Online news: the changing digital mediascape

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Authors: Nisar Keshvani (nisar@keshvani.com)

&

Sharon Tickle (s.tickle@qut.edu.au)

Queensland University of Technology

Australia

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- Abstract -

Technology and its current applications have evolved at lightning pace transforming the digital media landscape. This paper examines some of the emerging technologies and speculates about the potentialities applications and digital convergence hold for online news media. It examines five specific technologies – audio and video streaming, Third Voice, multimedia digital editing software, Wireless Application Protocol with Cyberdisplay and immersive digital videography. Exciting innovations, technologies and protocols under development such as the prototypical virtual news reader, Ananova, V2ML, Bluetooth, Intelligent Equipment and Virtual Vision offer the promise of a wireless, streamlined electronic news production process.

Introduction

The current 'state of play' of news journalism and news producers' attitudes towards the Internet and its related technologies are aptly described by Mark Twain's[i] wry observation, "I'm all for progress but it's change I don't like". Indeed, major changes have been wrought in our news media by technological advances and the irony of using ink on trees to talk about those changes and expected developments is not lost on the authors.

Communications and Information Technologies (CITs) and digital media convergence developments of the past decade have transformed the newsgathering and transmission processes. Though not the focus of this paper, it is important to acknowledge the technological determinism versus social constructivism debate relevant to the developments in CITs. Technological determinists assert that technology is an independent entity and that changes in technology cause social change. Conversely, social constructivists argue that society's needs drive technology development and change. The question of whether it is technological determinism or social constructivism that is shaping the new media (digital television and Internet media applications) cannot be answered satisfactorily[ii].   What can be said is that the functionality already exists to allow new models of news production and delivery.

Today's Online News Providers: does size really matter?

The current industry trend of alliances between telecommunications companies, Internet start-ups, media organisations, and computer industry leaders could potentially cause an industry shake-up. In April 2000 America Online and Time Warner announced their merger and the acquisition of EMI, a music giant. Similarly the Seven Network confirmed its marriage to NBC Internet's arm owned by General Electric. *San Jose Mercury News'* Dan Gillmor commented on the AOL-Time Warner merger, "When the biggest online company controls the biggest traditional media company, you'd be wise to turn to other sources for reliable information".[iii]

This venture is not a first but is probably the biggest of such alliances. Prior to this move, media organisations such as America's ABC and NBC had made major investments in Internet companies and blended their offerings into specialised Web sites with the aim of floating these spin-off's on the stock market[iv]. Information providers such as CBS, Sony and News Corporation are merging resources with Internet/telecommunications companies for potential profit. In Australia, the Seven Network-NBC merger is part of a strategy to develop a content base for broadband platforms, including digital television. This move saved the Seven Network more than a $100 million in technological investments.[v]

Industry analysts and editors like Gillmor fear that such media concentration could undermine diversity and because most users still turn to a few news sources, most websites would not be able to match the power and reach of the single AOL-Time Warne.r[vi]

More recently the cost-cutting taking place in some online news entities such as Salon.com and APB News indicates that Web news has moved from the honeymoon period into one where online news media are required to self-fund their continued existence.[vii]

Certainly, small can be effective as small to medium virtual organisations are not limited by time or space on the WWW and are proving to be more resilient in times of conflict (witness fijilive's ability to continue up-to-the-minute news transmission when other broadcasters were blacked out during the recent Fijian coup[viii]).

Online news product

Just as the role of news publishers is changing, the news product - in this case online news - is changing its form too. The inverted pyramid convention of traditional news storytelling turns

the essay structure upside down requiring that "the journalist puts the conclusion in the first paragraph. A journalistic first paragraph thus contains the essence of the story".[ix] Most newspaper stories continue to follow this formula but the convention has been heavily criticised.

> The inverted pyramid style is just a formula for writing the least interesting way possible. It's a format for making the reader not want to finish the article [x].

Online news storytelling can escape the bounds of the summary lead. Minute to minute updates, layering, hyperlinks, non-linear story-telling structures, audio and video streaming and interactivity all contribute to the potential richness of the 'immersive' online environment. A recent exemplar of online reporting was *The Washington Post's* coverage of demonstrations in Washington at the time of the World Bank meetings. Twenty Post print reporters regularly sent dispatches to the online site which were organised chronologically into a piece called "Skirmishes on the Streets of Washington" with video clips, links to a map and backgrounders, meeting schedules, and protest schedules. Chair of the department of journalism at Emerson College, Boston said of the site, "It had the immediacy and freshness missing in too many authoritative, next-day newspaper accounts of countless events".[xi]

To accommodate differences in bandwidth, computing power and software applications, the most effective news sites layer the information in different formats so that consumers can move about the site accessing the information appropriate to their level of technological sophistication without losing the thread of the story.

Dedicated web site companions to print, radio and television programs extend the breadth and depth of information available to consumers. The 13-week Radio Australia series "Carving Out" benefited from a content-rich companion web site, particularly notable for its playful interactivity, innovative maps illustrating marine resources and nuclear test regions, animations and Pacific Island imagery[xii].

Integral to the story-telling capability of online news have been moving and still digital imagery. Veteran Australian Reuters photographer, Mark Baker, said it has revolutionised news photography[xiii]. Five minutes after the photo is snapped it can be on a web site. And with Wireless Application Protocol the photographer does not even need to be physically connected to an uplink. At the Sydney Olympics the major news media players will use only Canon-Kodak digital cameras to allow almost instant uploads to Web sites.

Along with still imagery, handheld digital video cameras (DVC) have liberated journalists from many time constraints. Chantal Aboucher is an ex-ABC freelance DVC-person who works solo mainly in news hot spots. She takes her camera equipment into a conflict zone in a backpack, gets her rushes and gets out. Much of her edited footage is shown on the Reuters and CNN web sites.

While many news producers have rushed to become well-known portals (a wide Web gateway to an array of online services and products), 'vortals' are fast becoming the preferred modus operandi. Vertical portals, or vortals, are online Web guides for a specific industry or subject. Vortals typically offer news, links, tools, newsletters, research, statistics and reviews, all focusing on a topic or industry. While Yahoo! is an example of a portal - wide, or horizontal, in its offerings - a vortal is deep, or vertical and more focussed. A portal even exists for vortals www.portals.net.[xiv]

Where the market is an identifiable and reachable demographic, an online community of interest supported by targeted advertising is proving to be a workable financial model. An example is the global entity tribe.com which has a growing number of city sites - see www.brisbanetribe.com - that address the infotainment wants of the 18-30 single demographic.

Certainly the explosion in infotainment and news web sites has expanded the job prospects for journalists. Capell of the *Wall Street Journal* said that this trend has had a "far-reaching ripple effect: Jobs are plentiful not only with online products but in other as well". The overall expansion in the job market for content providers has seen journalists' rates of pay rise and media organisations are finding it hard to hire enough qualified writers.[xv]

Online news consumer

When news first went online consumers had to seek out content using 'pull' technologies - clicking on links or typing URLs in their browsers. But increasingly intelligent agents are being used to customise news delivery. 'Push' technology in contrast sends information to the user. The user is given a free program to read the news and each time they are online updated information based on their personal specified preference is delivered to them. A successful pioneer of this technology is *Pointcast* which delivers real-time, personalized news, sports and financial information directly to the user.[xvi]

Even with such customisation consumers are confronted by a multitude of Web-based news media choices, from Web-cast radio to video streaming to specialty news sites. And while in Australia Interactive Digital Television's potential for multi-channelling and datacasting have suffered a serious setback from the Coalition Government's policy position which has led to underfunding of the ABC's transition to digital broadcasting, a ban on multi-channeling and the withdrawal of several major players from the datacasting trials, Interactive Digital Television elsewhere is moving ahead. The high degree of interactivity possible for infotainment, e-commerce and advertising will continue to drive ITV's expansion.

Third Voice – The electronic post-it pad

Unlike currently available Internet communication technology (email, chat, instant messaging or message boards), Third Voice[xvii] enables 'inline' discussion forums, ie. interactive web site communication. Launched in May 1999, its main attraction lies in the fact that it allows users the freedom and ability to openly express ideas at any point in a Web page. Prior to this development, web authors from across the world had the freedom to develop content, but the viewer only had two choices – to read or not to read the Web content.

Third Voice is a free browser companion service that allows users to comment via inline notes on any Web page. A user simply has to download Third Voice, a free service tool from the website. Sites with Third Voice capability carry tiny markers which indicate notes from other users. Clicking on a note allows the user to read the comment, and add personal thoughts or email them to a friend.

The consumer may also be the producer as the affordability and ease of operation of digital recorders, still cameras and DVCs emboldens non-journalists to record and transmit coverage of news events. Presently data transmission requires sending compressed sound and images over telephone lines, but in the future broadband delivery will allow much greater transmission speeds.

Four technologies that are changing the way news is produced and consumed on the Web are audio and video streaming, multimedia digital editing, Wireless Application Protocol with *Cyberdisplay*, and interactive images.

Audio & Video Streaming Technology

Audio and Video streaming capabilities are currently widely used. Audio and video formats are compressed to allow data to travel over a network using a CODEC (COder/DECoder). The information is compressed by the encoder replacing the original frames with more compact versions using mathematical algorithms. Decoders, or players, decompress and play audio and video.

This streaming technology has allowed media providers to broadcast live over the Internet. Current compression formats include Quicktime, Vivoplayer, Real, Windows Microsoft Windows Media (also known as NetShow) and MPEG, however low bandwidth limits the consumer's ability to receive data. A scalable technology will ensure an unbroken audio stream by scaling the amount of video data transmitted. The simplest technique is stream thinning, in which the server doesn't transmit every frame to the client. Encoding with a wavelet algorithm also allows the user to send less information per frame, losing image detail but preserving the frame rate.

The launch of broadband networks and optical fibre networks will soon overcome this limitation. For example, Singapore as part of its IT2000 vision has set up Singapore One, a high-speed, high-capacity broadband technology giving users access to interactive content, delivered faster and more reliably through fibre optics.[xviii]

Multimedia Digital Editing

Multimedia technologies such as AVID, Adobe Premiere and MAYA are at the forefront of the manipulation of digitised images. The software allows editors to digitally edit a video quickly and easily by quickly cutting, dragging, dropping and pasting scenes depicted in thumbnail format to produce a high quality product. There is no time consuming searching via rewind and fungus and tape degradation problems are eliminated. A major drawback is the high storage capacity necessary for digital video.

A recent example of the time and cost-saving uses of digitisation is the Singapore television series *Drive* which showed an episode involving a complex scene with an aerial shot of a car which had been digitally produced. The film-makers shot one take then enhanced the scene on computer by adding colour and a smooth pan which normally would have taken a day to shoot with a crane.[xix]

Wireless Application Protocol & CyberDisplay

Wireless Application Protocol (WAP) is the de-facto world standard for wireless information and telephony services on digital mobile phones and other wireless terminals. To date 75 per cent of the world handset manufacturers and carriers representing 100 million subscribers worldwide have committed to using WAP technology. According to the Strategis Group, by the year 2001 there will be over 530 million wireless subscribers around the world, with the number surpassing the one billion mark by 2005. Phones will have multimedia capabilities to retrieve email and 'push and pull' information from the Internet.[xx]

WAP specifications were jointly developed by global telecommunications experts to benefit the consumer. When this system is implemented globally, consumers will have fast and efficient access to information (including the WWW) via a wireless handset, enabling secure transactions through an easy to use interface.[xxi]

This will result in truly 'mobile' access to the Internet where subscribers are no longer restricted to the confines of a desk space or desktop. Sceptics may argue that current mobile phones are palm-sized and screen displays show only a few lines of text, however Kopin Corporation (Massachusetts) has developed the *CyberDisplay,* which is "smaller than a thumbnail and thinner than a grain of rice. It is billed as the world's smallest high-performance, high-resolution active matrix liquid crystal display".[xxii]

CyberDisplay promises future mobile phone users as much information as is presently available on personal computer monitors. With a lens and backlight, the *CyberDisplay* creates a virtual image equivalent to viewing a 20-inch, full-colour monitor from a distance of five feet, with equal clarity in bright light and dim. Manufactured from single-crystalline silicon, the displays have a density of 1,700 lines per inch and an operating speed of 180 Hz.

By the end of 2000 Kopin estimates that *CyberDisplay*-equipped phones will be capable of much of the same functionality as laptop computers, while requiring only a tiny fraction of the power. Users will be able to view e-mails, spreadsheets, and Web sites.

Interactive Pictures – Immersive Videography

Interactive Pictures Corporation has developed iPIX technology[xxiii] which can seamlessly merge two opposing photographs into a single 360-degree digital image. The two 180-degree

photographs of a scene or object are taken with conventional or digital cameras fitted with a fish-eye lens. Using software to combine two 180 degree photographs viewers can use the mouse to navigate within the photograph and beyond its borders, left, right, up or down. This replicates the vision one would achieve through 'panning' by using just two still digital images.

The possibilities that iPIX has in store are exciting. Journalists can re-create a press conference, crime scene or sports venue for the viewer with this simple-to-use technology. iPIX uses the example of the vision created by using two still images of Princess Diana's car crash site which was aired on CNN for a full ten minutes while anchors described the events live.

In addition to still photo applications an iPIX Movie can be taken with a digital video camera using a fish-eye lenses to capture all 360° of a scene. The final result is a streaming video in which a viewer can use the mouse to choose their own perspective. For example, BroadcastDVD will be able to place an iPIX-equipped movie camera in the middle of the action and viewers will choose which star to watch in 360°, independent of any other viewer. In addition to video, computer generated graphics can be incorporated to enhance the visual impact or to add additional information.[xxiv]

The Future of electronic newsgathering and production

Interconnectivity and system integration have been barriers to innovation in digital media. Advances in software that will enable users to move from one technology to another effortlessly will progress interoperability. Video to Multiple Mark-up Language Presentations Systems (V2ML) is being developed at Kent Ridge Digital Labs, Singapore. This technology will be able to format across all digital media from mobile phones, to palm tops to personal computers. Currently these instruments use varying mark-up languages to store the data.

With V2ML, duplication of audio, video and text data from one mark-up language to another is reduced and layout, content selection and sequencing can be personalised. V2ML technology will have the ability to automatically transform a single source of content into different mark-up language presentations in a user-defined manner. This will greatly reduce the workload for content and service providers as there is no need to create duplicate sets of content to cater for different devices of different bandwidth requirement and audio, visual/text display capabilities.[xxv]

The software intelligently selects key frame images from the digitized video and delivers the integrated video contents (consisting of audio components, video images and text) to the targeted device in a user-defined fashion. It may be possible for the providers to customize the contents to suit the needs of users with hearing/vision impairment, or in another instance, users with cellular phones may either listen to the news broadcast in audio form or read the text on the phone screen.

An example of its use for news production could be in the generation of backgrounders - those packages broadcasters use when something newsworthy happens and they want to put it in historical context quickly. After keying in a few commands, the system could automatically look through the video archives, pick up the relevant images and quickly assemble a sequence of images with an overlay of audio. This would save time presently taken looking for the images, editing them in sequence and dubbing over the sound.

Bluetooth technology[xxvi] is the next generation above infra-red remote control activation. Using Bluetooth equipment could be activated and de-activated remotely at considerable distance and is not limited to the present linear infra red positioning. The technology uses low-cost, short-range radio links between mobile PCs, mobile phones and other portable devices.

It has the potential to rapidly connect devices without the need for cabling and could possibly replace multiple cable connections with a simple link. The Bluetooth technology is fast becoming the industry standard.

The Bluetooth system currently operates on a radio frequency band of 2.4 Ghz ISM (Industrial, Scientific and Medical), which is license-free in nearly all countries. Although globally available, each country has a specified set of frequencies that can be used for transmission.

One possible use for this technology for broadcast purposes is to transmit instant photos and video clips from any location by cordlessly connecting a digital camera to a mobile phone or any wire-bound connection and sending the image instantly to a receiver anywhere in the world. Possible applications include reporting in war zones or difficult-to-reach and dangerous locations.

With Intelligent Equipment (also called Intelligent Appliances) it is possible for any piece of electronic equipment or appliance to be connected via a network to the Internet. This

capability could be used to run Intelligent Studios/web sites so that the reporter-editor-producer is able work solo in the field and run the studio remotely. [xxvii]   Joint Sponsors Cisco Systems Inc and the Info-communications Development Authority of Singapore and SingTel Aeradio have already developed Singapore's first intelligent, "Internet Home" that has continuous broad-band Internet access connecting nearly every household appliance and device in the four-room apartment. [xxviii]

In 1995, the Boeing 777 became the first jet designed entirely by virtual reality, meaning that Boeing's computer-generated simulation of the craft - and the ability of designers to "walk" through it - was so real that the company felt no need to build an actual full-scale mockup. In a departure from normal practice, the Federal Aviation Administration certified the resulting design months before the plane's first test flight. [xxix]   Similarly, journalists are no longer restricted by the available vision, if they want a jail-break for the news bulletin they can create virtual vision.

The combination of the technologies described above could revolutionise journalism practice. With iPIX, a solo operator can be on the ground with a digital camera to capture vision and audio. Using Bluetooth, they can pump the data back digitally to the studio instantly. The studio operator can then use V2ML to add relevant images.

With the edited program, the field or studio operator can work the studio equipment remotely through the Internet via a Web site and broadcast the show. The program can be streamed on the Web live, and viewers can add their comments and thoughts to the Website using Third Voice. Gone will be the days of primitive email and chat lines.

Add to this scenario the prototypical virtual news reader, Ananova[xxx], and the news future sure looks different. Ananova is a UK-developed virtual female news presenter, constituted by a sophisticated speech-recognition software, animation software and computing power that puts an expressive human face on online news. In her first month Webcasting worldwide, Ananova received 1.6 million unique visitors, ranking www.ananova.com among the most popular news sites. The hit rate may not, however, indicate consumer preference for Ananova herself as the site also contains rich news text and images and blue-haired Ananova has a jerky, monotonal, robotic quality that fails to endear.

According to the study, "Interactive News: State of the Art"[xxxi], while online newspapers currently have an edge over other online media, that gap will disappear as bandwidth increases and technologies such as real-time streaming video are perfected and widely

embraced. It goes on to suggest that for newspaper Web sites to remain competitive, they will ultimately have to assume many traits more common to TV programming then text based publishing.

This scenario assumes consumer acceptance of the supremacy of the personal computer paradigm of Internet access. This may be true in developed nations such as the US, but where mobile phones outnumber PCs the likelihood is that consumers will access news through their mobile phones or electronic digital assistants (Palm Pilot and the like), necessarily limiting the amount of data streaming possible. The most likely scenario is a dual system whereby one group of consumers accesses news via wireless hand held devices with limited functionality while the other uses a wireless or connected personal computer (laptop or desk top) with greater functionality.

In both scenarios digital news media are becoming richer, more customised and easier to access. Certainly, new communications and information technology will continue to converge with traditional media forms and the online news production process will continue to speed up and improve, but the true test will be whether the consumer is receptive to its potentialities.

Nisar Keshvani *(nisar@keshvani.com) recently completed his Master of Arts (Research), with the School of Media and Journalism, Queensland University of Technology where he tutors in online journalism. He is editor of fineArt forum (http://www.fineartforum) a pioneer online art and technology news service. Sharon Tickle (s.tickle@qut.edu.au) is an Associate Lecturer with the School of Media and Journalism, Queensland University of Technology. She specialises in Indonesian NewsMedia and the Internet, Freelance Journalism, Public Journalism and Journalism Ethics.*

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