International Journal of Communication 6 (2012), Feature 2923–2938 1932–8036/2012FEA0002

special feature

The Future of Journalism: Networked Journalism

BREGTJE VAN DER HAAK
VPRO Television, The Netherlands

MICHAEL PARKS
University of Southern California

MANUEL CASTELLS
University of Southern California

Rethinking Journalism in the Networked Digital Age

In a technology-driven process of accelerated change, journalism is being transformed in the ways that it is produced, distributed, and used. We are witnessing the emergence of new tools and practices, phenomena that are yielding both a flurry of new ways to produce information and a redefinition of the place of professional journalism in this new information system. While there is widespread fear about the damaging consequences of these trends for the quality of journalism and the professional survival of journalists, we believe that current developments may, in fact, be paving the path toward better journalism and more independent journalists. The *what* and *why* of this statement are the subjects of this article.

In the digital environment in which journalists now work, new facts are being unearthed daily; more audience feedback is being integrated; more voices are being heard; more diverse perspectives on the same news stories are being presented; more stories are available, archived and searchable for longer periods of time; more men and women of power are being watched more closely; and more people are engaged more actively with the changes in the world—by taking photos or making videos of key moments, by commenting on blogs, or by sharing the stories that matter to them.

This dynamic landscape of continuous and diversified witnessing and reporting does not represent a crisis of journalism, but rather, an explosion of it. In fact, the profession seems to be more alive than ever and going through a multiplication of both forms and content at amazing speed.

If we journalists are in the business of gathering information, interpreting it, and spreading it, we certainly have more means than ever to do so. We are also getting more help, and for free, than we ever could have imagined. In an unstable and risky world, the public demand for information, analysis, and interpretation seems to be greater than ever.

So, *why* would journalism be in crisis?

The "crisis" in journalism seems to be mainly one of traditional business models for print and broadcast journalism (Garcia de Madariaga, 2008; Grueskin, Seave, Graves, 2011; McChesney & Nichols, 2010; Meyer, 2006). Since people can now choose to get the information they want from multiple sources, many of which are free, they opt less automatically and less frequently for newspapers and network television, and more often for online news, satellite, cable, radio, and their smartphones (see the Pew Research Center's *The State of the News Media* reports from 2012 and earlier). The willingness to pay for information has declined, and advertising is following readers, viewers, and users to the Internet (Gluck & Roca, 2008). Moreover, the once-broad audience formerly enjoyed by mainstream media is more fragmented, requiring media companies to customize their content or programming for niche audiences (Kaye & Quinn, 2010). This calls into question the business models based on selling advertising space in newspapers and on broadcast television (Arsenault & Castells, 2008). Faced with changing media use, media companies need to innovate to remain profitable, and some are failing because businesses largely have not done so (Mersey, 2010). So, there is, indeed, a crisis of the media industry, but not necessarily a crisis of journalism.

However, many journalists also feel that journalism is in crisis. Why is that? Competition has increased, and in an attempt to regain lost market share. Most media owners have squeezed news organizations to do more with less. As a result, working conditions for many journalists have deteriorated, and their workloads have increased. Multimedia reporting and publishing have become the norm without comparable investments in training or new staff. Most news organizations have actually reduced staff, requiring the remaining employees to multiply their output for the 24-hour news cycle and multiple platforms. Although more people are working as journalists than ever before, increasing numbers of them are not in traditional newspaper or broadcast newsrooms; instead, they work as freelancers, on websites, in advocacy organizations, and as public affairs practitioners (American Census Bureau, 2009; American Society of Newspaper Editors, 2010; Mandel, 2010). Furthermore, the stunning rate at which people have adopted mobile phones equipped with cameras has pushed citizen journalism to new levels and dramatically increased "competition" from unpaid sources in news gathering.

Although these developments present serious challenges to professional journalism, our analysis will separate the profitability crisis of media companies from the crisis of journalism itself. We are less concerned with the survival of traditional business models of journalism than with the continued and improved performance of journalism in the public interest.

Throughout the world, journalism is funded and sustained through a variety of financial models, including government license fees and taxes, philanthropy, advertising, subscriptions, pay-per-view, crowdsourced contributions, and mixes of all of the above. For example, the UK's BBC and Spain's TVE, the main television networks in these countries, carry no advertising and are funded with taxpayer money. Al Jazeera is paid for by Qatar's royal family; the fashion designer Miuccia Prada has floated the Italian communist newspaper *l'Unita* for many years; and most European broadcasters are funded with a mix of taxpayer money and advertising revenue. And the Internet provides new opportunities for advertisers,

media companies, hackers, document leakers, pirates and profit-seekers alike. All this is prone to intense experimentation and innovation. The question of who should pay for good journalism is one to be answered based on specific circumstances and possibilities.

Journalism as a Public Good

If we see journalism as a public good, we should look at the utility it offers society. Journalism does not have profitability as a primary goal, but rather, the production of reliable information and analysis needed for the adequate performance of a democratic society. As long as good journalism continues to be available, produced at lower cost (thanks to technology), and sustained by alternative sources of funding or produced through new business models, the crisis of the traditional business models of journalism will not affect the public interest overall, and journalism itself is not in crisis from society's point of view.

It is difficult to assess empirically the overall decline of the quality of journalism in the United States, let alone globally. There are many signs, however, that the squeeze on traditional news organizations and their journalists has resulted, in some instances, in the deterioration of journalism quality: fewer reporters on fewer beats, fewer new angles presented, fewer facts checked, and less inspired storytelling (Pew, 2012). If this trend were to continue, it would, indeed, constitute a crisis of journalism. Nevertheless, even if there is a decline in quality, the negative effect could be at least partially offset by new forms of journalism, such as citizen journalism and data journalism.

Although the discontent among traditional journalists is quite understandable (who wants to work more for less money and fewer readers or viewers?), it is sad to see many journalists close the door to new technological opportunities and refuse generous offers of active citizens, rather than taking the lead in new forms of collaboration that may produce better information for everyone.

In order to both break out of this defensive attitude and encourage journalists to experiment with new types of collaboration and technological tools, we have started to document and categorize some of the new technologically enabled practices in journalism, assessing them with the three key functions of journalism in mind: 1) Observe the relevant facts and ask good questions to the right people, 2) understand the observations and answers in context, and 3) explain these findings well to others. In the global network society, these could be summarized as 1) data collection, 2) interpretation, and 3) storytelling.

So, if journalism consists of observing facts and asking questions, understanding answers and explaining those answers to others, do we say that anyone practicing any of these is a journalist? Or is a journalist someone who masters and practices all three of those in sequence? We argue that, in the contemporary setting, anyone involved in any of these three tasks might be engaged in some form of "journalism," but he or she will usually not do it alone. As the data ocean expands and information becomes more complex, professional journalists will increasingly need to collaborate with both a variety of other professionals and citizen journalists to perform each of these three consecutive tasks adequately. Both specialization and collaboration will be needed to ensure the continued production of high-quality

journalism in the future. This leads to a broader definition of journalism, one which includes various new practices related to the production of meaningful information in the 21st century.

In this view, journalism is not just presenting the news (of the day or the week, of a city or even a country), but telling meaningful stories about what is new or is happening in the world, understanding it in context, explaining it to others, and making it available so others can use it (keep it, share it, remix it, and so forth) for their needs. Good journalists in the 21st century tell fact-based stories about the real world through text, audio, and visuals, stories which people can relate to, share, and appropriate. Journalism varies in form and perspective, and it includes radio and television reports, literary journalism, documentary films, photojournalism, data visualization, and more. Good journalism thus helps to create and strengthen communities, though increasingly these are communities of interest more than those of locale alone.

So if the journalist is no longer defined by his background, schooling, and salary, but by his practice and contribution to the expanding body of reliable information about the world, which new practices in journalism do we observe? We could start by looking for new practices in journalism in the following categories: data collection, interpretation, storytelling, and distribution.

In traditional journalism, the distribution of news stories is not considered a function of the journalist, but rather of the publisher, distributor, and marketer. However, as a result of the digital transformation of media, production and distribution are increasingly difficult to separate. When stories are reported and researched, written and produced, printed, broadcast, and posted in a networked way by a multiplicity of people in multiple places, the questions of who gets which story and how becomes a matter of concern for many journalists.

New Technologically Enabled Practices in Journalism

What are some of the new tools and technologically enabled models of journalism that contribute to the informational needs of citizens in the global network society? Some, but not all, are related to the Internet; some, but not all, are practiced by journalists. Others are practiced by designers, artists, researchers, programmers, filmmakers, hackers, bloggers, and photographers, as well as all those citizens who are contributing, usually without pay, to a growing archive of stories about the world.

New Tools and Practices in Journalism

What follows is a partial overview of some of these *new tools and practices*, something which offers possibilities of a new understanding of the profession: Out of new practices, we may be able to sketch the new identity of the journalist. The current challenge for journalists is to dare imagining what they could be in the future, instead of hanging onto the myths of their past.

1. *Networked Journalism*

Networked journalism refers to a diffused capacity to record information, share it, and distribute it. In a world in which information and communication are organized around the Internet, the notion of the isolated journalist working alone, whether toiling at his desk in a newsroom or reporting from a crime scene or a disaster, is obsolete. Every journalist becomes a node in a network that functions to collect, process, and distribute information (Beckett & Mansell, 2008; Jarvis, 2006). To some extent, a new professional figure has emerged, the networked journalist, as the subject of networked journalism. The role of the professional is still essential, both in going out to collect new facts on site, and in making sense of the information. There is still authorship of the report and the analysis, but it is driven by a networked practice dependent on sources, commentaries, and feedback, some of which are constantly accessible online. The actual product of journalistic practice now usually involves networks of various professionals and citizens collaborating, corroborating, correcting, and ultimately distilling the essence of the story that will be told.

Practices of sense-making are not usually distributed, however, even if they rely on networked information-gathering and fact-checking. There is a limit to Wiki-journalism. At one point in the process, there usually is a single, analytical voice—the voice of the author of the report, the teller of the story (not always one individual though, the author may be a team). The result of networked journalism is a multiplicity of authored stories.

To illustrate the notion of networked journalism, the following are three examples:

A. Deconstructing Foxconn

In China and Hong Kong, after the wave of worker suicides at Foxconn (Apple Inc.'s major contractor in the production of iPhones, iPods, and iPads), a collection of academics, journalists, NGOs, and students came into being and started to collaborate in a networked way to get reliable information about this giant company which employs one million people and closes its doors to journalists. Students in the network got summer jobs at Foxconn, collected information from the workers, and took photographs. The information and analysis was shared and could be used for individual "output stories" with permission of the network, including books, documentaries, and academic articles. For example, see *Deconstructing Foxconn*, a short documentary film by Jack Qiu.

B. The origin of the Tunisian uprising in December 2010

In the early moments of the uprising in Tunisia, Mohamed Bouazizi set himself on fire to protest a government bureaucrat's interference with his vegetable stall. This protest was captured on video with a cheap mobile phone and posted to a social networking site, though it did not "go viral," because such websites were blocked domestically. Instead, the video was picked up by Tunisians outside the country, including Sami Bhen Gharbia, who was scanning Tunisian Web content for political news and curating it on a site called nawaat.org. Al Jazeera got the video from nawaat.org and broadcast it back into Tunisia. Tunisians, in turn, found out what was going on from Al Jazeera (Zuckerman, 2011).

C. Microblogs in China

In China, microblogs on Weibo occupy a place similar to that of individual feeds on Twitter, which is blocked, as they are useful for sharing information and spreading it fast. With its rapid growth, microblogging is also becoming a kind of citizens' press agency through its role in drawing attention to corruption and scandals involving public officials.

2. *Crowdsourcing and User-Generated Content*

Crowdsourcing extends beyond citizen journalism and covers a wide range of practices that make use of collective intelligence to gather and check information, tell stories, or make choices in news production. User-generated content refers to photographs, video, textual comment, and other material provided to a news organization or news website by members of the public.

The unearthing and collecting of information by citizen journalists exponentially increases the ability to know multiple dimensions of an evolving reality, on a global scale, with local specificity. However, all these pieces of information require fact-checking, filtering, and above all, interpretation and analysis to create meaning, though some of these processes are crowd-sourced as well. Indeed, in a situation of endless streams of distributed reporting, the added value that professional journalists can provide is their capacity to integrate information, provide context, and make sense out of the information collected.

Many news organizations are already involved in crowdsourcing and integrate user-generated content in various ways, though the **BBC** and ***The Guardian*** have led the way in particular. The BBC has experimented with crowdsourcing at home and frequently around the world. Its user-generated content desk in London is probably journalism's largest and most active. Silvia Costeltoe, a senior broadcast journalist at the BBC's UGC hub, shed light on the practice:

> The wisdom of the crowds must be a part of all journalism right now. It is not new; it grew to what it is now. Everyone here [at the BBC] is very keen to use these extra sources. . . . We never run with a source unless we have second checked. Crowdsourcing is one of the many factors that make a story. We use every social media outlet to find sources and track stories. You should always have journalists out on the ground. If I see someone writing on Twitter: "There are new riots in Hackney" and if I publish that on the BBC Twitter, that is too easy. If I see the same comments on other social networks, I double-check it and send a reporter out. That is using social networks in the right way, I think. (Costeltoe, 2011; see also http://www.bbc.co.uk/journalism/blog/2011/10/ten-things-european-public-ser.shtml)

The BBC also experiments with crowdsourcing in other ways, e.g., to double-check claims by a mobile phone operator about its coverage areas (Wakefield, 2011). *The Guardian* makes weekly story lists

publicly available and invites comments from readers about stories its reporters are working on (see http://www.guardian.co.uk/help/insideguardian/2011/oct/10/guardian-newslist).

Another organization doing notable work with user-generated content is **Al Jazeera**. During the 2009 conflict between Israel and the Palestinians in Gaza, Al Jazeera invited viewers to upload their own photos and videos of the Israeli attacks on Gaza and offered the footage free of charge with a Creative Commons licenses to provide a crowd-sourced Arab alternative to the well-funded, top-down media strategy of Israel. The pan-Arab broadcaster also maintains a general repository of video footage produced by Al Jazeera and made available via a Creative Commons 3.0 license, enabling remixing and further distribution by users (see http://cc.aljazeera.net/content/launch-press-release).

NOS, the Dutch public broadcaster, is crowdsourcing news stories with its NOS Net. The project's leader, Bas de Vries, remarked thusly:

> NOS Net is a network of people who share their knowledge and experience with the journalists at NOS. The project is created because the journalists realized that on almost every topic, non-journalists may know much more than they do. In this social media era, we can connect to people who are not journalists very easily and start a dialogue. We call them our "news partners." They are are just one mouse click away. . . . We want to create a pool of knowledge. We as journalists can benefit from it but the public too. We want to give as many different views on a topic as possible, both in The Netherlands and abroad. (de Vries, para. 1–6)

Crowdsourcing is sometimes also used in a Wiki-style fashion to write news stories or edit audiovisual news stories through online editing software, such as at Stroome.com. Another use for crowdsourcing is to fund journalism projects and decide on which stories should be reported and written when funding is limited. Two leading American examples are Spot.us, a website for community-funded reporting, and Kickstarter.com, a more broad-based community funding site.

3. *Data Mining, Data Analysis, Data Visualization, and Mapping*

Colossal digital data sets are now available as a source of news and analysis, and data can also be the tool with which the story is told—and sometimes, it is both. Journalists can better navigate in the ocean of information with the help of programmers, designers, and hackers who are more skilled at uncovering and penetrating digital information. Faced with large data sets, journalists can add analysis, context, explanation, and storytelling. WikiLeaks is an obvious example. Of course, the liberation of data and the continued unobstructed access to digital information is of vital importance for the survival of journalism as a public good. Journalists need to either be more educated in data retrieval and analysis or collaborate with experts.

Some social science skills are also needed for journalists to handle increasingly complex information (Patterson & Lehman, 2012). The more we live in a context of abundant information that is

meaningless until treated and conveyed, the more journalists are essential as intermediaries between data, information, knowledge, and social practice. But they cannot do it alone. Should journalists become social scientists? No, because unlike social scientists, journalists are storytellers, and their target audience is not one of colleagues in the scientific community. The job of a journalist does not end with knowing the facts and analyzing them. Storytelling coupled with analytical capacity is key. Data visualization is a key component of storytelling in a digital age. Graphic design, data mapping, and interactive graphics are essential components of conveying information.

The Telegraph in London offered a prime example of this. *Telegraph* journalists used moderately sophisticated software to find connections among hundreds of thousands of documents when the newspaper obtained copies of expense reports by some members of Parliament and showed how they were abusing their allowances to buy second homes, pay personal expenses, and duck taxes (see http://parliament.telegraph.co.uk/mpsexpenses/home). When Parliament released all MPs' expenses in response to the public outcry—a total of 458,832 pages of documents—***The Guardian*** posted them on its website and invited everyone to investigate his own MP's expenses, and 32,755 people did so (see the project's continued growth at http://mps-expenses.guardian.co.uk).

An example in the American press is Adrian Holovaty's use of programming to automate the gathering and combining of information from local government, police, and other civic sources in Chicago, first for ChicagoCrime, and now for the local news aggregator EveryBlock (see www.holovaty.com/writing/chicagocrime/tribute and http://chicago.everyblock.com). Sweden's **Gapminder Foundation** is a "fact tank" that promotes a fact-based view of the world. Founded in 2005 by Hans Rosling to promote the UN Millennium Goals, it develops tools to communicate statistical information in visually enticing and convincing ways. According to Rosling, "The [Trendalyzer] software unveils the beauty of statistical time series by converting boring numbers into enjoyable, animated and interactive graphics" (2011, para. 4). The current version of Trendalyzer has been available since March 2006 as Gapminder World, a Web service displaying development statistics for all countries. In 2006, Google acquired Trendalyzer from the Gapminder Foundation (see http://www.gapminder.org/about-gapminder). Similarly, **Datablog** and **Datastore** at *The Guardian* also provide software for readers to make their own data-visualizations (see Rogers, 2011). The American effort **One Million Dollar Block** provides visualization of public expense on incarcerations per city block (Wagner, 2005, para. 1).

Other efforts have included the work of Laila Shereen Sakr, a doctoral student in media practice at the University of Southern California, who provided a running account during the Egyptian revolution using semantic analysis of **Twitter** feeds. Similar work has been done to assess public sentiments expressed on Twitter for the 2012 U.S. political campaign and, more lightly, about the Academy Awards. **Theyrule.net** aims to provide a view of some of the relationships of the U.S. ruling class by keeping track of board members of leading American companies. In her work ***NomadicMILK***, Dutch artist Esther Polak used GPS data to map the course of milk and the lives of cattle herders in Africa (Netherlands Media Art Institute, 2009). Earlier, she had shown out milk from Latvia wound up in Dutch cheese.

4. *Visual Journalism*

Video news is replacing text-based news as the main source of information for many people. Text, video, and audio sources are increasingly integrated in storytelling (Kuhn, 2011), and search engines based on visual matching rather than textual tags are becoming more refined. Visual literacy is important for journalists, and better understanding and use of images as carriers of information is needed. Digital interaction with visual storytelling is critical, both to engage viewers and to complement the reception of the visual message with self-reflexivity by the reader/viewer. Connected TV is the next step in the full integration of television, Internet, and mobile phones. Increasingly, journalism is visual and textual at the same time, integrating video sources in online news articles and extending television news into second screens and interactive documentary which offer related textual sources.

There are many examples of this kind of work. *Money & Speed: Inside the Black Box* (2011), an interactive documentary developed by **VPRO Dutch Broadcasting**, explores the future of finance and high-frequency trading in an iPad documentary incorporating a live data feed of share prices, written sources, and Web links (see http://itunes.apple.com/us/app/money-speed-inside-black-box/id424796908?mt=8). P*rison Valley* (Dufresne & Brault, 2011), about the prison industry, and *Gaza/Sderot* (2009), about two neighboring cities in Gaza and Palestine, are among the first interactive Web documentaries produced by the French/German broadcaster **ARTE**. **The National Film Board of Canada** has been very active in supporting the development of interactive multimedia documentaries by journalists and filmmakers. One of their most elaborate projects is ***Highrise*** (n.d.), which "explores vertical living in the global suburbs" and combines radio, 360-degree photography, blogging, and filmmaking in one ongoing, expanding online project. **Storyplanet.com** is a Web platform for interactive visual journalism founded by professional photographers and journalists. It is open and provides tools and skills anyone who wants to tell a good visual story (see http://www.storyplanet.com/about).

5. *Point of View Journalism*

Multiple versions of the same story are a natural fact of digital life, as different accounts and camera angles of almost any news moment are instantly available on platforms like YouTube or Flickr. Since most people are using multiple sources of news on multiple platforms, the presumed neutrality and objectivity of the journalist is increasingly difficult to maintain. For viewers and readers, it is easy to compare different stories and photos of the same event and spot the differences. It is simply assumed by these news consumers that all information is coming from somewhere and serving some interest. Formats offering multiple points of view on the same topic are perceived as authentic and popular with audiences worldwide (see, for example, the Middle East Broadcasting Center's *Kalam Nawaem*, Global Voices, and Metropolis TV).

Not objectivity, but transparency and independence are vital for journalism to be credible in the 21st century. Journalism with a clear perspective is more convincing than neutral narrative, and there is increasing value placed on the voice or vision embedded in the story—that is, on a point of view. This, however, calls for analysis grounded in reporting, not opinion or ideology. Although reporting may be

distributed, there is still individual analysis and individual storytelling. Here, the journalist retains value and builds on credibility and analytical capacity by being transparent about his sources and background.

Moreover, innovation in camera technology provides new camera angles. The miniaturization of cameras has enabled new forms of point-of-view journalism in reporting and constructing the story from a specific person's position inside a real life situation. Visual reporting is also technologically assisted by the shrinking camera (see the note above on Foxconn), while storytelling may use the whole range of digital effects and camera angles to increase the point-of-view experience of a news story. Similarly, innovation in 360-degree and 3D camera technology is providing both an increased sense of physical immersion ("being there"), and previously unavailable spatial points of view in visual storytelling.

Examples of these new approaches are found all around the world. The BBC experimented with war reporting with a point-of-view involving user-generated content provided by soldiers (see http://www.bbc.co.uk/journalism/blog/2011/06/our-war-use-of-the-soldiers-vi.shtml). CNN provided a 360-degree view of Haiti after the earthquake using a camera similar to Google's street-view camera (see http://edition.cnn.com/interactive/2010/01/world/haiti.360/index.html).

Canadian filmmaker Rob Spence, who lost his right eye in 2006, asked his friend and engineer Kosta Grammatis to develop a customized miniature camera to fit into his right eye socket. The camera attaches to a coupling device that was fitted into the socket after his natural eye was removed. The eye camera moves in tandem with Spence's remaining eye and sends pictures wirelessly to a monitor (see http://www.bbc.co.uk/news/health-14915281). Google Earth has added a perspective from above to the palette of visual journalism. The successful BBC television series *Britain From Above* (see http://www.bbc.co.uk/programmes/b00d23yx), talks about the country thematically, showing it only from above in aerial shots, zooming in and out like Google Earth and using data visualizations to tell the story.

The relatively new field of immersive journalism (de la Pena et al., 2010) incorporates virtual reality technology and "world building" for game design. It involves the creation of virtual realms based on factual reporting to do interactive storytelling with a point of view. The user is invited to participate in a computer generated re-creation of a factually reported news story, sometimes using an avatar (see https://iris.ucl.ac.uk/research/browse/show-publication?pub_id=270100&source_id=3).

Immersive journalism emphasizes the first-person experience in a news story, and it is especially useful when images are lacking because access is denied. It also provides added engagement and the possibility of reflection through interaction and choice-making for the user. For an introduction, see http://www.immersivejournalism.com; experience being a prisoner at Guantanamo Bay at http://spot.us/pitches/709-keep-guantanamo-bay-prison-open; walk around in a refugee camp in Darfur at http://www.darfurisdying.com; and take in reporting on the global energy wars at http://www.collapsus.com.

6. *Automated Journalism*

For the past three or four years, there have been crawler-type software robots that identify and retrieve press releases and news of different sources to integrate, package, and redistribute them to specific networks of information diffusion (e.g., www.narrativescience.com). Some business news organizations, such as Forbes, use these programs because the speed of information distribution is essential in globalized financial markets. There are also successful models for game coverage in sports (e.g., http//statsheet.com). And *The New York Times* uses what it calls "semantic Web technology" to compose, more or less automatically, the wedding announcements it publishes. In these cases, the analytical component of journalism is still present in the design of programs of content analysis that form the basis for each type of software. Yet clearly, the more automated journalism develops in the phase of data collection, the more journalists will have to specialize in interpretation, analysis, and storytelling.

7. *Global Journalism*

While broadcast networks and newspapers are closing foreign bureaus, new technology sustains the emergence of truly global sources of news based on multiple points of view and cultural diversity. Developments in translation software are supporting the circulation of news stories worldwide, and volunteer translation communities are doing the rest. A representative sampling would include Global Voices (http://globalvoicesonline.org), Global Post (http://www.globalpost.com), Metropolis TV (http://www.metropolistv.nl/en), VJ Movement (http://www.vjmovement.com/about), Associated Reporters Abroad (ARA; http://ara-network.com), Africa Interactive (http://www.africa-interactive.com), Chimurenga (http://en.wikipedia.org/wiki/Chimurenga_(magazine)), and the TED Open Translation Project (http://www.ted.com/OpenTranslationProject).

The European Broadcasting Union, which represents 85 national media organizations in 56 countries, is planning to acquire the .radio, or the top level domain name, for the global broadcast radio community to create an Internet-based platform where the world's radio broadcasters could assemble. The application for the new domain name has the support of the EBU's seven sister unions, representing the interests of around 50,000 radio stations with a potential reach of some 5.5 billion listeners.

Journalism at Internet Speed

The Internet and other digital networks have transformed the newsroom through global telecommunication networks with broadband capability, wireless communication, and permanent connectivity. There is a relentless flow of information that must be processed on the spot by constantly updating and rewriting the story. While working at Internet speed does not change the basic principles of journalism, it does make the reflective practice more difficult. The greater the volume of information to be scrutinized and the faster its input is demanded for news production, the less time is left for analytical treatment and storytelling. This development is changing the practice of many professional journalists and

puts tremendous pressure on journalism schools, whose graduates must be, at the same time, great multimodal storytellers, applied social scientists, and technologically savvy operators of sophisticated data systems. The issue is that very few journalists will be able to reach this new level of expertise in all of these fields. Therefore, they will have to specialize in certain subject matter or a phase of the journalism cycle, and then collaborate. If not, they will increasingly be losing the competition to the robots capable of performing routine data gathering, and to the citizen journalists who constantly retrieve information in real-life situations around them. The added value of professional journalists will increasingly be their analytical capacity and their ability to network. There will be more conductors of the informational orchestra than soloists of the news (Bozokswky, 2008).

Paradoxically, while the news cycle is speeding up, journalism is slowing down at the same time. Since news stories and television programs are now being routinely tagged and stored on the Internet, they are effectively becoming part of a worldwide digital archive. Many stories will be available for reference at any time in the future, accessible from anywhere in the world. In a split second, search engines regroup and pull up related information, both textual and visual, and provide customized information on any topic. This tremendously increases the value of journalism as a public good, since users are now liberated from the dictatorial, scheduled information flows and can access the information provided by journalists whenever and wherever they want. For journalists, this means that they are not only telling stories for tomorrow, but effectively, for eternity. The availability and searchability of journalism is especially interesting for educators, who can integrate the best pieces of analytical journalism in their courses. With time, the logic of the archive will further permeate the consciousness and work flow of journalists, and the tagging of stories, whether textual, visual, or audio, will acquire central importance (Anderson, 2006). Ultimately, much of the daily news will be automated (as is already happening with financial news), and journalists will concentrate on the interpretation, analysis, and storytelling of the slower and more fundamental changes in society.

In Conclusion: Back to the Future

Now, as in earlier eras, and in the future, only the true independence of the journalist ensures the survival of professional journalism as a public good. We argue that this independence, in spite of the daily pressures on journalists, could be strengthened in the digital age.

This is, first of all, because the culture and technology of the Internet is constructed as a platform of freedom that makes it difficult for governments and corporations to enforce censorship in the digital networked age. Indeed, censorship is difficult because information circulates in the global Internet networks, open to public view. When information is censored in some countries, the open, networked structure of the Internet allows distribution of information that can be accessed through multiple platforms, including in countries such as China or Iran (Castells, 2009). Second, countless citizen journalists contribute with their reports, images, information, and opinions, making it possible for the practice of journalism to broaden the scope and diversity of its sources. Third, new journalistic practices lead to a multiplicity of stories. There is no longer the possibility of imposing the official story to the exclusion of all others. Propaganda is clearly differentiated from reporting, as the multiplicity of reporting in content and platforms exposes direct ideological or political manipulation.

Furthermore, there is still a need for sense-making—for a professional processing and understanding of information. And there is still a major need for professional story telling. Thus, the practice of professional journalism can rise to a higher level of quality and autonomy. The information—almost any information—is in the open. Subjective opinions populate the blogosphere. And professional journalism may make sense of the multiple sources for the public at large. Of course, many other professionals (scientists, for example) also function as society's sense-makers. However, if the journalism profession emphasizes this function and integrates it at the core of journalism education and professional management of the news, it will provide the organizational and institutional platform to adequately perform this role.

The total amount of available information is growing so fast (Hilbert & López, 2011), and some new fields are so complex to report on, that we are moving into a period of specialization and division of labor within journalism. Giga data sets require specialist knowledge to be retrieved and interpreted. It helps if we can collaborate with specialists (programmers, hackers, designers) to harvest data from the Internet (semantic, numbers, visuals). To deal with increased competition and attract attention of audiences in an environment of information overload, effective storytelling will require special skills and special talent. If so many software programs and citizen reporters are bringing the facts, the images, and the news of the hour, then professionals should be liberated to focus on explanation, contextualization, sense-making, and, yes, reporting about what they see and hear.

While we can imagine specialization in splitting the different phases of journalism, we also see a need for increased specialization in content areas and subject matter. Reporting on issues such as nano-technology, bio-informatics, financial journalism, national security, or religion increasingly requires special training, or at least substantial knowledge of the field to be covered. And as rich as the information available through the Internet is, much is not there, and first-hand reporting remains an essential part of good journalism.

In sum, in the global network society, individual journalists are not necessarily equipped to perform each of the three key tasks of traditional journalism in unity. Some are good at gathering data, facts, or images; others are better at interpreting them, and still another kind of journalists may specialize in crafting compelling and emotional stories on the basis of facts. But as a network, we can optimize resources and generate synergy, and new creativity will emerge from our sharing.

The networked journalism of the digital age is not a threat to the independence and quality of professional journalism, but a liberation from strict corporate control. It is an opportunity for journalists to each excel in a unique way, and for society to benefit, both from an endless expansion of information, and from meaningful interpretation of this information in a world characterized by informed bewilderment.

References

American Society of Newspaper Editors. (2011). Newsroom employment up slightly, minority numbers plunge for third year. Retrieved from http://asne.org/article_view/articleid/1788/newsroom-employment-up-slightly-minority-numbers-plunge-for-third-year.aspx

American Census Bureau. (2009, September). Current population survey.

Anderson, C. (2006). The long tail: Why the future of business is selling less of more. Retrieved from http://www.wired.com/wired/archive/12.10/tail.html

Arsenault, A., & Castells, M. (2008). The structure and dynamics of global multi-media business networks. *International Journal of Communication*, *2*, 707–748.

Beckett, C., & Mansell, R. (2008). Crossing boundaries: New media and networked journalism. ICA Communication, Culture & Critique 2008. Retrieved from http://eprints.lse.ac.uk/4221

Bozokswy, P. (2008). *Digitizing the news*. Cambridge, MA: MIT Press.

Castells, M. (2009). Communication power. New York: Oxford University Press

Costeltoe, S. (2011, November 26). Q&A: BBC's UGC Hub Part 1. Retrieved from http://startcrowdsourcing.com/tag/crowdsourcing

de la Pena, Weil, P., Llobera, J., Giannopoulos, E., Pomés, A., Spanlang, B. et al. (2010). Immersive journalism: Immersive virtual reality for the first-person experience of news. Retrieved from http://s3.amazonaws.com/publicationslist.org/data/melslater/ref-204/ImmersiveJournalism_PresenceFINALforPublication.pdf

de Vries, B. (2011, November 30)NOS Net: The ultimately crowdsourcing platform. Retrieved from http://startcrowdsourcing.com/nos-net-the-ultimate-crowdsourcing-project

Dufresne, D., & Brault, P. (2011) Prison Valley. (Web documentary) in Cañon City, Colorado, U.S.

Gaza Sderot: Life in spite of everything. (2009). [Documentary film]. Available at http://gaza sderot.arte.tv

Garcia de Madariaga Miranda, J. M. (2008). El periodismo en el siglo XXI. Una profesión en crisis ante la digitalización. Mexico: Dykinson.

Gluck, M., & Roca, M. (2008). *The future of television: Advertising, technology and the pursuit of audiences.* Los Angeles: University of Southern California.

Grueskin, B., Seave, A., & Graves, L. (2011). *The story so far: What we know about the business of digital journalism.* New York: Columbia Journalism Review Books.

Henneke Hagen, H., & de Putter, J. (Eds.). (2011). *Money and speed: Inside the black box.* [Documentary film].

Highrise. (n.d.). [Documentary film]. National Film Board of Canada. Retrieved from http://highrise.nfb.ca

Hilbert, M., & López, P. (2011). The world's technological capacity to store, communicate, and compute information. *Science*, *332*(6025), 60 –65. doi:10.1126/science.1200970

Jarvis, J. (2006, July 6). Networked journalism. Retrieved from http://www.buzzmachine.com/2006/07/05/networked-journalism

Kaye, J., & Quinn, S. (2010). *Funding journalism in the digital age*. New York: Peter Lang.

Kuhn, V. (2011). Filmic texts and the fifth estate. Retrieved from http://scalar.usc.edu/anvc/kuhn/users/5

Mandel, M. (2010). Mandel on innovation and growth. Retrieved from http://innovationandgrowth.wordpress.com/2010/07/30/the-evolution-of-the-journalism-job-market

McChesney, R., & Nichols, J. (2010). *The death and life of American journalism: The media revolution that will begin the world again.* Philadelphia: Nation Books.

Mersey, R. D. (2010). *Can journalism be saved? Rediscovering America's appetite for news.* New York: Praeger.

Meyer, P. (2006). *The vanishing newspaper: Saving journalism in the information age.* Columbia, MO: University of Missouri Press.

Netherlands Media Art Institute. (2009, February 3–April 30). *NomadicMILK* exhibition by Esther Polak. Retrieved from http://www.artslant.com/ams/events/show/40822-nomadic-milk

Patterson, T., & Lehman, N. (2012). In Pew, State of the News Media (2012) and http://journalistsresource.org/reference/research/knowledge-based-reporting and http://journalistsresource.org/reference/research/nicholas-lemann-journalism-scholarship-reporting

Pew Research Center Publications. (2012). The State of the News Media 2012. Available at http://pewresearch.org/pubs/2222/news-media-network-television-cable-audioo-radio-digital-platforms-local-mobile-devices-tablets-smartphones-native-american-community-newspapers

Qiu, J. (2010). *Deconstructing Foxconn*. [Short film]. Retrieved from http://vimeo.com/17558439

Rogers, S . (2011). Facts are sacred: The power of data (Guardian shorts). Cambridge, UK: Guardian Books.

Rosling, H. (2011). Blogs about stats. Retrieved from http://blogstats.wordpress.com/tag/hans-rosling

Rossi, A. (2011). *Page one: Inside* The New York Times. [Documentary film].

Wagner, P. (2005, January 25). Prisoners of the census. Retrieved from http://www.prisonersofthecensus.org/news/2005/01/24/cadora

Wakefield, J. (2011). 3G mobile data network crowd-sourcing survey by BBC News. Retrieved from http://www.bbc.co.uk/news/business-14574816

Zuckerman, E. (2011). What if Tunisia had a revolution but nobody watched? Retrieved from http://www.ethanzuckerman.com/blog/2011/01/12/what-if-tunisia-had-a-revolution-but-nobody-watched