable one conceived of by Jonathan Mendez and developed in under three hrs by Austin-based programmer Greg Stoll tapping into the open Google API to allow people to enter their specific address for damage assessments of their homes.[59] Arising out of a selfish desire to help his parents, Ryan Singel of Wired News reported that their housing damaging mapping site became “one of the most remarkable” technological efforts, while BBC news declared that the “sheer usefulness of these mashups is the clearest possible example of how online access to high-quality geographical data is going to change the world.” The site, which currently contains information for Katrina, Rita, and Wilma hurricanes, is testament to how quick technological services can be devised to assist the disaster-stricken populations when APIs remain open to remixing and mashups.

By far, one of the most significant attempts to shape the development of disaster technology as a tool to serve the people was in the positioning of open source solutions to the creation of disaster management technology. There was an

outpouring of selfless acts of software development, which led unfortunately to a widespread proliferation of dozens of Katrina missing person's databases on the Web including Craigslist, making it difficult for survivors to locate the missing.[60] David Geilhufe, working in conjunction with Salesforce.com, CivicSpace, and central technical experts Ethan Zuckerman, Zack Rosen, and Jon Lebowsky, embarked on a all-volunteer project, the KatrinaPeopleFinder Project,[61] with the central goal of combining all of the missing persons databases and message board data into a single model of a central database that could be searchable, minimize record duplication, and provide a data specification that could be used to solve the missing persons problem.[62] Breaking up the stages of the project into a technical venture to scrape different databases and a parallel, distributed volunteer data entry process from message boards, a joint effort was achieved among Social Source Foundation, Salesforce.com and CivicSpaceLabs.[63] Sites were developed for the programmers,[64] as well as for other support positions as project leaders, the data entry volunteers, and finally the marketers who would assist in getting the word out about the project. An official open data exchange format called the PeopleFinder Interchange Format (PFIF)[65] or XML technical specification for exchanging people information was developed to facilitate all of the various databases syndicating information into a single database. The success of the project was its ability to chunk data into record sets of 25 persons, permitting volunteers to donate only small amounts of time to complete defined tasks. The distributed and collaborative nature permitted over 620,000 data records to be scraped and manually entered by over 3,000 volunteers, distributed and disconnected, between September 3 and September 19, resulting in the data being used by both the Red Cross and Microsoft.

Standing firmly on open source principles of distributed software development, Geilhufe noted that "Open Source means that no one has to ask permission or buy a license to mount a disaster response." Geilhufe uses the term 'social source' to refer to the "idea that technology can be harnessed for a social mission by employing community development, online community, and web 2.0 strategies."[66] In another area, he notes that open source is central: "This is an important theme, the technology has to be pre-positioned, accessible, and you can't need to "ask permission" or even involve the folks that "own"/maintain the technology to use it for your purposes."[67]

The proliferation of several custom built databases duplicating lists of Katrina missing persons also led to a long term effort by several blogging technologists to try to attempt better self-organization in preparation for future disasters and/or terrorist attacks. The awareness that the strength of the Internet, its distributed decentralized nature, was also its central weakness in the donation of duplicated time and talent, blogger Jeff Jarvis, new director for the City University of New York and prior creative director of Advance.net, called for an open discussion on the importance of positioning technology to better share information, report and act on calls for help, coordinate relief, connect the missing, provide connections for such necessities as housing and jobs, match charitable assets to needs, and get people connected to world sooner.[68] Getting attention from a large amount of technical bloggers, programmers, and developers, a meeting of 45 strong was held at the Web 2.0 conference in October 6, 2005, in San Francisco to discuss how to better swarm with more intelligence and with greater communication in times of disasters and terrorism acts. As a result of that meeting, a variety of tools have been set up to facilitate more efficient and effective virtual spaces to discuss more sophisticated technological solutions that prevent duplication and redundancy when creating distributed software for future disasters. The recovery2.0 wiki, list project components that can be helpful in times of disasters: shelter operating system, disaster zone visualization, recovery purchasing, geographic database, phone bank network, donation management, emergency relay service, and a mesh network.[69] The goal: to provide a more transparent infrastructure for future collaboration among disparate developers.

Conclusion

Can technology be pre-positioned through citizen-led initiatives to function as a 'second superpower' in times of disasters and terrorism? Are open forms of technologies and new mobile technologies providing greater avenues for cooperation and amateur forms of engagement in journalism and technology? According to Moore (2005):

In the emergent democracy of the second superpower, each of our minds maters a lot. For example, any one of us can launch an idea. Any one of us can write a blog, send out an email, create a list. Not every idea will take hold in the big mind of the second superpower—but the one that eventually catches fire is started by an individual. And in the peer-oriented world of the second superpower, many more of us have the opportunity to craft submissions, and take a shot.

It is undeniable that both there is a new technological and amateur revolution afoot that has empowered many common users to publish their content, ideas, and projects outside the realms of Big Media, government, and big technological corporations. This phenomenon has flourished in recent disaster and terrorism times. Captured in the ubiquity of the term "open source", technologies ranging from blogs, to wikis, to open source technological pursuits were widespread through all of the data points selected. Free photo sharing sites such as Flickr, free media storage sites such as OurMedia, and blogging syndication services working off of user-generated blog tags, all provided a steady stream of alternative media content for both wired citizens and users desiring more information. The ability to globally collaborate through Skype Internet telephony also allowed interested parties in different countries to work together to frame shared solutions to disaster management. The fact that many of these technologies are "free" has enabled victims and activist to

be empowered to self organize.

But, is everyone empowered to act in times of disasters and terrorism? It is clear that participation in this online technological revolution is open only to those who have access to technologies or the skills to use them. Oftentimes, victims of disasters and terrorism are the least connected as technological infrastructure is usually destroyed or jammed. It is clear that each country must frame technological solutions to empower its citizenry dependent on the popularity of the given technology in the country's context. The question becomes, how do we ensure that those that are disconnected benefit from the advantages of these technologies in times of disasters and terrorism? With the growth of mobile communications worldwide, particularly in lesser developed countries, SMS seems to be a viable solution to enabling citizen empowerment. As some blogger technologists highlighted, an SMS solution can be helpful for viral message spreading through friend of a friend techniques. All that would be required is a trusted email list of central network actors or nodes for disaster or terrorism response management to be effective. The Alert ReCeive and Transmit (ARCTX) and recovery2.0 are two projects that enable Internet telephony solutions to future disaster response management.

But, with the promise of mobile technology empowerment comes one of the bigger problems: the threat to individual privacy. As earlier disasters and terrorism acts have shown, the exploitation of disaster times by citizens eager for spectacle has been seen through all of the crisis times cited in this paper. Can we afford to live in a society where everyone is watching everyone? Surveillance and privacy concerns are warranted in this new environment where the tendency for rampant abuse of citizen privacy rights is sanctioned with the new fears of terrorism that abound globally. With the future push in expanding mobile technology, there is a dire need for a redefinition of what constitutes privacy in public spaces.

Undeniably, open, accessible, flexible, and transparent technologies provide the greatest hope for citizens to self mobilize in times of disasters through providing avenues for the enlistment of heterogeneous actors. Citizens used these open and free technologies to create alternative citizen journalism outlets, citizen activism pursuits such as fund raising, relief coordination, and shelter/food drives, as well as devise creative ways to coordinate technological solutions through distributed and global initiatives. The open source revolution, begun in the 1990s on the heels of the free software movement begun in the 1980s, has fueled this new trend towards amateur forms of creativity, be it in journalism or technology. Using science studies to frame this paper's analysis, this new revolution is attacking elite top-down structures that wield power, centralized authority, and economic control over the masses. The importance of maintaining open infrastructures for creative synergies or mashups in the future is underscored by how citizens took advantage of open APIs to provide vital informational services to victims in the said disasters, particularly in the US Katrina incident.

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Notes

[1] Steve Outing's entry on the Tsunami coverage is located at http://www.poynter.org/content/content_view.asp?id=76520

[2] Listen to Xeni Jardin's full discussion with NPR at

http://www.npr.org/templates/story/story.php?storyId=4258114

[3] See Mark Glaser's story at http://www.ojr.org/ojr/stories/050913glaser/

[4] The hypergene media blog has screen captures of MSM's attempt to attract citizen journalism content at

http://www.hypergene.net/blog/weblog.php?id=P298, http://www.hypergene.net/blog/weblog.php?id=P291 and at http://www.hypergene.net/blog/weblog.php?id=P294.

[5] Foremost among these critiques of the media's presentation of citizen journalism content was Steve

Outing of the Poynter Institute at http://www.poynter.org/column.asp?id=31&aid=87914

[6] Rheingold has a Web site dedicated to covering smart mob acts across the World at

http://www.smartmobs.com/.

[7] See Flickr photoset at http://www.flickr.com/groups/tsunami_help_missing/

[8] To learn more about the details of these SMS fundraising campaigns visit

http://www.textually.org/textually/archives/2005/01/006593.htm

[9] Learn more about this campaign by visiting http://www.textually.org/textually/archives/2005/01/00660.

[10] View the press release for this campaign at

http://sourcewire.com/releases/rel_display.php?relid=20266&hilite=.0.htm

[11] Read citizen comments on the BBC Web site at http://news.bbc.co.uk/1/hi/talking_point/4659237.stm

[12] Photosets of the London bombings are available at http://www.flickr.com/groups/bomb/pool/. Some of

the more popular tags for photos included London, bombing, bomb, bombings, and terrorism

[13] See http://moblog.co.uk/view.php?id=77571#1120732604 for the blog entry of the photo

[14] For more information on Creative Commons, visit http://creativecommons.org/.

[15] See article on Kaye Trammell at http://www.washingtonpost.com/wp-dyn/content/article/2005/09/02/AR2005090202120.html and http://www.usatoday.com/news/nation/2005-08-29-katrina-blogs_x.htm

[16] TextAmerica's Web site was once available at http://www.textamerica.com. The site is no longer active.

[17] Read http://www.worldchanging.com/archives/000680.html) for Cascio's account of the send, snap, and see impulse

[18] Read about the incident at http://www.textually.org/picturephoning/archives/2005/01/006594.htm.

[19] Visit http://www.tsunamis.com/tsunami-pictures.html to view some fake Tsunami photos

[20] Dan Gillmor has wrote a seminal book on citizen journalism titled, *We the Media*. The book is published under a Creative Commons license and is available entirely online at http://wethemedia.oreilly.com/.

[21] David Sifry's 2005 State of the Blogosphere report can be found at http://www.sifry.com/alerts/archives/000343.html.

[22] See Evelyn Rodriguez's account of the significance of blogs in the wake of the Tsunami disaster at http://evelynrodriguez.typepad.com/crossroads_dispatches/2004/12/index.html.

[23] Ethan Zuckernan writing for WorldChanging noted in his post http://www.worldchanging.com/archives/001826.html the lack of availability of information about the deaths in Myanmar due to possible self censorship by newspapers

[24] Blog with a roundup of charities: http://www.benjaminrosenbaum.com/blog/archives/2004_12.html#000151

[25] See World changing's fundraising goals at http://www.worldchanging.com/archives/001811.html, http://www.worldchanging.com/archives/001815.html, http://www.worldchanging.com/archives/001820.html, and http://www.worldchanging.com/archives/001844.html

[26] Blog available at http://tsunamihelp.blogspot.com/

[27] Post about the statistics and development of the site can be found at http://www.worldchanging.com/archives/001821.html

[28] Site available at http://tsunamiwarning.blogspot.com/

[29] Blog for missing persons located at http://tsunamimissing.blogspot.com/

[30] Archived video of the Tsunami can be found at http://www.archive.org/search.php?query=collection%3Aopensource_movies%20AND%20subject%3A%2

[31] Some blogs that contained accounts of the terrorist attacks include Norm Geras' blog at http://normblog.typepad.com/normblog/ David Carr, writing for Samizdata at http://www.samizdata.net/blog/, Matthew Sheffield posts some eyewitness commentary at http://matthewsheffield.blogspot.com/2005/07/terrorism-in-london.html. Other blogs include Metroblogging London at http://london.metblogs.com/ . For a comprehensive listing of blogs covering the terrorist attacks, see the Wall Street Journal online at http://online.wsj.com/public/article/SB112074780386479568-Fnj6Lqv_Hf1RxCwVSpb8eG0T4pg_20050806.html?mod=blogs (free link).

[32] Tim Porter's blog post on the London bombings available at

http://www.timporter.com/firstdraft/archives/000468.html

[33] Local news sites that hosted blogs include WWL-TV

and The New Orleans Times-Picayune's breaking news feed (http://www.nola.com/newslogs/breakingtp/). CNN set up a hurricane blog, as did NPR and MSNBC,among notable news organizations.

[34] A good listing of some of the top first-hand

account blogs can be found at http://www.prnewswire.com/cgi-

bin/stories.pl?ACCT=104&STORY=/www/story/08-31-2005/0004097598&EDATE.

[35] The Slidell Hurricane Damage Blog was once located at http://slidell.weblogswork.com/.

[36] For more information on The Blogging Enterprise panel on citizen journalism, see Marketing Blogger Steve Rubel's blog posts covering the forum at http://www.micropersuasion.com/2005/11/the_blogging_en.html.

[37] See http://shopsavvy.mobi/2005/10/06/what-we-learned-from-disaster-blogging/

[38] Michael Barnett's blog, the Interdictor, is located at http://www.livejournal.com/users/interdictor/.

[39] One notable site was included http://www.katrinahousing.org/,

[40] See commentary by blogger Ann Marie Coxx aka Wonkette at

http://www.wonkette.com/politics/ap/index.php#finding-versus-looting-123124 and by Michelle Malkin at http://michellemalkin.com/archives/003439.htm.

[41] See Josh Micah Marshall's Katrina timeline at http://www.talkingpointsmemo.com/katrina-timeline.php.

[42] This mashup is now available on YouTube at http://www.youtube.com/watch?v=UGRcEXtLpTo

[43] This movement was also copied by Liberal Bloggers. See http://www.shotinthedark.info/archives/006584.html for the partisan competition and http://www.dropcash.com/campaign/hurricanerelief/liberal_blogs_for_hurricane_relief for the liberal bloggers donation drive

[44] Then feeds for the Tsunami incident included http://del.icio.us/tag/tsunami, mi-info

and http://www.flickr.com/photos/tags/tsunami/

[45] Then feeds for the London bombing incident included http://www.technorati.com/search/london

http://www.technorati.com/search/%22london+explosion%22,
http://www.technorati.com/search/%22london+bombing%22, http://www.technorati.com/search/%22london+bomb%22, http://www.technorati.com/search/londres, and http://www.blogpulse.com/trend?query1=london+bombings&label1=&query2=&label2=&query3=&label3

=&days=180&x=25&y=11

[46] One popular feed for Hurricane Katrina incident was http://www.technorati.com/katrina/,

[47] Wikinews, an experiment by Wikipedia, can be found at http://en.wikinews.org/wiki/Main_Page.

[48] See Wikipedia's entry for the term wiki at http://en.wikipedia.org/wiki/Wiki.

[49] SeedWiki is a wiki farm that permits free wikis and blogs to be created. Visit http://www.seedwiki.com/

for more information on SeedWiki

[50] pmWiki is a wiki tool that is open source, requiring the tool to be hosted off of server. It is free. Visit

http://www.pmichaud.com/wiki/PmWiki/PmWiki for more information on the tool

[51] View the recovery 2.0 wiki at http://www.socialtext.net/recovery2/index.cgi

[52] The Katrina Skype information was once available at the wiki http://katrinahelp.info/wiki/index.php/Katrina_Help_Line.

[53] Read more about Dina Mehta's experiences working with Skype Internet telephony on her blog posting

at http://radio.weblogs.com/0121664/2005/09/08.html#a692

[54] To read the post where Mehta reflects on disaster technology coordination, visit

http://radio.weblogs.com/0121664/categories/businessOpportunities/.

[55] Information about the WAP-based application was once held at http://www.priyascape.com/helpline/index.wml

[56] See entry by Mike Outmesguine on donating of wireless equipment at http://www.thewirelessreport.com/search/?q=katrina

[57] Read more of Taran Rampersad's posting at the World Changing blog at

http://www.worldchanging.com/archives/001869.html.

[58] Read all of Jamais Cascio's blog posting at WorldChanging.org blog:

http://www.worldchanging.com/archives/001828.html.

[59] The housing mapping site is now defunct but was once located at http://www.scipionus.com.

[60] See Jeff Jarvis' listing of some of these missing persons databases on his blog at

http://www.buzzmachine.com/index.php/2005/09/03/lists-of-lists-of-the-missing/. Most of these databases can also be found at http://del.icio.us/tag/peoplefinder+unstructured. About.com also maintained a good database link at http://goneworleans.about.com/od/famouslandmarks/a/findsurvivors.htm.

[61] See http://en.wikipedia.org/wiki/Katrina_PeopleFinder_Project for a good description of the project. Also saee publication in FirstMonday at http://firstmonday.org/htbin/cgiwrap/bin/ojs/index.php/fm/issue/view/196.

[62] For excellent background notes on the development of this project, see David Geilhufe's blog at

http://socialsource.blogspot.com/search?q=katrina.

[63] Salesforce.com at http://www.salesforce.com/foundation/ , and CivicSpace Labs at http://www.civicspacelabs.org/

[64] See Ethan Zuckerman's post at http://www.ethanzuckerman.com/blog/2005/09/06/recovery-20-thoughts-on-what-worked-and-failed-on-peoplefinder-so-far/ for background information on the efforts to organize the programming for Katrina projects.

[65] See the open data XML data structure format at http://zesty.ca/katrina/

[66] See Geilhufe's post at http://socialsource.blogspot.com/2005/09/why-do-we-need-open-source-

nonprofit.html for more details about the usage of open source to the project's success

[67] See Geilhufe's post at http://socialsource.blogspot.com/2005/10/personal-history-of-katrina.html for

more information on the history of the project

[68] The inaugural post that kicked off the recovery2.0 efforts is located at

http://www.buzzmachine.com/2005/09/05/recovery-20-a-call-to-convene/. Further posts on the development of recovery 2.0 can be found at http://www.buzzmachine.com/tag/recovery2/.

[69] A description of the potential projects is located at

http://www.socialtext.net/recovery2/index.cgi?possible_projects.

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Section 3

Web Production, News Judgment, and Emerging Categories of Online Newswork in Metropolitan Journalism

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This paper documents a new form of news work that has emerged in online newsrooms (what I call web production) as well as the conflicting set of variables that are turning the news judgments of these workers towards a greater and greater focus on quantitative metrics of audience behavior. Emphasizing that web production is a form of newswork that transcends institutional – deinstitutional boundaries, I define the work as the aggregation, prioritization, inter-linking, and bundling of web content. Web production is particularly common in journalistic networks where pieces of content are composed and submitted by producers at the ends of the news network. The news judgments of these web producers stand in marked contrast from the judgments described by Herbert Gans and other media sociologists from the "golden age" of newsroom ethnography, and can be seen as centering around a new vision of the audience amongst online journalists. I documented at three major trends documenting a dramatically different relationship between digital journalists – particularly web producers-- and their online readership. There has rhetorical shift within the news industry towards the notion of the "active, creative audience," an increased prevalence of technologies that allowed for the quantitative measurement of audience to an untold degree, and management strategies that emphasized the widespread diffusion of audience metrics. These developments have culminated in shifting patterns of news judgment amongst online web producers and other digital newsworkers. In short, the traditional journalistic values of autonomy and professional cultures of "writing for other journalists" are being overtaken by a focus on raw audience data and what I call a "culture of the click." The paper argues that further research is needed to determine (1) the degree to which an organizational culture is emerging within online newsrooms to counteract or soften this click mentality, and (2), the exact relationship between technological, organizational, economic, and cultural factors in the development of this new news judgment.

Over the past half decade, research into online journalism and the changing conditions of newswork has moved from the speculative and prescriptive to the empirical and critical (Domingo 2008). Indeed, we may be at the opening stages of a wave of news research that rivals, or even surpasses, the so-called "golden age" of newsroom sociology in the late 1970's and early 1980's (Zelizer 2004). The only problem, of course, is that our object of analysis— journalism-- is changing faster than scholarship can keep up. This paper is part of a larger, multi-year research project analyzing an industry in transition through a combination of social network analysis, ethnographic research, and so-called "Actor-Network" perspectives on technology and organizational change (Anderson 2009). In it, I seek to cut through the massive amount of speculation on the future of the U.S. news industry with a deceptively simple question: how are online technologies, particularly those technologies that allow reporters, editors, and newsroom executives to quantify knowledge of their audience through the monitoring of reader behavior and traffic on their news websites, challenging longstanding journalistic conventions about "what counts" as news? News judgment was a unique topic of interest for the newsroom sociologists of the late 70's (particularly Gans), and it would seem to be an opportune time to return to these questions in light of new, often overlooked, technologies. Approaching question in the right manner might also shed light on related issues like the relationship between technology and news production, as well as the shifting conditions of newswork and broader changes in metropolitan news ecologies.

Recent literature on newswork

This study can be categorized as part of a broader, empirically oriented wave of scholarship focusing on the changing conditions of newswork. This literature, much of it fairly recent, can be divided into two broad streams, each with their own internal divisions and areas of focus. One stream analyzes practices of cultural and rhetorical boundary maintenance amongst traditional journalists and their quasi-professional counterparts, while a second stream examines the daily work practices of reporters, bloggers, and what I call "journalistic hybrids." Within the first stream-- focusing on boundary rhetoric and "occupational self-conception"-- some studies analyze how digital journalists envision their work roles (Deuze and Dimoudi 2002). Others examine the opinions journalists have about their non-professional counterparts, including bloggers (Roth 2004), as well as the way in which non-professional groups have been framed by the traditional media (Himelboim 2007). A final subset of research, particularly the 2006 Pew Internet and American Life survey of the "internet's new storytellers," has examined how bloggers think about themselves (Lenhart and Fox 2006)

A second major stream of the newswork literature shifts the focus from rhetoric and self-conception to the actual daily work practices of reporters, bloggers, and citizen journalists, There are subsets within this second stream, as well: the first, in Boczkowski's words, examines "the production, products, and consumption of online news by focusing *on the relationships between online and traditional journalism*, which has enabled them to place the issues under examination into larger journalistic dynamics" (Boczkowski 2007) A second set of studies, rather than comparing on- and offline newswork, specifically analyzes non-traditional journalistic practices (such as the actual day-to-day activities of bloggers and citizen journalists) (Nardi, Schiano, and Gumbrech, 2004). A third subset of scholarship distinguishes less between traditional and amateur reporters, and instead emphasizes the hybridity of new media roles. Singer (2005) and Robinson's (2006) research on political "j-bloggers" – journalists who adopt fhe traditional medium, culture, or work practices of the amateur bloggers—points to this overlap, as does Hermida and Thurman's (2007) analysis of the BBC management's struggle to incorporate user generated content into its web articles. As Robinson emphasizes, with regard to her description of the j-blog, the news production universe is far more complex and fragmented than the traditional division between amateur and professional would imply.

Although my overall research project generally followed the lead of news theorists who argue for a focus on journalistic hybridity, complexity, and diffuse boundaries, this particular paper-- with its emphasis on technological change amongst journalistic professionals-- returns to the relative stability of the institutional newsroom. It emphasizes both the work and the values of professional journalism, and looks at how the increased use of web metrics are changing those values. That said, I want to emphasize that the category of journalistic worker described in the pages that follow—the news "web producer"-- should not be thought of as simply a new category of news professional. Web production can—and is-- be done by editors at online news websites, by activist volunteers, by RSS aggregated bloggers, or by community diarists—basically, by anyone whose digital news project involves gathering, aggregating, prioritizing, and displaying content produced by anyone but themselves. (Which newsworkers would not be included under this definition? Traditional bloggers, for one; traditional reporters, for another). For the purposes of this paper, then, we should consider "web production" as an emerging category of newswork, occupying a space within the pantheon of journalistic labor alongside more traditional newswork like reporting and editing, and more emergent newswork like blogging.

Web production and online newswork

To compile the ethnographic data used in this paper I undertook a period newsroom-based fieldwork in Philadelphia, Pennsylvania, with observations completed primarily between May and August 2008. I spent time in the newsrooms of the *Philadelphia Daily News* (the city tabloid) and *Philadelphia Inquirer* (a broadsheet), as well as in what was jokingly known as the "not-quite newsroom" of Philly.com, a stand-alone website aggregating content from both papers. All three papers are owned by the same local company, Philadelphia Media Holdings (PMH)[1]. All in all, I completed more than 300 hours of observation at these three newsrooms, and also conducted more than 60 semi-structured interviews with journalists, editors, activists, bloggers, and media executives to gain insight into old and new forms of journalistic work at both traditional and non-traditional media outlets. In general, I followed a methodological approach known as grounded theory– a research process that moves from limited theorizing to the collection of data to theorizing once again. My primary goal during this period of observation was to classify the relevant types of newswork emerging in the new economy of online journalism. I did not assume the existence of any particular category of newsworker before I began my fieldwork; although I expected that I would encounter traditional reporters and editors during my travels, my primary goal was to let these occupational types emerge directly from my observations. To a degree, I adopted a posture of what sociologist Bruno Latour has called "deliberate myopia" (2005) in an attempt to not prejudge the changes in newswork I might encounter.

Philly.com, the website aggregating and repackaging the content of both the *Philadelphia Inquirer* and the *Philadelphia Daily News*, was the primary organizational locale in which I observed the work of web production during my four months in Philadelphia. It is important to note that, under the complex organizational infrastructure of Philadelphia Media Holdings, Philly.com is its own independent institution; it has its own separate building-- located on the 35th floor of a non-descript office building at Market Street, and 16th Street in Philadelphia-- management, work processes, and culture. Surprisingly, the web production team took up only a fraction of the space inside the Philly.com offices— both in terms of space allocated and number of personnel the production team was far outnumbered by the marketing and advertising departments. Like the newsrooms I visited, lower-level employee desks occupied the central space of the main room, with executive offices ringing the outside walls. Although I imagined that the office environment would be filled with fun and games, perhaps somewhat reminiscent of the so-called "new economy" workspaces I had read so much about. It was instead a surprisingly quiet place, especially in contrast to the hustle and bustle of the newspaper newsroom. "This isn't a newsroom," I was told more than once by members of the Philly.com staff.

What exactly did newsworkers at Philly.com do, and how did I come to classify their work as a distinct category of "web production"? When I began my fieldwork at Philly.com, the work day lasted from 5:30am until 11:00 at night; recent staff additions, however, where designed to allow the site to operate 23 hours a day, a process which was completed by mid-

Fall of 2009. A rotating team of web producers worked a total of four shifts, each lasting 8 hours. Every day during every shift, one staff member was in charge of the homepage (the front page), while other members of the production team were in charge of a different section of the site, called a "channel." One producer managed the entertainment page ("channel"), for instance, while a second managed the "sports channel." The day began with a 5:30 meeting between the executive website producer and the early morning staff. The meeting attempted to outline how the site would unfold over the course of the day, assuming that no major news events occurred (which was rarely the case). A second, larger meeting occurred at 11am, a meeting that I was jokingly told was a "not quite news meeting" (fieldwork, 6/23/2008.) During the not-quite news meeting, the production staff would review the stories already posted online, discuss how much web traffic they had generated, review emails from the *Inquirer* (and occasionally the *Daily News*) outlining the story budget for the day, once again trying to map the days news out as much as possible. The Inquirer's online team is short staffed today, a typical conversation would begin, and a lot of her people are off. They've got one dead, one critical in an Atlantic City shooting, the conversation continued, and we think they're going to be posting that news in a couple of hours. We could feature it in the "biggie" spot once they file it, another producer replied. The staff would also review the Philly.com production decisions already made before the meeting. We started the day with some coverage of the gymnastics qualifying competition, one producer began, but I recently moved up the *Daily News* cover story. "The teacher story wasn't doing that great, so we swapped it out for a "carnal knowledge" feature," the producer concluded. "I'm open to suggestions for a swap," the executive producer replied. "What about moving 'carnal knowledge' up further, for lunchtime?"

A brief word about the terms used in the meeting detailed above might help readers understand what, exactly it was that Philly.com web producers did every day. "Trio," "spotlight," and "biggie" referred to the main content containers on the recently redesigned Philly.com. Trios were the somewhat more static, produced pieces at the bottom end of the top half of the site; often, trio stories contained links to web video and usually fell within a certain range of story types: sports, business, movies on Friday, and a "travel trio" on Sunday. Spotlight referred to the next level of story on the top half of the website, and consisted of stories that graphically fell between the trio section, below them, and the biggie section, above them. The biggie, as the name implies, referred to the dominant story on the top half of the website, usually a story with a collection of related links and a large picture. "Swap" referred to the process by which one story was replaced with a different story on the site. Sometimes, an entirely new story would be added to the page, while sometimes a story already on the page would be "promoted," as in the above comment "I'm open to suggestions for a swap. What about *moving 'carnal knowledge up further*, for lunchtime?" "Build out" referred to the manner in which an individual story was "enhanced" with graphics and, in particular, extra links, once it ascended to the biggie position.

At Philly.com specifically, the primary role of the web producer was to decide where a news story (usually written by a reporter at the *Inquirer* or the *Daily News*) belonged on the Philly.com website. This was an issue of news judgment: is a piece of news worthy of being a "biggie," or should it be downgraded one notch and be a "spotlight," or should it neither? What were some of the mechanical work tasks that realize this role? The process can be summarized as follows: an editor at the *Philadelphia Inquirer* or *Philadelphia Daily News* online desk tags a new story "biggie breaking news," presses ctrl-alt-a to submit the story through its Content Management System (CMS) and usually informs the Philly.com offices by email that the story has been submitted. Website producers, then, enter an internal page on the Philly.com content management system that contains a numbered list of stories. Story number one is mapped onto the "biggie" spot, while stories 2 and 3 map onto the "spotlight." New stories from the newspapers tagged "biggie breaking news" automatically go in slot four. Producers, then, control access to slots one, two, and three. To move something from the top breaking news "headline slot" (position four) to the biggie slot, a producer would manually change the story position-to-position one, then add the necessary art and related links, and then update the site. Producers at Philly.com rewrite what they see to be web-unfriendly leads and headlines, procure art, and decide on ways to beef up stories with additional links. To movie into the trio, the spotlight, or the biggie website slots, a story needs art, first and foremost, as well as an additional piece of "user-generated content" (often a comment box, or a poll). A story also almost certainly needs a collection of related links if it was going to ascend to the biggie position.

In a highly schematic fashion, then, web producers might be generally defined as: aggregators, hierarchizers, inter-linkers, bundlers, and illustrators of web content. Web production is particularly common in journalistic networks where pieces of content are composed and submitted by producers at the ends of the news network. In many cases, these end-network producers are not formal members of the news institution doing the content-aggregation, and operate instead as deinstitutionalized news workers. The primary role of a web producer is this to coordinate amongst a series of quasi-institutionalized content producers. The primary tasks of the web producers are thus to build links between independently produced news stories and to rank these bundled news stories according to a rapidly changing sense of its importance, popularity, and newsworthiness could also apply to more deinstitutionalized workers at aggregative websites-- online news pages, activist journals, RSS aggregated blogs, or by community diaries. During my broadly based Philadelphia fieldwork, I observed this form of newswork in all of these places. In the discussion of news judgment that follows, however, I am confining my analysis to newswork at more traditional news websites.

Philly.com web producers are thus engaged in a constant, shifting process of "deciding what's news" for the hundreds of thousands of daily visitors to the Philly.com website. They obviously do not make this judgment about what constitutes news insofar as they assign or even write stories, of course, but they do decide about what the most "important" local news story is through their repeated hierarchization and bundling disparate links. In a sense, they tear up and rebuild the digital "front page" of Philly.com several times *an hour.* The contours, texture, and factors contributing to this rapidly deployed this news judgment, then, would seem to warrant closer scrutiny. It is to a more in-depth discussion of online news judgment that I now turn. The following section will demonstrate that a key factor shaping the news judgment of Philly.com web producers is a new relationship with the news audience, a relationship based on an increased sensitivity to audience wishes that is both rhetorical and, even more importantly, quantifiable through new online measurement tools. I begin with an overview of the (surprisingly thin) literature on visions of the audience and journalistic news judgment before moving on to a discussion of what the current data might be telling us.

"We are not old style journalism": Web production, user feedback and news judgment"

For three decades, the conventional academic wisdom regarding the relationship between journalists and their audiences has been summed up in Herbert Gans' landmark study *Deciding What's News.* Usefully distinguishing between "qualitative" (letters to the editor and to individual journalists) and "quantitative" (audience research studies) forms of feedback, Gans, in a conclusion echoed by several generations of newsroom sociologists argues:

i began this study with the assumption that journalists, as commercial employees, take the audience directly into account when selecting and producing news … I was surprised to find, however, that they had little knowledge about the actual audience and rejected feedback from it. Although they had a vague image of the audience, they pad little attention to it; instead, they filmed and wrote for their superiors and themselves, assuming, as I suggested earlier, that what interested them would interest the audience (Gans 2004, 232).

Gans argues that multiple factors play a role in journalists relative disconnect from their audience— an inability to conceive of the needs of an audience numbering in the millions; a distrust of audience news judgment; and the division between the editorial and marketing departments (creating a situation in which business personnel and news editors create a buffer between journalists and their audience). Less explicitly discussed by Gans, but also a factor in the traditional audience-newsroom separation, was the industry business model for much of the 19th and 20th century. Rather than selling the news directly to readers, journalists sold their product to advertisers, giving the audience a real but indirect influence over news judgment. The key values in tension in Gans' study, in other words, were professional incentives versus commercial imperatives. Journalists, adds Gans, "are reluctant to accept any procedure which casts news doubt on their professional autonomy" (232), and within the boundaries of his study, professional values remained strong. Nevertheless, "in the last analysis, news organizations are overseen by corporate executives who are paid to show a profit. News judgment is resistant to change, and journalists will fight hard to preserve their autonomy; but if corporate economic well being is threatened, executives may insist that their news organizations adapt" (247). And even in the 1970's, Gans notes, local news production was always more sensitive to commercial and audience pressures than national news.

Two recent studies have revisited this conventional wisdom about journalist-audience relationships; each one has found journalistic knowledge of audience's habits and news preferences to be far more extensive than in the days of *Deciding What's News.* As Outing noted in 2005, "newspaper Web sites … have detailed traffic numbers at their disposal. Today's news editors know for a fact if sports articles are the biggest reader draw, or if articles about local crimes consistently outdraw political news. They can know how particular stories fared, and track the popularity of news topics" (Outing 2006). "Server logfile data," MacGregor elaborated

is only one of the communication devices available to online journalists*but it is one of the few non-human, semi-automated ones. It does not require audience intervention because whether the audience realizes it or not, their activity is Logged … The journalist participants reveal that prolific use of server logfile data (tracking data) has arisen and developed in almost all publishing houses and editorial organizations consulted … In large media organizations, the journalists obtain the tracking data through a third party, from hired companies such as Omniture, which analyze data from server log files and make results available to the editorial department. It is often then accessed directly on newsroom computers. In some cases journalists report the information has passed through the marketing department. (MacGregor 2007)

Indeed, newspaper marketing and advertising departments are often the instigators, or at least the primary beneficiaries, of this increased knowledge of audience behavior. In essence, online editors, web producers and journalists who contribute content to metric collecting websites can know what articles their readers peruse, at what time of day, for how long, how news consumers found the article, at what point in an article a reader navigated to another page, and more.

Much if not all of this information is available in real time. I have heard (though I have yet to document) that the *Fort Myers News-Press* in Florida is using a newsroom ticker/board in order to document the popularity of different articles on their web site, with the ticker board showing the number of hits articles are currently receiving.

During my own ethnographic fieldwork I saw a shifts in the patterns of news judgment described by Gans, shifts accompanied by a deeper, more intense relationship between journalists, their audience, and the metrics used by editors and executives to map the behavior of that audience. I documented at three major trends documenting a dramatically different relationship between digital journalists – particularly web producers-- and their online readership. First, I observed a rhetorical shift within the news industry towards the notion of the "active, creative audience"; second, I saw an increased prevalence of technologies that allowed for the quantitative measurement of audience to an untold degree; third, I observed management strategies that emphasized the widespread diffusion of audience metrics. These developments culminated in shifting patterns of news judgment amongst online web producers and other digital newsworkers. In short, the traditional journalistic values of autonomy and professional cultures of "writing for other journalists" are being overtaken by a focus on raw audience data and what I call a "culture of the click."

The "active" audience

The most obvious change in journalistic attitudes towards audiences can be seen in the daily rhetoric and practices of industry leaders. When discussing a recent redesign of the Philly.com website, digital consultants summed up the new attitude toward internet consumers prevalent in much of the marketing end of the news industry. "Philly.com should do what only the web can really do," one consultant told me. "Brands across the board have shifted. You can't push from the mountaintop anymore. There is no tree line. So unless you let your users have some kind intimacy with the brand, and maybe even some control, you're going to fail. They have to play with it. It has to be 'of the people, by the people, for the people" (interview, 5/30/2008). The web audience, in short, was an active one. Journalists could no longer assume an attitude of passivity on the part of their readers.

While I observed some disconnect between the public rhetoric of audience engagement and discussions about journalist-reader relationship behind closed doors, it would be a mistake to assume that changes in newsroom attitudes toward the audience where simply rhetorical devices. Indeed, a number of actions taken by Philly.com programmers with regard to reader comments shows that the website was trying to take the interactive nature of the world wide web seriously. While Gans discusses letters and phones calls as qualitative forms of audience feedback, the internet afford readers the ability to comment directly on almost everything they watch and read. The technical possibility of such audience feedback of course, does not mean that the ability to provide such feedback is inevitable or even widespread. Indeed, executives at Philly.com spoke with pride about the fact that "default comments were on all Philly.com articles" – meaning that readers had the ability to comment on any story, and this ability would have to be taken away by site administrators rather than granted. Journalists and news executives displayed a welter of contradictory attitudes towards the feedback presented by audience members. "Philadelphia is really full of a bunch of boorish jerks," one journalist said out loud after reviewing a series of particularly nasty comments on one article. Philly.com interns, aided by an aggressive spam-filtering system (so aggressive that it censored comments discussing Iraqi "Shiites", for instance) worked to keep articles clean, but were often unsure about the line between passion and abuse. Other journalists were curious about their readers: ""I'm interested in who is leaving comments," a city hall reporter told me one morning. Still other journalists mostly ignored the commenters, dismissing them as unrepresentative of the bulk of their readership. "You have to understand, these are people that have nothing better to do than surf the internet at 11am," one journalist confided to me in a conspiratorial whisper. "They're losers." Many other journalists, (and even some of those that tried to simultaneously dismiss reader feedback) were upset by rude or vulgar reader posts, feeling that such reader comments reflected poorly on themselves as journalists or the articles to which the comments were attached. The line between article and reader feedback, in other words, was not always clear to reporters.

There were equally contradictory attitudes about the degree to which reporters and bloggers should bother to engage their readers in the comments sections of articles, though attitudes seemed to be shifting, over time, towards more audience engagement. In the early days of newspaper blogging, a popular writer told me, his online editor told a him that a blogger is the voice of god, and you're lowering your status if you engage your readers.' I was told that it would be bad if I spent my entire day …. Arguing with people in the comments section." This blogger soon changed his mind. At this point, he concluded, the ability to get conversation going with commenters depended more on "how much time I have than anything else."

One Philly.com executive summed up the attitude towards reader comments at a joint meeting between Philly.com executives and newsroom staffers. First, Philadelphians love to comment, she began. Second, Philadelphians love to spew racist trash. Third, our filtering system is really strong— "we filter out "Bastardo" and "Shiite," she laughed. And finally, we don't know ahead of time what people want to talk about. "Conversations come in surprising places. [For instance] on a story about Blackrock Capital, which is seeking tax breaks to move to Philly. Who would have though that a back and forth about tax breaks and subsidies would be a place where you'd get a really informative dialog on

Philly.com?"

As one veteran news editor pointed out to me, journalistic attitudes towards reader comments weren't all that different than their earlier attitudes towards letter and phone calls. In an echo of Gans' findings, journalists were simultaneously curious about and dismissive of their audience; when faced with unpleasant or jarring reader feedback, they often argued that the readers leaving comments were an unrepresentative minority. Indeed, if reader comments had been the extent of audience impact on journalistic processes it would be safe to conclude that, at a deeper level, not much had really changed with regard to audience impact on news processes. But qualitative audience impact, in the form of comments and other "user generated content," was *not* the primary manner in which the audience was affecting news routines. Rather, *technological developments allowing for instantaneous audience metrics and newsroom management strategies that emphasized the widespread diffusion of these metrics* marked the primary axial shift in the journalist-audience relationship.

Web metrics, management strategy, and news judgment

We can get an initial sense of what I mean here by taking a second look at the impact of user comments. While public and internal discussions of Philly.com commenting partially concerned the quality of user dialog, they primarily revolved around the *number* of comments and the manner in which commenting affected website traffic overall. The following Power Point slide, which documented the impact of making comments "default on" on all articles, is fairly typical. In effect, much of the discussion about comments concerned their ability to generate website hits.

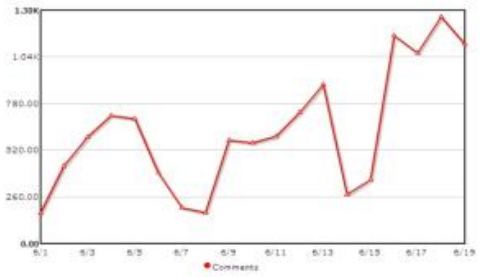

Fig. 1: Number of Comments on Philly.com Articles

One of the most interesting things about working at Philly.com, a company executive told reporters was that "you get constant feedback on your work …*and I don't mean emails, I mean constant exposure to traffic*" (interview, 5/30/2008). As MacGregor summarizes:

The journalist participants reveal that prolific use of server logfile data tracking data has arisen and developed in almost all publishing houses and editorial organizations consulted. A variety of uses, and degrees of use, are revealed, and journalists demonstrate an intelligent, sometime s critical interest, in the information provided. They make extensive interpretations (ibid).

MacGregor's overview of the adoption and use of website tracking data in newsrooms was almost entirely confirmed by my own ethnographic work. Philly.com and the affiliated Philadelphia newspapers utilized a system called Omniture to track their visitor data and, quite often, *make major editorial decisions based on website* traffic *numbers.* Once again, however, the simple existence of a technology did not mandate its use—my observations showed that the strategic use of web stats were part of a deliberate strategy for online newsroom management.

Knowledge of website traffic was widely available for journalists who wanted it. During my time at the *Philadelphia Inquirer*, I was approached by one online newsworker clutching Omniture website data in his hand. This reporter hand me a page of "click counts," sorted by author name. "We're probably headed toward a new model where reporters get paid by clicks," the reporter said darkly, only half in jest. "People who are concerned with their careers know these things, but most people still aren't concerned with stats, but I am." The reporter then told me about a powerfully written, extensively researched *Philadelphia Inquirer* story about a local army company that "just bombed on the website, it just did terrible. You want to throw fear in to the hearts of journalism professionals? That's a way."

A producer at Philly.com echoed this sentiment:

Even when I first came here, we had a much cruder system [to measure traffic], but we had skilled programmers … and we would get emails in the middle of the day which would be about which stories were doing well, and we would take them to the news meetings [of the papers] and I think they were a little shocked a lot of the time, because even then we knew that a lot more people clicked on the gossip story than clicked on your story, which you spent all this time

investigating. that was maybe not something readers cared about as much., because you know, papers don't have that same way of following what it is people care about.

But in the old days, we thought different things were more important than they are. You know a lot of [story selection] used to go by editor's interests. And of course maybe we went more with the paper and what it's strong with also, as opposed to looking at traffic reports. And realizing exactly what people click on. And you know, I've always had this argument – because I did to work on the Knight-Ridder national news team-- I've always had this argument that just because people are not going to click on a story about Iraq doesn't mean that you shouldn't have a headline up there. Because some people just want to read the headline. And it just makes you look bad if you're a big news site and you don't have the right news there. … And I think we always knew that sports was big, and gossip was big, and big talker stories were big, but, when we saw the cold numbers … I think that was kind of when a lot of people woke up.

"The bottom line is, we are not old style journalism," a Philly.com executive told me. But, that definition was no longer operative, he continued, telling me about an Philadelphia Inquirer story about a special eye virus that brought sight back to the blind. "It was an amazing story, or rather, it was an amazing whole package of stories. But it bombed. It got no traffic. And it was then that I realized we're in a new world" (interview, 6/26/2008). "The data shows our sports page is really our second homepage," another website executive told me. Indeed, a June breakdown of traffic percentages for the year to date showed Philly.com accounting for 17.2% of all hits, followed by the Eagles Forum (2.9%), Philly.com/sports (2.4%), and the Philadelphia Inquirer homepage (2.3%)—and that was before the start of Eagles season and before the Phillies World Series win. As further evidence that a focus on metrics was part of a deliberate newsroom management strategy, the top Philly.com stories as of the end of May were collected and distributed to staffers as an Excel spreadsheet:

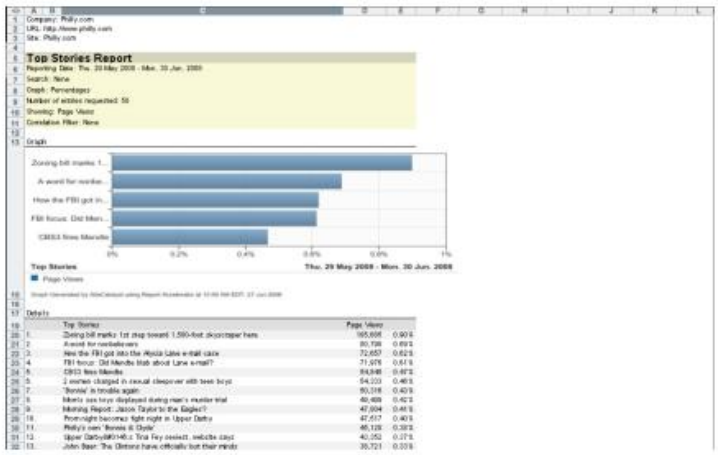

Fig 2: Online web statistics report, Philly.com

Website traffic numbers, no matter what the content of actual clicked articles, were invoked often at the *Philadelphia Inquirer* and almost obsessively at Philly.com. We hit "35.8 Million in November," went a typical presentation about the new website to the news staff, "37.9 Million in December, 38.8 Million in Jan, 42.1 Million in April, 39.1 Million in May, and 33.9 Million in June" (fieldwork, 6/25/2008). This is not good news on traffic, the presenter continued. "We're in a summer slump—and we aggressively need to find way to end it. We will protect our growth in page views! Everybody here should be thinking what can I get to Philly.com now' in terms of content. And what can I add to the story that's good for the web. There should be an urgency around the idea of sending stuff to Philly.com." There was a similar rhetoric about page views during staff meetings at Philly.com. "We're trending low for the day," went a typical summer meeting. "But, uniques were up for the day." And so on. This would then be followed by a discussion amongst the group as to why numbers were down– perhaps it has to do with vacations in the summertime, one producer might suggest. "Either way, it can't last" (fieldwork, 6/23/2008).

Even outside official meetings, traffic patterns played a major role in the selection of stories for Philly.com. "I just pulled this story off the spotlight, it was underperforming, it only had 137 page views" was a common phrase to hear shouted across the Philly.com office. "Usually give a story at least an hour to prove itself," one web producer told me "500 page views is pretty good, 1000 is great. It's easier to compare story traffic in the morning when everything goes up at the same time. Then you can basically compare different articles with each other. The afternoon, when things are more erratic, it's tougher to compare" (interview, 6/30/2008).

Indeed, it is not an exaggeration to say that web site traffic often appeared to be the *primary ingredient* in Philly.com news judgment. While MacGregor argues that "[although] data are therefore directly revising the way ''news values'' are implemented in the respondent sample, overall, social and organizational context rather than technology alone shape

the way these online professionals react to their new tool (ibid), my own ethnographic research demonstrates that Philly.com, at the time of my visit, lacked a strong organizational culture that would mitigate against the dominance of a website management strategy based on clicks. I probed this topic in three ways during my conversations with Philly.com web producers and newspaper journalists. "Is there an organizational culture that can mitigate the primacy of web statistics when it comes to choosing stories?" I first asked bluntly. Rephrasing my question somewhat during later interviews, I put forward the following hypothetical scenario: say that a tech staffer came up with a way to automate the Philly.com website so well trafficked stories were automatically placed in the biggie, spotlight, and trio slots. What would be left for a web producer to do?" Finally, I simply asked: what's the perfect Philly.com story? "The adventures of Bonnie and Clyde [two young, attractive area college students charged with identity theft] were the perfect Philly.com story. A story that is going to get tons of hits, and is going to elicit a lot of comments" (interview, 7/12/2008). "Is there a news culture at Philly.com yet?" a web producer said in response to one of my questions. "Let's put it this way: if there was, the personnel has changed so much I think there probably isn't anymore. Literally in the last couple of months, There's four of us on the entire team who are not new, and the bosses are new." "Occasionally we'll buck the trend towards click thinking, if there's a strong local news story or breaking news – we tend to do it more with breaking news—or if there's good stuff in the paper," another web producer said. "But, in general, moving away from click driven thinking is the exception."

"We're trying to be a real strong local news site that appeals to our audience and gets traffic," he concluded:

You just sort of get used to knowing what kind of news gets clicked. A story about the Middle East, a national story— no. We're trying to pick out strong local stories or strong state stories that we know will appeal to our readership. We're a news site, but we don't feel tied to the definition of news, as in breaking news. As far as the spotlight versus the biggie goes, it's intuitive, but we just put about anything we think will get clicked up there at this point. You just have a gut feeling about it. Like for an article about Michelle Obama: your gut instinct is that it's not going to get picked up, but if it's getting clicked we'll bump it up (interview, 6/24/2008).

In sum, the sudden availability of news metrics was making journalists and editors more sensitive to the implications of what their audience was reading and why. Due, in part, to a deliberate management emphasis on the widespread diffusion of metric data, along with a fairly desperate need for greater traffic numbers that could boost online ad revenues, web producers at Philly.com were basing more and more of their news judgments on raw, quantitative data. It should be obvious from this summary that there exists no simple causal relationship between new technology (in this case, web-based user tracking data) and changes in news judgment. Indeed, we can tentatively conclude that web measurement techniques count for only one aspect of the shift in Philadelphia towards a more metrics-driven, deautonomized notion of what news is worthy of being prominently featured on Philly.com. Additional factors included the need for higher amounts of web-traffic and, along with that traffic, advertising revenue; a newsroom strategy that emphasized the use of web metrics as a staff management tool; and, finally, a rhetorical shift in journalists conception of the news audience as "active" rather than "passive" and "remote." There were shifts newspaper economic systems, newsroom processes, and cultural understandings of news audiences. The emergence of a new technology-- online measurement systems was-- at best, an affording factor rather than a causal one. The exact interplay of all these relationships in the movement toward a more quantitative conception of news judgment is a topic that might be pursued in future research on this important and overlooked issue.

Conclusion: Between web metrics and "deciding what's news"

During my time in Philadelphia, I was struck by the similarity of the business models of *Philadelphia Daily News* and Philly.com. Because the *Daily News* makes most of its sales off newspaper stands, it is highly dependent on its front page to "carry" the paper. It is at the whim of what could be seen as a primitive form a "click mentality." Approaching the newsstand change in hand, the split second decision-- "to buy or not to buy"-- most resembles the image of the autonomous consumer imagined by the producers at Philly.com. Mitigating this rampant obedience to brute market pressure, however, was the self-image of the workers at the *Daily News*, a self image grounded in decades of serving as the "people's paper" of the city of Philadelphia. During news meetings, I watched the "people's paper" mentality intersect with cover stories that editors knew would sell. Often, editors would go with what sold, but just as often, they went with cover stories that we're true to the conception they had of themselves. At this early stage, Philly.com lacked such a newsroom culture; or, at the very least, the exact dimensions of that culture had yet to be fully articulated.

"We're not ashamed of the fact that one of the primary missions of our website is to build traffic," a Philly.com executive told me during a follow up round of fieldwork in the winter of 2009. That said, this executive felt that there was an emerging news judgment at Philly.com that went *beyond* the culture of the click. "Three things go into web producer work," this executive told me. "The news, what builds an audience, and what engages the community. Sometimes the three overlap. Sometimes they don't. Some of this is snobbery … And for a while, journalists didn't have any idea who their audience was or what they wanted. Now, I can not only see what someone read, I can see how far they read, if they came or went to another article, if it drove them off the site." During an organizational meeting in the late summer, a

long-time Philadelphia news editor with the *Daily News* mused aloud about what ingredients might constitute a "perfect" Philly.com news story in the much the same way he often wondered about what made for a "classic" tabloid cover page. During this conversation, it seemed obvious to me that reporters and editors alike were trying to uncover patterns of Philly.com news judgment that transcended the mere reactivity to audience metrics.

If and when such a news judgment— a judgment that differs from the kind particular journalistic autonomy exercised by most print and television reporters in the days of *Deciding What's News,* but at the same time more nuanced than simply the rote following of audience metrics— were to emerge in Philadelphia, it would echo the conclusions of most of the research done on this topic to date. Both Outing and MacGregor argue that "editors' judgment remains tantamount -- at least for now -- and that most online news editors are treating site statistics with caution (Outing 2005).

The editors and journalists agree the need for numbers. They realize that volume is essential to survival. But this sensitivity seems to enhance in an equal degree the counter response that site values must be preserved in well-articulated, often non-populist, editorial news or brand values. It is far too simple to suggest that journalism means an uncritical hunt for markets. Numbers need to attach to specific audience qualities, and this link between numbers and values is still seen as the true grail, the truly virtuous circle (MacGregor 2007).

Based on my Philadelphia research, I have come to conclusions that are somewhat starker. Editors' judgment and the "virtuous circle" between what the audience "says it wants" and "what it needs to know" are under increasing pressure from the weight of declining ad revenues and the mass of available quantitative data. Still, it seems foolish to imagine that journalists will ever be content to entirely sacrifice their professional news judgment. In order to tease out the nuances of this potentially emergent zone of newsroom culture—this middle ground between the culture of the click and editors continued sense of "what audiences need to know-- I see the need for further research. When making arguments about something as fundamental as "deciding what's news" and the impact of quantifying technologies on news judgment, it will be useful to have additional data. To that end, I am now collecting responses about audience engagement and web metrics with an online survey. I also plan to visit at least two other online newsrooms in the months ahead in order to better triangulate my extensive Philadelphia observations regarding news metrics, visions of the audience, and changes in news judgments. At least preliminarily, however, we should be cognizant of the degree to which technological, economic, and cultural factors are shaping the production of online news, and shaping them in ways that are often not immediately apparent amidst the dominant scholarly and professional dialogues about user-generated content" and the end of the newspaper industry. To the degree that online newsrooms, increasingly unmoored from their print counterparts, fail to cultivate a culture that can insulate them from "knowing exactly what the audience wants," they will fall back on a news judgment process they imagine at least serves their fragile bottom line: the news culture of the click.

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[1] In the fall of 2009, Philadelphia Media Holdings filed for Chapter 11 bankruptcy. While this development obviously plays a major role in my overall research project, I do not discuss its implications here.

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Section 4

Methods for Mapping Hyperlink Networks: Examining the Environment of Belgian News Websites

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This research is an attempt at mapping data retrieved from news websites in order to find one's bearings in the ever-growing complexity of the informational landscape. It posits that drawing maps of the hyperlinks networks in which news websites are entangled will shed new light on the web-based media outlets, by revealing an otherwise concealed dimension of online news. The paper focuses mostly on conceptual foundations and methodological issues, grounded into exploratory attempts of mapping and describing hyperlinks found within selected webpages. It will emphasize a thorough discussion of key concepts and methods exploring: (1) why map? ; (2) why map hyperlinked environments? ; (3) why map the hyperlinked environment of news websites? Questions are raised regarding the nature of links in the context of journalism, and the conception of hyperlink as adding journalistic value to the news website content.

The web is vast. Even when considering controversial or overtly underestimated figures its size makes it impossible to grasp single-handedly. Estimations vary: for example, it is said to count 19,9 billion pages (Wordlwidewebsize.com, 2010), or 10^{12} hyperlinks (Heymann, 2008). In a few words, "the web has exploded before our eyes" (Tremayne, Summer, p. 234).

Such statement could easily be transposed to the specific domain of online news, as news websites are plentiful. Traditional media organizations not only have companion websites, but new competitors entirely dedicated to online news have appeared. Other players such as blogs are also marching into the field of news. The readers keen to find their way in that environment, eager to know where these sites are situated in a more global landscape, are inevitably lost.

In this context, the most common way we use to find information on the web, namely search engines, appears to be useless. Search engines index an important part of the sprawling network, but the format chosen to present results is ascetic: a flat list of URLs of which we seldom consult more than the 20 or 30 first entries (Halavais, 2009, p. 42). Most importantly, search engines do not even remotely provide a bird's eye view, a global and coherent panorama of the territory we wish to investigate, and idea of the position occupied by every actor and element. Not only is the web largely uncharted, it also lacks geography.

The present paper suggests that maps of hyperlink networks are valuable instruments compensating for this shortage. It also advocates the application of such tools and methods to news websites. The first section delineates the rationale behind the general need for maps. Then the paper consequently focuses on maps of hyperlink networks: previously discovered properties of networks are presented, as well as two examples of existing hyperlink maps. After that, we address what is specifically at stake for news websites when it comes to hyperlink networks. Finally, the methods and tools one can use when attempting to map news sites are detailed, and first results obtained by applying them to the case of Belgian news sites are outlined.

Why map?

In everyday life, maps help us to find our bearings. Applied to the web, they could allow us to grasp a global insight, and to find our way toward specific goals. The intuitive desire to rely on maps is ingrained in the spatial metaphors that we use to talk about the web: we *surf*, *navigate* and *explore* websites that are linked to form a *network*. Common labels to describe the phenomenon include information *superhighways*, which are part of our informational *landscape*. The words we use to depict the internet have strong spatial and material meanings. As Anne Cauquelin observes, such words are "constantly sliding from one edge to the other of the semantic constellation", making the difference between virtual and physical spaces quite thin (Cauquelin, 2007, p. 18).

Among that spatial glossary, the *network* might be the most prevailing figure. Webpages are interconnected through hyperlinks, and therefore correspond to the most straightforward definition of a network: "a set of links and relations between points" (Poidevin, 1999, p. 146). However, spatially representing the world wide web is never obvious or unambiguous, whether as a network or in another form.

First and foremost, we have to remember that web pages may have a geographical referent (embodied in their domain names) but that at no point they possess inherent spatial attributes (Dodge & Kitchin, 2000, p. 72). From then on, if mapping is to be regarded as "a flat, geometrical, simplified and conventional representation of parts or the totality of the surface of the earth, in a ratio of acceptable similarity called the scale" (Joly, 1994, p. 3) it can only be applied to the most down-to-earth components of the Internet (Dodge & Kitchin, 2000, p. 72) i.e. its physical infrastructure – the machines, computers and servers that materially compose the network.

Being confronted with data with no spatial properties is an issue map-makers and information visualization specialists are familiar with: "many interesting classes of information have no natural and obvious physical representation. A key research problem is to discover new visual metaphors for representing information and to understand what analytical tasks they support." (Gershon, Eick, & Card, 1998, p. 10). Hence, mapping webpages necessarily involves an operation of *spatialization*, i.e. the use of "a number of graphical techniques and visual metaphors" in order to "map data with no inherent spatial properties onto a defined spatial framework so that it might be better understood" (Dodge & Kitchin, 2000, p. 107).

Consequently, when it comes to map the web, everything is to be invented. There is no single *true* representation of a "reality", but a variety of possible representations depending on what the map-maker wants to show. In other words, we can argue that the quality of a map relies in its adequacy toward needs, and that it is of paramount importance to understand which decisions were made about "what to include and what to exclude, how the map will look and what the map wants to communicate" (Dodge & Kitchin, 2000, p. 75). Moreover, another crucial question is how to interpret visualizations, or rather how to avoid misinterpreting it. Typically, the way we instinctively read a map – by applying our deeply interiorized habits of 2D or 3D representations of our topographic environment – is not relevant. Namely, some types of visualization imply that the distances or the north/south orientation are meaningless. To put it shortly, maps can be misleading. For instance, some maps choose to show the semantic distance between the textual content of websites. Others focus on the importance of keywords in the flow of news, or the relationships weaved by blogs through reciprocal linking. Therefore, the possibilities of interpretation strongly vary: for some, it is the size of the elements that matters; for others, their relative location, their color, the density of groupings, or a combination of these criteria. In any case, there is no intuitive reading, and every map must come with an explanation about what we might (or might not) read on it, and how to do so.

Why map hyperlinked networks?

Within the wide range of maps delineated above, my research focuses on those relying on hyperlink networks. Hyperlinks are fascinating objects *per se*, and are regularly mentioned as one of the key features distinguishing online from offline environments. They are said to affect "the overall size and shape of the public sphere" (Turow, 2008, p. 4). Together, documents and hyperlinks form networks, a concept that has become a leading paradigm for understanding the internet, new media (Gane & Beer, 2008), the economy (Kirman, 1997) or the society as a whole (Castells, 2000). On the web, however, networks are more than a useful metaphor helping us to imagine its informational structure (Ghitalla, 2009): recent experimental and empirical works have shown their powerful materiality. Therefore, the prevailing notion of network is questioned as a dominant and fashionable conceptual tool – sometimes marred with ideology (Boltanski & Chiapello, 1999; Mattelart, 1999; Rumpala, 2007) – and its substantial nature is investigated.

Networks possess remarkable properties

Network sciences investigate the properties of networks. After having emerged three centuries ago with the breakthrough in graph theory made by Leonard Euler (Barabasi, 2003), the field was expanded by social scientists in the 1960's (Tremayne, Zheng, Lee, & J. Jeong, 2006, p. 292). In the 1990's, a set of discoveries that have been labeled "the new science of network" (Watts, 2004a; 2004b) revitalized the discipline. Rooted in physics, mathematics, computer science, biology, economics and sociology (Watts, 2004a, p. 243), this fruitful ground of investigation has given birth to research into patterns of the web, which has "uncovered principles that help to understand networks of all type" (Tremayne, Summer, p. 234).

"Peculiar and fascinating properties" (Ghitalla, 2009) were discovered. For example, researchers highlighted the fact that the web is a "scale-free network, dominated by hubs and nodes with a very large number of links" (Barabasi, 2003, p. 165), and revealed "strong regularities, among which the existence of a 'universal power law'" (Adamic & Huberman, 2001, p. 131). This topology goes around with Pareto's law, or the "the so-called 80/20 rule" (Tremayne, Summer, p. 238): 20% of the nodes possess 80% of the links – a small part of websites collects the majority of links while most receive few or no links. For their part, Albert et al. (1999) established the diameter of the web and its small-world nature: despite the impressive total amount of existing websites, there are, on average, nineteen degrees of separation between two pages (Barabasi, 2003, p. 165), i.e. one webpage is only nineteen clicks away from another. Next to these studies emphasizing low distance as a characteristic of the web, researchers have shown that finding a path between two pages is not that obvious: Broder et al. (2000) proposed a fragmented model of the web corresponding to a bow-tie structure

where the direction of the links strongly matters (Barabasi, 2003, p. 166).

From those large-scale observations, research then goes on investigating smaller subsets: Sunstein (2007) discerned fragmentation within the political domain – as only 15% of the webpages he scrutinized linked to the opposite viewpoints – and others consequently warned against polarization (Webster, 2008, p. 32), a trend dubbed *cyberbalkanisation*. Finally, more and more researchers focus on web communities, scrutinizing social ties as well as technical characteristics (Adamic, 1999; Adamic, Buyukkokten, & Adar, 2003; Bharat, Chang, Henzinger, & Ruhl, 2001; Ghitalla, Jacomy, & Pfaender, 2006; Gibson, Kleinberg, & Raghavan, 1998; Highfield, 2009). This paper embraces such approaches: focusing on small-scale networks while keeping in mind the general laws discovered by the network sciences. Although applying all their mathematical and statistical tools to modest datasets does not make sense, their lessons nevertheless constitute an important background – similar to the physical laws of which we must be aware when exploring any *offline* phenomenon.

Handling smaller datasets allows a change in methods, a transition from “industrial automation” to “handiwork” (Ghitalla, 2009). Our ambition here is to overcome the frailty of previous link studies, i.e. the gap between quantitative and interpretative perspectives (Fragoso, 2009, p. 4). Semi-automated methods for mapping hyperlinked environments allow constant iterations between structure (the network of hyperlink and its particular topology) and the content (the webpages themselves). Such an approach is consistent with the assumption that “understanding links requires knowing the context and conditions in which they occur, what implies identifying sites and pages where they are located” (Fragoso, 2009, p. 8). Following Halavais “the universal nature of hyperlinking makes it a very difficult sort of artifact to understand. The question of what someone means when they create a hyperlink or when they activate one is entirely determined by the context” (2008, p. 43). In concrete terms, this translates into producing maps on which every node has been identified and meticulously classified by the researcher, and not a network that was solely crawled in an automated way by a machine.

Maps of hyperlink networks allow to perceive otherwise unnoticed features

Why is this of any interest for research? Maps are first and foremost tools for analytical reading (Ghitalla, 2008). The two examples analyzed here show the fruitful intertwinement of the maps, the contents of the websites, and their broader context.

Wikiopole is a monthly updated map showing the current state of the French blogosphere. It proposes a visualization of the Wikio blog ranking which positions blogs according to the number of links pointing to them (*backlinks*). The 1500 first blogs of the ranking are depicted, as well as their mutual links. Each node is a blog, identified by an URL. The color of the node stands for its manually assigned category (e.g. *politics*, *literature*, *high-tech*, etc.). Their position depends on the hyperlinks only: two blogs will be nearby each other if they are linked. “The links spatially distribute URLs and give birth to the general patterns of the representation (…) The graphical territory is neither governed by an outside orientation system (North/South) nor cross-ruled by fixed lines and geodesic marks” (Ghitalla, 2009).

Figure 1 shows the Wikiopole in March 2010: we can see strong “topical localities” (Davison, 2000), i.e. hypertextual proximity corresponding to similarity in content (Ghitalla, Le Berre, & Renault, 2005). Blogs on the same topic (belonging to the same category) are represented next to each other on the map, even though thematic categorization does not determine the position of the nodes. Neat, well-defined islands appear: clusters of blogs, which are heavily interlinked, but loosely connected to other groups. This means, for example, that blogs on literature intensely link to other literary blogs, but sparsely refer to blogs on politics.

Since April 2009, an interesting trend surfaced in Wikiopole, and has been dubbed “the knitters’ revolution” (Véronis, 2009a). A new island had taken shape and had grown so much that it could be called a continent. It was exclusively formed of blogs about leisure, arts and crafts, and knitting – an entire archipelago was even devoted to scrapbooking. The phenomenon was highly visible on the map and was the sign of a radical change in a blogosphere traditionally dominated by high-tech blogs (Véronis, 2009b). Even if other clues could lead to similar observations (such as the top position held by a handful of knitting blogs in the Wikio ranking), the map made it fully visible. When it was published, it made people aware of the unprecedented movement, and triggered noteworthy reactions and analyses: some underlined the gender polarization of the blogosphere (with male bloggers owning the high-tech island and female bloggers occupying the arts and crafts territory), others tried to explain the phenomenon by the foreseeable seizure of power by a mass of latecomers in a field long subjugated by a minority of early adopters (who might have departed to other territories, such as Twitter) (Véronis, 2009b). Some, finally, suggested that the event could be included in the context of media use: the success of arts and crafts blogs could perhaps be explained by the disappearance of periodical press on that topic (Silber, 2009).

Next to observations about the evolution of a system at large, maps also allow the emergence of remarkable individual features. For instance, still inside the French blogosphere, it is possible to focus on an individual: *Les coulisses de*

Bruxelles ("Brussels backstage") is a blog about European politics, held by Jean Quatremer, a journalist for the French daily Libération. This blog appears on the Wikiopole map where it shows all sign of a respectable amount of authority – if we accept the "assumption that hyperlinks somehow transmit power or credibility" (Halavais, 2008, p. 49) and that the structure of links can be used to impose a structure of relevancy (Finkelstein, 2008, p. 104).

Figure 2 shows *Les coulisses de Bruxelles* and connected blogs. If a decent amount of bloggers link to Quatremer's blog (incoming links in red), it would seem that the journalist-blogger rarely returns the favor: there are only four outgoing (yellow) links from *Les coulisses de Bruxelles* to other blogs. The situation is paradoxical: Jean Quatremer is undeniably *in* the blogosphere, but he does not really *take part* in it.

A glimpse to another map proves useful to further investigate this seeming paradox. The map of the European web (Toute l'Europe, 2009) is built on the same principle as Wikiopole, but instead of blogs, it depicts 2046 websites devoted to the European Union. Quatremer's blog is also represented on the map, but in this case (Figure 3), the linking pattern differs. Here, the blog is linked to (red links) but there are also some outgoing links (yellow), as well as reciprocal links (green).

The two maps put side-by-side show that Jean Quatremer does not take actively part in the conversation (as materialized by links) of the top-ranked French blogosphere. However, he seems to belong more dynamically to another sphere, that of the European web. This might question his identity as a journalist-blogger. On the one hand, his linking policy does not match the expected behavior of a blogger, often defined as fostering a conversational system with other bloggers (Domingo & Heinonen, 2008, p. 6) and relying heavily on hyperlinks, "an important and even essential characteristic" (Tsui, 2008, p. 72). On the other hand, when linking, he links to other media sources, institutions, or political websites, a practice that resembles the linking behavior of the "traditional" news websites (Tremayne, 2005) and the journalistic routines.

From the knitters' revolution to the journalist-blogger duality, hyperlink maps are thus helpful in visualizing phenomena that would have been otherwise hard to detect: "the reason for performing such an analysis is to reveal latent structures that are not already obvious to an observer" (Halavais, 2008, p. 45). Maps are powerful tools to initiate questionings on identities, at an individual or a more global level: they reflect "deep social and cultural structures" (Halavais, 2008, p. 39), so that ultimately, "you are what you link" (Adamic & Adar, 2001).

Why map the hyperlinked environment of online news?

The previous section showed how hyperlink maps contribute to understanding complex phenomena by detecting structural significant trends. The following section will zero in on the particular domain of online news, and argue that hyperlinks are a central issue deserving our full interest.

Why do hyperlinks matter for online news? They are not only able to "create an element of interactivity for the user" (Peng, Tham, & Xiaoming, 1999), but also seem to embody some of the promises of online journalism. For instance, two of the problems journalists routinely face are addressed by hyperlinking: "the first is the question of how much of the previous day's events need to be recapped in today's story. On the web, the journalist could link to yesterday's news and dispense with a background paragraph. The second benefit concerns alternative points of view, those that are often excluded in favour of more mainstream views" (Tremayne, 2005, p. 31).

The added value of links resides thus firstly in the ability to refer to a greater context and to improve or restore transparency as well as credibility (Tremayne, 2005, p. 32; Tsui, 2008, p. 70). By stating this, one agrees with the assumption that the process of sourcing is what defines journalism (Tsui, 2008, p. 71), and that it must be supported by facts in order to be credible. Hyperlinks might "direct readers to additional sources of information" (Dimitrova, Connolly-Ahern, Williams, Kaid, & Reid, 2003, p. 402) that provide facts and context to back a news story without weighing it down. Concretely, linked documents could be other related articles, or background about the major figures or events mentioned (Franklin, 2005, p. 105). "The technology of the web allows news presentations that might satisfy both those wanting shorter fact-driven accounts and those wanting context, interpretation and opinion" (Tremayne, 2004, p. 238). Added value would also lie in the prospect for journalists to echo multiple points of view, embodying the "myth of online journalism", characterized by Domingo as a "program for creating a more transparent, comprehensive and dialogical reporting that would strengthen democratic participation in plural societies" (2008, p. 683). An additional advantage of hyperlinking takes the shape of reciprocity, as "important commercial concerns regarding reciprocal linking may guide news web sites" (Tsui, 2008, p. 75). Some authors also underline the importance of hyperlinks in the process of gatekeeping. A gatekeeper is "an individual who filters out and disregards unwanted/uninteresting and/or unimportant information or stories and attends to information of more import" (Franklin, 2005, p. 92). By allowing news providers to suggest which voices are worthy of attention (Tsui, 2008, p. 71), hyperlinking is "perhaps the most significant mechanism of online gatekeeping" (Napoli, 2008, p. 63). "The decision about which hyperlinks to include in web news stories and which not to include constitutes an additional gatekeeping decision made by web news editors" argue

Dimitrova et al. (2003, p. 402).

In sum, hyperlinks improve online news by providing context and credibility; by allowing multiperspectival journalism; by initiating links likely to be reciprocated; and by strengthening the process of gatekeeping.

However, despite those appealing promises, news websites seem to have failed, so far, to fully embrace hyperlinks. Empirical research has revealed an overall lack of hypertextuality in online media (Oblak, 2005), and when linking was observed, it sparsely led to external sources (Dimitrova et al., 2003). Far from the idea of openness included in the "emergence of a new form of news perhaps best described as contextualized journalism" (Pavlik, 2001, p. 217), news websites mainly point to internal resources. In that sense, they have been characterized as "gated cybercommunities" (Tremayne, 2005) or "walled gardens" (Napoli, 2008).

The promise of a journalism that would be improved by hyperlinks nonetheless survives, maybe reinforced by the rapid development of the so-called *web 2.0*. Commentators have been calling for the advent of "link journalism", made easier thanks to new tools such as the microblogging site Twitter (Karp, 2008), social bookmarking or collaborative filtering platforms. Similarly, some have argued in favor of "networked journalism". For example, Charlie Beckett is claiming that it creates quality by adding value to the news in three ways: editorial diversity, relevance, as well as connectivity and interactivity (Beckett, 2010). Further evidence that hyperlinks are still fashionable for news media can be found in the recent BBC policy shift. The March 2010 document entitled "Putting quality first" specifies a very concrete goal: "turning the site into a window on the web by providing at least one external link on every page and doubling monthly 'click-through' to external websites" (BBC, 2010, p. 4).

Always oscillating between hope and disenchantment in making journalism better, hyperlinks epitomize what is at stake for online news in digital societies. Hyperlink maps of news websites therefore constitute a valuable tool, if only to facilitate the distinction between wishful thinking and real practices, between fantasies of online news prophets and the materiality of the networks we can observe.

Methods and tools: getting hands-on

If the interest of mapping the hyperlinked environments of news websites has been established above, the researcher nevertheless faces an important question: how to proceed? For this research, two tools were tested, namely Navicrawler and Gephi. The former is a "tool for exploring the web, that analyses content and structure of pages and hyperlinks (…) it mixes a browser and a crawler" (WebAtlas, 2009), while the latter is a graph exploration and manipulation software. Both are open-source projects, freely available. The territory to be explored is the Belgian online news landscape; with a simple, yet compelling, research question: what do Belgian online news outlets link to?

This section will not elaborate on Gephi, the visualization tool, which is designed for handling complex networks and therefore works flawlessly once fed with a well-conceived corpus. The collection of data and the composition of the corpus with Navicrawler, however, are more complex operations. The process of assembling data is nonetheless not completely disconnected from visualization. Frequent iterations are needed, between the websites likely to be added to the corpus and the first graphical overviews of the network. The process could even be considered as threefold, as it is often useful to look at the data in the form of spreadsheets.

The collection process *per se* was elaborated along these lines: (1) opening the homepage of a news website in Navicrawler; (2) collecting all the hyperlinks on that page; (3) browsing all the internal links found on the page (i.e. going one level deeper into the site); (4) browsing all external links found; (5) while doing this, a first categorization emerges, and tags are attributed to each site; (6) in the process, other news websites were identified, which can be used as new starting points for data collection (snowball sampling). So, the data collection is divided into two essential, concomitant operations: deciding what to include in the corpus and what to exclude from it; and classifying the selected websites. This raises a number of methodological concerns.

The first set of issues is connected to the question of where to stop. In this case, the corpus is bound by pre-defined limits: Belgium-based websites, only homepage and first level pages (linked on the homepage). But other criteria are more problematic, namely that of deciding whether a particular links leads to a website likely to be considered as significant in the corpus – as opposed to non significant links such as those stemming from advertisement banners, which are not picked by journalists or even by webmasters and therefore reflect a different linking policy. The case of news websites is more ambiguous than other mapping attempts (Ghitalla et al., 2006; 2005; Highfield, 2009) because the field is not thematically focused. When mapping a thematically coherent domain, such as literature or political blogging, the researcher must decide if the websites he encounters belong to the domain or not. The main difficulty resides in the fact that other nearby domains might be close and sometimes intertwined with the territory being mapped. News websites are thematically open, and the decision to include or exclude a website from the corpus must be based on other criteria. As the research question leading this exploration is open (what do the news websites link to?) and

aims at taking stock of the situation, most of the linked websites were included, except the broken or unattainable links (e.g. those leading to pages requiring a login and a password). For instance, even the sites belonging to the "upper layer of the web" were kept, whereas it is commonly recommended to exclude them (Jacomy & Ghitalla, 2007, p. 6). The upper layer of the web is composed of very generic sites such as search engines or portals. They represent dead-ends for thematic explorations, because they are nonspecific and offer too many links, which lead to dispersion. Yet in this case it seemed relevant to keep them in the corpus, if only to examine the potential domination of those web giants in the Belgian online news environment.

The second main operation, sorting websites, also requires methodological questioning. The flexible way of tagging and categorizing on Navicrawler encourages emergent classification. Rather than pre-establishing categories, the research started with loose ones, which have become more refined along the exploration. A view of the corpus as a table allows to keep a global overview of the work-in-progress classification, and temporary visualizations of the graph open onto the detection of phenomena needing more sophisticated tagging. The absence of thematic coherence also implies impediments, as news websites can virtually link to anything. Categories do therefore not rely on the content of the linked sites, but rather on more general features likely to cross the whole corpus, such as web genres.

The main issue here is the stability of the corpus, with news websites being especially sprawling and constantly evolving. The method described below allows seizing a snapshot of the news sites environment, which could lead to more exhaustive or time-sensitive investigations.

Results: the hyperlinked environment of Belgian news websites

Thirteen Belgian news websites were explored following the method delineated in the previous section (they will be referred as "source sites" below). The resulting network is composed of 548 nodes (i.e. sites) and 1848 edges (i.e. hyperlinks). The source sites were not picked in advance as representative of the Belgian news landscape, but discovered during exploration, starting from the leading French-speaking news site (lesoir.be). As a result, thirteen source sites were included and further investigated. They offer a nearly exhaustive coverage of the Belgian generalist news websites, with the noticeable exceptions of deredactie.be (news site of the Dutch-speaking public broadcaster) and rtlinfo.be (news site of the private French-speaking broadcaster), which are absent because no other website linked to them at the time of our analysis.

Figure 4 shows an overview of the network, with the source sites in red and the other sites in light green. The size of the nodes depends on the number of outgoing links: the more it links to other sites, the bigger a node is. Some links are grouped on the outer circle of the map, whereas others are central. Islands on the edges are sites only linked by one of the source sites, which means that the source sites both share a part of their links and have links specific to them.

Zooms on subgraphs are needed to better understand the essence of the network, as the global view is intricate and difficult to read. For example, an important portion of links leads to media websites, such as international or local news sites, or the corporate showcase of traditional media companies. The subgraph containing those sites and the source sites is composed of 84 nodes and 234 edges. When adding pure-players, i.e. news sites not affiliated to a traditional media organization, and other sites directly related to professional media – such as journalists union, media regulation organisms or portals promoting the press – the subgraph comprises 117 nodes and 329 edges (Figure 5 where some URLs are displayed as examples). In this case, the size of the nodes depends on the ingoing links (the more a site is linked to, the bigger the node), and can be considered as a rough estimation of the sites' authority in that particular subgraph. The biggest node on this graph is the CIM the Belgian body responsible for measuring media audience and circulation. Its dominant position can easily be explained by the affiliation of all major websites to the CIM for the measurement of the traffic on their pages.

This abundance of links to other media websites go against the assumption that "a standard argument against providing external links is that readers may never come back to your site" and that "the unwillingness to give up control of the visitor's news experience explains the lack of hyperlinks to outside websites" (Dimitrova et al., 2003, p. 409), all the more so as linking to friend or partner media, e.g. owned by the same news organization, does only explain a small part of the links.

Another noteworthy set of links consists of resources specific to, and centered on, the web. These are search engines, social networking sites, file-sharing platforms, open-source portals, RSS feed readers, aggregators, etc. Some of those links are present to offer useful functions to the reader (search or personalization), while others aim at encouraging visitors to share with their social network and give visibility to the content offered. The subgraph (Figure 6) counts 66 nodes and 187 edges. The dominant sites are giants of the web industry, such as Facebook, Google, Youtube or Twitter – at the expense of competitors such as Yahoo (3 links) or Netlog (1 link).

An additional group of sites prompts curiosity: links that do not propose additional informational content, but redirect the

user towards sites of practical utility. Concretely, these are links to e-commerce platforms, to general service-providing sites (weather forecasts, job ads, train schedules, e-booking, etc.), to sites related to leisure (travel agencies, amusement parks, tourism-related resources), or to the showcase sites for brands or cultural institutions. These links, however, do not stem from advertisements: they are part of the sites' content. For example, links to the official websites of Xbox and Playstation are found in the column "useful links" of an article on video games. Similarly, links pointing to the sites of Mobistar, Proximus and Base (mobile phone companies) originate from a page explaining how to use the mobile version of the news site. This subgraph (Figure 7) counts 169 nodes and 280 edges.

Along with the previously highlighted web-related resources, those sites trigger questions on the function of hyperlinks. For example, questions are raised regarding the use of product placement or the way media discusses brands. But above all, the nature of those links is challenging: they do not provide context or depth to news stories. They do not correspond, for instance, to the guidance on hyperlinks provided by BBC editor Steve Hermann (2010), for whom three sorts of links matter: source material for government reports or science papers, other related news coverage, and related commentary and articles. They do not lead to "browsing through reports, archives dating back years and years, official documents and full transcripts of interviews and statements", nor allow "the reader to trace back the reporting and news gathering process" (Deuze, 1999, p. 383). The links discussed here are different in nature, they are mainly practical and might come handy for the community of readers – emphasizing the role of media as community managers – but they do not seem to provide strictly *journalistic* content.

Finally, some of the source sites host blogs. On the global map, they have been considered as external sites – they often benefit from a specific URL – but it must be underlined that their status is hybrid. They do not belong to the media organization, yet they are somehow endorsed by it – with some blogs being written by journalists and others by unknown internet users. For a news website, blogs may represent an opportunity to get more closely connected to the rest of the web. The blog genre is deeply entrenched in a culture of links, and each blog is generally in liaison with other sites. For instance, Figure 8 shows the 104 blogs hosted by the French-speaking daily's website lalibre.be (in red), and the whole new universe of links they propose (830 nodes and 3551 edges in that graph). Therefore, sheltering blogs might represent a way for news websites to integrate into the link ecology of the web while keeping their distance, as the responsibility of linking is somewhat outsourced on blogs. The whole new possibilities of navigation are at the same time remote and close to the news websites' homepage – they are only one or two click away from it, but do not *exactly* belong to the content of the site.

Discussion, limitations and concluding remarks

Thanks to hyperlink maps, it is possible to highlight categories of links that challenge common conception about the role of hyperlinks in journalism. First, links to media and media-related sites have shown news websites as centered on their profession, and unexpectedly open to their competitors. Second, links to web-related services and practical information questioned the function of hyperlinks as added journalistic value. Altogether, those links roughly represent half of the global network. The other half still needs to be scrutinized and explained. Further research has to focus on refining the reflection on the nature of links as providing journalistic content or as carrying another function.

On a more general level, the hyperlink map has proven useful to stir questioning and to draw attention to interesting phenomena. However, limitations do exist and network analysts must be cautious. Firstly, hyperlink maps are not easy to decipher. Our intuitive urge to interpret elements such as orientation or distance must be restricted, because they don't mean anything in this context. When handling complex networks, an important pedagogical effort must be made in order to explain the map. Secondly, we should remain wary of the aesthetic appeal of the maps. They are indeed pleasant to look at, they look rigorous and sophisticated, but we must not use them when they do not add value to our analysis or illustrate it clearly. Thirdly, maps will never be self-sufficient: they have to be associated with other ways of presenting data (charts, tables, etc.) as well as with other ways of conducting research (for example, our investigation of Belgian news sites link policy could lead to ethnographic inquiries in the concerned newsrooms in order to confront the results with the journalists' practices). Finally, maps should not be seen as an objective picture of an unambiguously depicted situation. We must not forget that they are largely determined by the arbitrary construction of a research corpus. Similarly, visualizations are not neutral: zooming on a subgraph or highlighting a specific property is a deliberate choice that needs to be clearly stated.

Mapping hyperlinked environments therefore constitutes a challenge, drenched in the enthusiasm stirred by new and not well-tried experimental tools. Methods for mapping still need to mature, but they nevertheless represent thought-provoking ways of exploring a set of objects. Their complexity, immateriality and pace of change require powerful tools and innovative methods.

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Appendix: figures

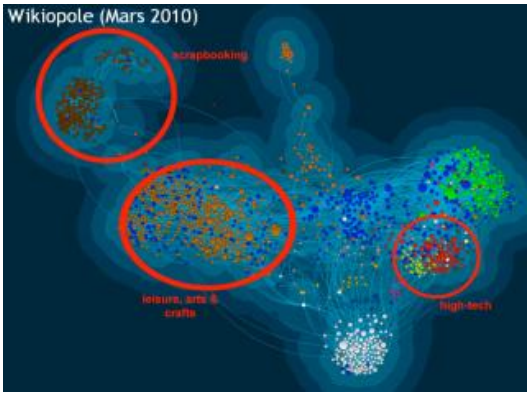

Figure 1 - Wikiopole

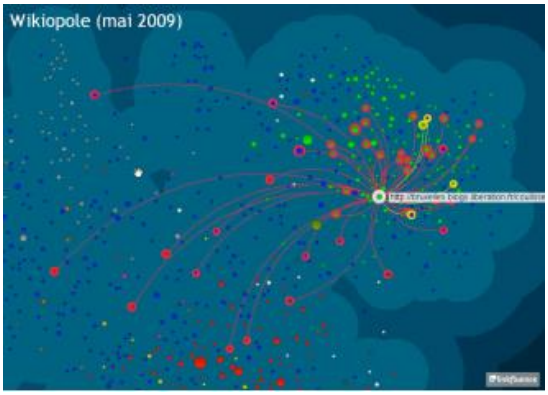

Figure 2 - Les coulisses de Bruxelles in Wikiopole

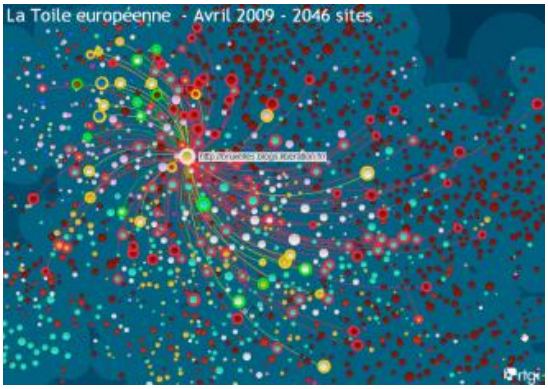

Figure 3 - Les coulisses de Bruxelles in the European web

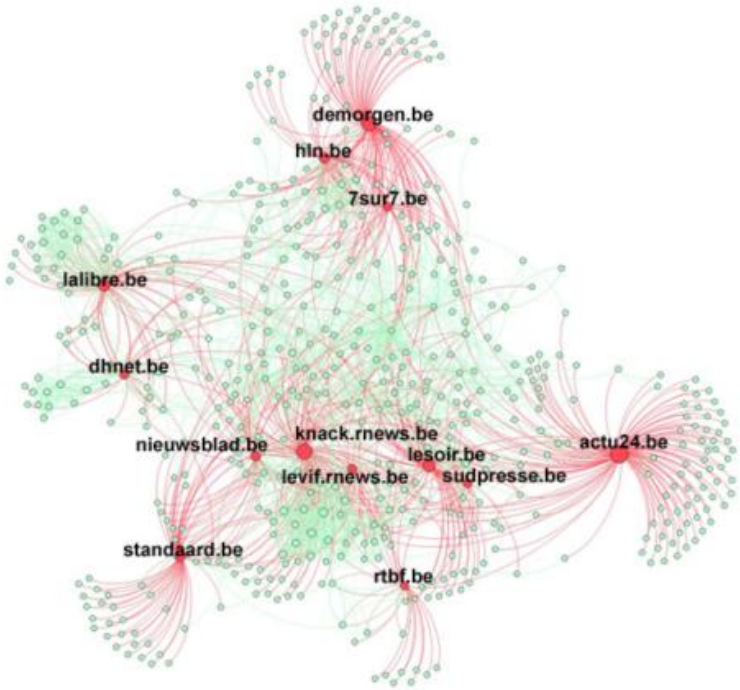

Figure 4 - the whole network

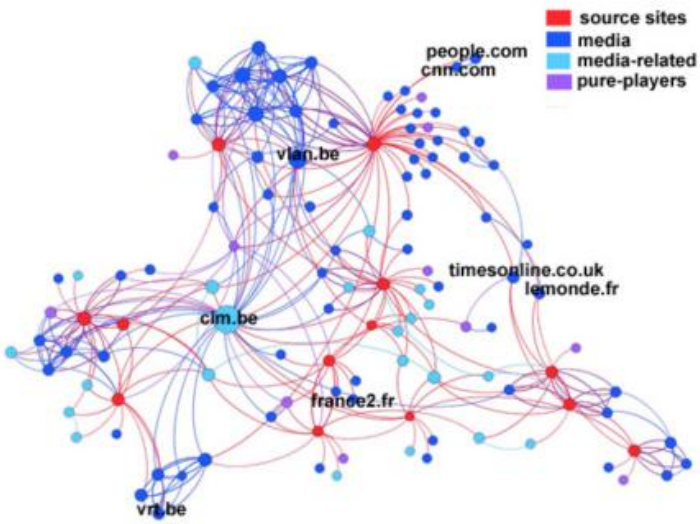

Figure 5 - media subgraph

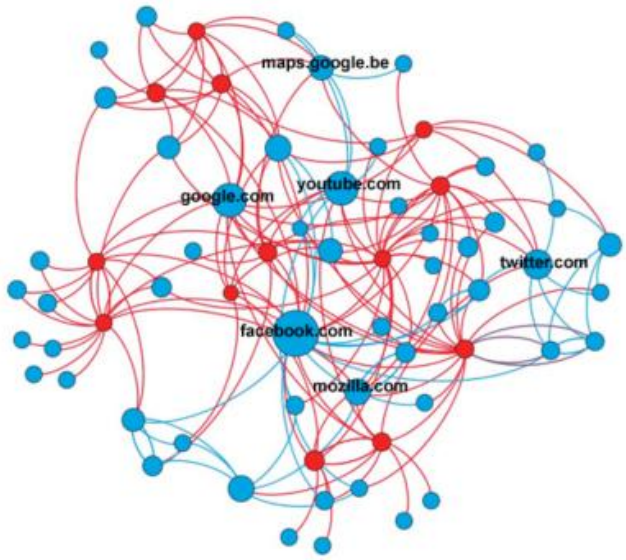

Figure 6 – web-related resources

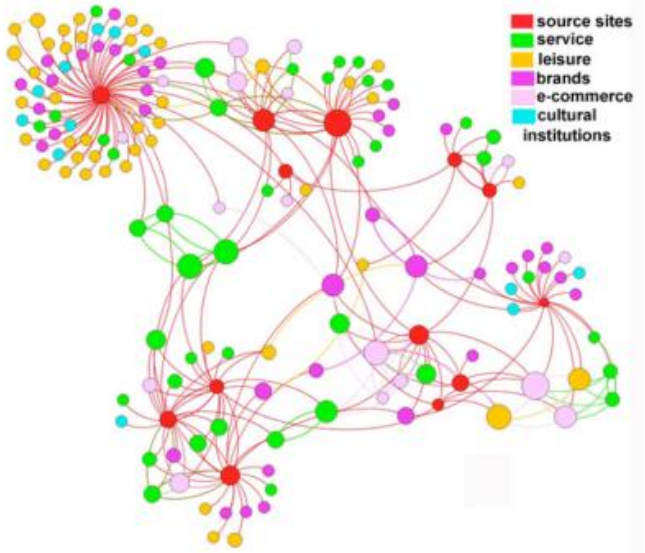

Figure 7 – links to sites not providing additional journalistic content

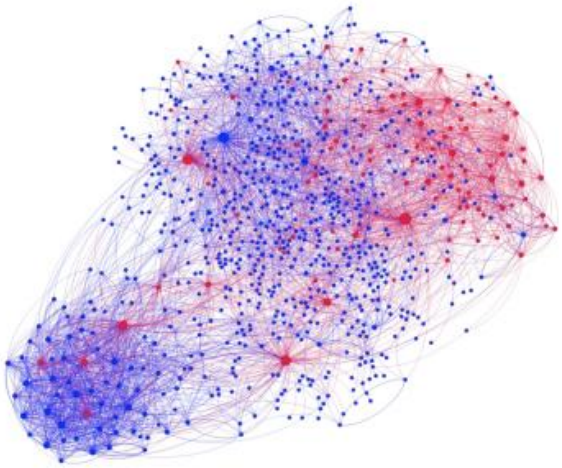

Figure 8 - network around blogs hosted by lalibre.be

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Section 5

Hypertext Newswriting Effects on Satisfaction, Comprehension and Attitudes

ORIGINAL ARTICLE - ISOJ 2008

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More than a decade after the beginning of online journalism, the great expectations of this field of expertise remain unfulfilled. Hypertextuality, multimediality, and interactivity remain original marks as yet unexplored by journalism made on the web (though not for the web). In the specific case of hypertextuality, the subject of this study, its little use is linked with journalists' time constraints, the absence of an organizational model not limited to copying printed papers, and the fear that readers may reject non-linear reading (Paul, 2005). The latter reason is likely what is most hindering the evolution of web journalism, despite the great potential of online news formed by networks of linked texts. To begin with, it frees the reader, giving them the option to create their own path of reading. Additionally, it offers extra contextual information about the subject, allowing readers to increase their knowledge on the subject according to their own interests. Despite the apparent advantages, such textual networks demand an additional effort of readers to interact with the theme. They must follow links, and skip from text to text, which may be perceived as obstructive to their reading. The passivity imposed by the most powerful medium, television, and the recipients' deeply-rooted habit of linear readings raise an important question: Will readers value the hypertext contexts to such an extent that they will make that additional effort, or are the newspapers right in their fears of the reader's reaction? In an attempt to answer this question, an experimental study was carried out assessing the effects of hypertext on levels of satisfaction, perception, comprehension, and attitudes of online newsreaders. Two news articles with the same contents were created; however, they were presented in different formats: one with the traditional layout - printed news (single text), and the other an assemblage of different texts connected through web links. Two test groups, formed by students, read each of the online news and answered the same survey immediately after the test. The data, statistically treated using SPSS, allow the conclusion that there is a significant difference between groups in some of the surveyed items, and favor the hypertextual online news.

Hypertext is in this study is understood as a non-linear interactive text, having as only support a computer (Nelson, 1980). A subsequent definition defines hypertext as a group of documents, presented on a computer monitor, linked through database objects through a mouse click (Conklin, 1987). This latter definition reveals a shift towards the idea of the hypermedia document as a hypertext linking information blocks with different kinds of media content (Nielsen, 1995; Hardman & Sharratt, 1990).

The previous definitions indicate that hypertext represents a major contribution to research developed by web journalism. Its power is felt throughout all fields of web journalism because it interacts with both the language and the way the readers interact with the contents.

This characteristic is particularly important as it highlights a crucial distinction in relation to the printed press news – not merely because it is hypertextual news, but because it elicits direct action from the readers, such as clicking on the hyperlink of a word or image. From the moment the reader takes action, the comprehension of the contents becomes individual: they have made a decision based on their own perception, thus creating a personal reading sequence that does not necessarily match choices made by others.

The hypertextual news writing technique is presented as liberating both for readers and journalists at the same time. It obliterates printed text linearity and the notion of a single, isolated text, allowing both the reader and the writer more freedom (Landow, 1995). This interpretation of hypertextual meaning stresses the need of action by a dynamic reader. By choosing a specific path of reading, this reader creates temporal sequences, changing the course of the description. Hence, this type of text can be viewed as having multiple authors, without a predefined beginning or end.

This notion concurs with Roland Barthes' (1970) definition of ideal text, later reinforced by Pierre Lévy (1993), when referring to groups of information items - texts or images - connected through links that allow a reading as complex as the possibility of choosing different reading paths. This idea of hypertext, now applied to journalistic practice and followed by other authors (Hall, 2001; Noci & Salaverria, 2003), is the subject of the present paper.

This intricate network of texts and links allows an infinite number of architectures (Theng, Rigny, Thimbleby &Jones, 1996), thus compelling hypertextual writers to map out a previous draft of the system, a contents guide player, and to mark its affinity with similar subjects available on the web. Free navigating, in an almost endlessly generated information network, creates a dynamic memory. This memory mimics human memory, which is based on the association of elements with shared characteristics. Those elements are information groups (text, image, sound or infographics) and their association is achieved through links.

In addition to the materials – information groups and links - the productions of a web news story must follow rules that are necessarily different from the ones used for the writing of printed news. By using a different media support from the printed press, web journalism must devise its own features or it will be doomed to failure (Pisani, 2001). Thus, the web news develops through an architectural chain of information groups linked together, the latter accomplishing two main aims inherent to its documental and narrative functions (Salaverria, 2005).

1. In their documental function, links offer the choice of building a potentially infinite web of information. The use of this type of connection allows the creation of news with different reading levels. More demanding readers may add to their knowledge of a specific subject, skipping from information group to information group until they attain deeper levels. In turn, busier or less demanding readers may access only the essential data by interacting less with the content and attaining only a superficial level of understanding. Thus, the variability of this function is essentially the quantity of information.

2. The narrative function is associated with the potential of creating reading paths. The most important thing is the way in which the user reads the web news story, not the quantity of information on a given event. This will depend on the journalist's link policy. The way in which the journalist links the groups of text, which in turn governs the nature and meaning of the narrative when restricting the reading paths (Hall, 2001). This implies that when writing a web story, the journalist must manage at least three new variables, which are: i) Criteria inherent to the allocation of information in groups. ii) Group distribution though different levels of reading. iii) Choice of key words.

In regards to the edition, the management of the resulting variables inherent to both functions affects the editing of hypertextual writing. On the other hand, another variable on the users' part must be considered: a linear reading tradition over four thousand years old.

Indeed, linearity is one of the strongest features of the printed word; in the West we acknowledge that the text sequence has a predefined meaning and that the pages of a book or newspaper always follow the same linear organization. We know that letters joined together from left to right create words, and that these, joined together in the same direction make up sentences, that give form to paragraphs, which together are chapters, which as a whole become a book.

When reading a text we are constantly seeking its meaning, searching for a link or association with what we have read before (Sperber & Wilson, 1986), i.e. we ascertain the meaning based on a logical link to ulterior linear parts. However, hypertext information is fragmented into autonomous components that generate a particular reading, regardless of the texts read before and of the ones, which will be read after (Landow, 1995). Thus we enter the field of non-linear textuality, i.e. of verbal communication objects that reach beyond the simple sequence of words, having the possibility of conveying different meanings according to the reading choices of the user (Arseth, 1994).

Only the beginning being chosen by the author, the text takes on the discontinuity of the digital worlds, which means each user chooses their own path of reading according to their interests (Holtzman, 1997). The shift in paradigm resulting from the non-linearity of the text and the freedom from previously defined reading paths may represent a potential difficulty for users, and therefore an obstacle for web newswriting using hypertext. It seems that an intuitive navigationsystem, simple and easy, is absolutely necessary to make the reader comfortable in the course of reading (Theng *et al,* 1996); and when feeling comfortable, readers will have a more gratifying experience. Research carried out by Berger (2001) identifies a positive correlation between hypertext reading comfort and user fulfillment. This comfort results from two factors: an intuitive navigation interface and the user's experience in reading hypertext.

The result is a group of users that present high levels of satisfaction and comprehension perception, evaluating positively the web news story in terms of accuracy.

However, though hypertext writing has great potential, it can also pose some difficulties. It is necessary to understand the best way in which to write an article for the web.

Method

An experimental study was carried out with two random groups of 25 participants each. An independent variable was manipulated. One group received a particular treatment and the other received an alternative treatment and served as control group. To ensure the internal validity of the investigation, after a random distribution of the participants between

the two groups, a questionnaire was distributed to assess the balance between groups, eliminating any eventual rise of contaminating variables.

Participants

Having first been established that all computers had the same technical features, a room was then equipped with 25 computers. It was explained to the participants that this study was related with journalism; therefore they should read the news in their usual way.

After reading, all participants filled in a questionnaire, stating socioeconomic details (such as age and sex), Internet habits (e.g. years of use, daily time of use, places where connection is established, internet services used, percentage of news usually read in the internet) and online reading habits. The balance of the experimental groups was assessed through analysis of these questionnaires, an essential condition to ensure the internal validity of the study.

Dependent measures

Attitude regarding the journalistic product

Since the web news story has different features from the ones usually found in online newspapers, it was important to understand the participants' opinions as to the proper use of language and the medium. Thus, 10 statements were presented to the participants: 1. The story was produced in accordance with the medium (web); 2. The language used is innovative; 3. The design is adequate; 4. The structure of the piece is user-friendly; 5. The news design is innovative; 6. The language used is appropriate for the web; 7. The navigation system is easy to understand; 8. This language fulfils my needs; 9. The option of choosing reading paths is positive; 10. The language enhances the contents.

The ten items included in this variable were related to three attitude types: innovation, adequation, and expectations regarding the media. Thus the fragmentation of the attitude variable in more than one factor was expected in certain situations.

- *Innovation* (items 2 and 5): When giving high scores to these items, the participants consider that the contents add something new to the information they know and are familiar with.

- *Adequation* (items 1 and 6): High scores show coherence between content and the medium (web). In this case participants found the language to be in agreement with the medium's characteristics, a crucial factor in this line of work.

- *Expectations* (items 7, 9 and 10): The participants' high expectations concerning content indicate a predisposition to interact with that same content as it affords a sense of gratification. That is attested to when scoring high on these three items.

Perception of theme comprehension

The word comprehension implies that the recipient is able to extract from the message the meaning intended by the writer. Measuring comprehension would imply using research techniques especially designed to determine variables such as memory. However, it has been proven that previous knowledge of certain matters increases the comprehension levels of the news, influencing the results (Van Dijk, 1990). As such, it could jeopardize the internal validation of the results. Thus, in this experiment it was decided to measure the perception of comprehension, in an attempt to understand how the reader has the notion of having understood the message.

In order to assess the perception of comprehension 5 statements were used: 1. How did you understand the news?; 2. The information is easy to understand; 3. The news has sufficient information about the subject; 4. The news is presented in a clear way; 5. The news is sufficiently detailed.

The items that form this variable are divided into two groups, one that directly inquires on the perception of comprehension (1, 2, 4) and another that addresses in greater in-depth the participants' notion that the news has been sufficiently explored to provide a wide-ranging outlook of the issue.

With this subdivision, two new factors were possible: comprehension perception and contextualization (contextual perception).

The participants evaluated each item according to a 10-point scale, ranging from 1 (nothing) to 10 (everything).

Satisfaction

Satisfaction is an important concept in various areas of human communication, and particularly in the journalistic field. In terms of media communication, the term satisfaction can appear linked either to features or contents of the media. In this

particular case it was deemed important to know whether the independent variable has any significant influence on the different levels of satisfaction and gratification experienced by participants.

The assessment of satisfaction levels was undertaken using a survey with 5 statements: 1. In which way was the reading of the news gratifying? 2. In which way has the news increased your interest in the theme? 3. How did you like the news? 4. Did you think the information is relevant? 5. Did you feel involved in the content of the news?

Participants rated each item using a 10 points scale, ranging from 1 (nothing) to 10 (everything).

Data analysis

Statistical tests (student's *t*, variance analysis, and *chi-square* tests) were used and with the support of SPSS (computer software) they allowed the analysis of the differences between the two experimental treatments of the dependent variables.

The *Student's t* test is one of the tests most often used in experimental treatments with two groups, because it allows comparing scores (averages) on the independent variable of two homogenous groups undergoing two different kinds of treatment. In turn, the *chi-square* test allows assessing if the variables are effectively independent or if on the contrary there is an connection between them. Multivariate statistical tests (factor analysis) were also used in this study to simplify data reduction and the elaboration of indexes more suitable to the dependent variables considered.

Procedure

Fifty first-year Architecture students from Universidade da Beira Interiorparticipated in this study (average age 19,8 years old, 64% women).

Two news with the same textual content were prepared. One of them was written following the inverted pyramid technique and on the lead the six fundamental questions were answered: who, what, when, why, and how. Subsequently the theme was developed using independent paragraphs organized by decreasing order of importance.

The other news, a web news, used the same inverted pyramid technique. However, the information, which in the first version was presented in text groups separated by a title, was here replaced by information groups linked through words inserted in the lead text.

In order to avoid contaminating variables, the article offered a redundant navigation system, since it was also possible to move from group to group following links at the end of each news. These links were placed in words similar to the titles of the first version of the news (fig.1)

Fig. 1 – *News used*

The news theme was the fall of a plane in Peru. Besides the essential information presented in the lead, additional information (information groups in the case of the web news and subtitles in the case of the printed news) related with the heroic action of a flight attendant, probable causes for the accident, number of similar accidents over the last years, and the technical features of the plane involved in this accident were also presented.

In the latter case, the image used was the same, although in the hypertextual news it was presented as an autonomous group of information, while in the printed news it appeared at the end of the text.

Results

Assessment of the homogeneity of experimental groups

No statistically visible differences were observed between participants of the two groups, with the exception of the percentage of news read daily on the Internet. Though(t (48) =-1,907, p=0,063) is a minor difference in terms of group homogeneity, it must be considered in the discussion of results.

Attitudinal impact

The factorial analysis of the main component (with Varimax rotation) extracted two factors that together explained 60.5% of the variance. The first factor, formed by 9 items, explained 33.6% and the second, formed by 8, items, explained 26.8% of the variance.

Table 1 – *Attitudinal Factors*

	Factors	
	1	2
The story was produced in accordance with the media (web) (M=3,58 ; SD=1,108)	0,66	0,49
- The language is innovative (M=3,13 ; SD=0,937)	0,80	
- The design is adequate (M=3,24 ; SD=1,041)	0,30	0,57
- The news structure is agreeable (M=3,22 ; SD=1,130)	0,42	0,71
- The news design is innovative (M=2,85 ; SD=1,000)	0,70	0,32
- The language used is appropriate for the web; (M=3,80 ; SD=0,756)	0,43	0,66
- The navigation system is easy to understand; (M=4,36 ; SD=0,722)		0,83
- This language fulfils my needs (M=3,75 ; SD=0,934)	0,64	0,38
- The option of choosing reading paths is positive (M=3,81 ; SD=1,045)	0,53	0,45
- The language enhances the contents (M=3,44 ; SD=0,873)	0,77	
% de variance	33,68	26,86

With these results two variables were created through the simple addition of items with higher factorial charges. Later, the veracity of the referred indexes was asserted through the *Cronbach Alfa* coefficient. The results show that viability was adequate both to the first factor –innovation- (α=0,855) and to the second –adequation- (α=0,748).

Table 2 – *Impact on Attitudes*

	News with …				
Dependent variable	**Text**	**Hypertext**	***t***	***gl***	***p***
Innovation	3,06	3,73	-3,542	46	0,001
Adequation	3,31	4,00	-3,966	48	0,000
N	23	25			

Scale: from 1= totally disagree, to 5 = complete agreement.

The *Student's t* test was used to find differences in the two attitude variables regarding the version read. Significant differences between the experimental groups were found in the innovation item (t(46)=-3.542, p<0.001) and in the adequation item (t(48)=-3.966, p<0.000). In both cases the positive impact caused by the hypertext news was clearly noticeable, as it was considered the most adequate to the medium (M=4,00; SD=0,51) and the most innovative news (M=3.73; SD=0.54) by the participants.

Impact of the experiment on comprehension perception

The main component factorial analysis (with Varimax rotation) extracted two factors that explained 73.4% of the variance. The first factor, composed of 3 items, explained 43.9%; the second, composed of 2 items, explained 29.5% of the variance.

Table 3 – *Comprehension Perception Factors*

	Factors	
	1	2
How did you understand the news? (M=8,3 ; SD=1,56)	0,797	
The information is easy to understand; (M=7,88 ; SD=1,87)	0,936	
The news has sufficient information about the subject; (M=7,54 ; SD=2,29)	0,810	
The news is presented in a clear way; (M=7,48 ; SD=2,11)		0,849
The news is sufficiently detailed. (M=7,40 ; SD=1,94)		0,827
% of variance	43,91	29,55

With these results two variables were created through the simple addition of items with higher factorial charges in each factor. Later, the veracity of the referred indexes was asserted through the *Cronbach Alfa* coefficient. The results show veracity was adequate in both cases (α=0.805 y α=0.608, respectively). The items grouped in the first factor were mainly connected to comprehension variables, while the second were related to the contextualization of the event reported by the news.

Table 4 – *Impact on Perception of the Comprehension Variables*

Dependent Variables	News with …		*t*	*gl*	*p*
	Text	Hypertext			
Comprehension	7,12	8,69	-3,833	48	0,000
Contextualization	7,36	7,52	-0,325	48	0,746
N	25	25			

Scale: from 1 (Nothing) to 10 (Everything).

No statistically significant differences were noticed between both groups (t(48)=-0.325, p=0.746. However, in the specific case of comprehension, significant differences were identified among the conditions (t(48)=-3.833, p<0.0), and once again the hypertextual reading group presented higher levels of comprehension perception (M=8.69; SD=1.12).

Experimental impact on satisfaction

The factorial analysis applied to the scale used to evaluate satisfaction extracted only one factor which explained 74.5% of the variance (α=0.912).

Table 5 – *Impact on Satisfaction*

Dependent variable	News with …		*t*	*gl*	*p*
	Text	Hypertext			
Satisfaction	29,20	33.76	-1,828	48	0,074
N	25	25			

Scale: from 5 (Minimum) to 50 (Maximum).

Differences between groups were also identified (t(48)=-1.828, p<0.074).

The group that read the hypertextual news presented higher levels of satisfaction (M=33.76; SD=8.09).

Discussion and conclusions

Although the author of hypertextual web news expects the user to navigate the contents in order to optimize the reading, it has been demonstrated that the way in which we surf the web is much more determined by our experience of the Internet than by our interest in the contents (Mitra, 1999). This idea supports the need to carry out this type of research, using homogeneous groups of participants, which apparently did not happen before. Although both groups of participants were homogeneous in terms of years of using the Internet, daily time of connection, and the way they read news, a difference was detected as to the percentage of news read daily on the Internet. This factor needs to be considered, as it was noticed that Internet experience is important in the way users navigate.

However, the impact on attitudes showed a significant difference in the innovation item, with hypertext participants considering the news read as novelty. This finding allows me to suggest that a high reading level of news on the web revealed by the hypertext readers group is a variable with no significant influence on the results, since these readers also usually read traditional printed news (i.e. not using hypertext). Little contact with hypertextual news might justify the association between hypertext and innovation, but this factor loses importance and balances out the results of both groups, cancelling the eventual contamination of results by a variable peripheral to the research.

One of the problems most often mentioned in studies on the use of hypertext (Batra Bishu, & Donohue,, 1993; Hammond *et al*, 1989; Marco, 2003) is the possibility that this type of content may create a sense of disorientation in users, a situation that could justify Lopez's (2003) view that users do not appreciate hypertext as much as is believed.

Admittedly, the lack of enthusiasm regarding hypertext may be related to the above-mentioned sense of disorientation, which might in turn suggest a certain degree of dissatisfaction with the reading. Nevertheless, the results of this study point in the opposite direction: though differences between groups are visible in relation to the impact on satisfaction levels, hypertext readers clearly showed a higher rate of satisfaction. This allows conceiving a news architecture with

high receptivity among users, which is relevant if we take into account that the search for journalistic information is one of the major motives leading users to navigate in the internet (Ko, 2002; Rubin, 1984).

An equally important data observed throughout this study was the difference between groups in the attitudes item. Users considered hypertext more innovative and particularly more adequate to the medium. This latter factor is important because if users perceive the message as adequate to the medium, then it can attest to the existence of a journalistic language appropriate for the web. The fact that the recipients ask for contents with specific characteristics is significant, as it reveals the existence of certain expectations, and thus, a predisposition of the user to seek certain contents.

However, we must not forget that the effectiveness of the message depends on the compliance with three basic rules: 1) The existence of a large amount of information divided into small groups; 2) The interconnectedness of these groups through links; 3) That at given moments in the reading the user needs only a small amount of information to understand the content (Marco, 2003).

This implies that, besides language management, the way in which the information is fragmented into groups and the type of links used must follow construction rules. In agreement with previous studies, these must have a coherence which influences the comprehension of the text (Thuring Hanneman, & Haake1995). The group of elements that make a text a logical unit is understood as coherence (Engebretsen, 1997). In the specific case of this study, global coherence was achieved, as significant differences between groups were perceived in terms of comprehension perception, and the hypertextual news was favored.

The data collected in this study suggest that when conforming to certain rules hypertextual writing has a significant impact on attitudes, on comprehension perception, and on the satisfaction levels of readers of web news. This set of rules, which can be considered as hypertextual grammar, must establish guidelines as to which words are to be linked (strong semantic relationship between word and content linked), how to link them (in the text or in a menu), and when to link them (where in the text).

Although the results were conditioned by the fact that the experiment was carried out in a laboratory with undergraduate participants, the results indicate that online journalism must turn to hypertextual writing to address the net information of consumer's expectations.

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Table of Contents