

Use of Technology in Rural and Urban

Arkansas Online Newspapers

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ABSTRACT

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A content analysis of daily Arkansas online newspapers to determine the use of different technologies for conveying news and generating revenue on both rural and urban newspaper websites. The study measured usage of basic web technologies, interactive web technologies, and multimedia web technologies and compares the implementation of these technologies between urban online newspapers located in Metropolitan Statistical Areas and rural online newspapers not located in MSAs. The technologies measured include related links, photographs, search, video, audio, flash, graphic advertisements, text advertisements, forums, email contacts, chat rooms, instant polls, email delivery blogs, registration, subscription and non-traditional formats. The study found all Arkansas online newspapers used basic text and photographs to convey the news and graphic ads to generate revenue. The newspapers' websites had a very low implementation of interactive web technologies. No occurrences of multimedia technology were found.

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Introduction

The prevalence of online news has spread to the point that to an average Internet user the Internet now seems to be a common place to access news. Almost every newspaper, from the nationally-read metropolitan newspaper to the small-town daily newspaper, has a website of its own. Along with the increasing online news content, the number of people who read news online has also greatly increased over the past 10 years with around seventy percent of Internet users now reading news online (Lenhart, 2002). The Internet allows readers to choose their own news outlets. They can choose among a local newspaper website, a national newspaper site, or a web portal. The Internet has enabled the small-town daily newspaper to compete for readers with the nationally-read major metropolitan newspaper.

Content-wise, most local newspapers have decided to focus on what they know best— their home town. Technology-wise, the local newspaper is not a rival to the national newspaper. Even among local newspapers, there is a widening technology gap between rural online newspapers and urban online newspapers. The use of information technologies may be a way for rural newspapers to continue to make a profit as their local communities decline (Hindman, Ernest,& Richardson, 2001). Outing offered the ways and means for the survival of rural online newspapers using online technology. He suggested rural online newspapers think long-term and quit worrying about online content cannibalizing their print subscriber base. Second, he recommended online rural

newspapers become a local portal with all kinds of information about the communities they serve featuring everything from local government contact information to an online directory of services. Third, the online rural newspapers should provide local businesses the means to sell their products online via e-commerce. Fourth, online rural newspapers should build and host websites for local business. Finally, Outing (1999) recommended that online rural newspapers partner with local radio stations or television stations in offering web services.

Rogers' (2003) diffusion theory provides an insight into newspapers' adoption of technology. He divided the process of the adoption into five categories: innovators, opinion leaders, early majority, late majority, and laggards. Rogers said that once an idea had been adopted by a majority of the population the idea could be considered adopted. Newspapers' use of online technology to have an Internet presence has gone through the same adoption process. However, this study is not on the adoption process but on the status quo of technology used in online newspapers.

According to the 2005 Arkansas Press Association directory, all of Arkansas daily newspapers have established their web presence. Although all Arkansas daily newspapers have their own online version, the use of technology in online newspapers may vary greatly depending on geographic location, circulation, or ownership. Seven of Arkansas' online daily newspapers are located in an urban or suburban region, i.e., Metropolitan Statistical Area (MSA) as defined by the United States Office of Management and the Budget, while the

other 22 newspapers are located in a non-MSA, rural region. Among the seven newspapers located in a MSA, only six have a print circulation of over 20,000 subscribers, and only one has a print circulation over 50,000. The *Arkansas Democrat-Gazette* reported over 280,000 subscribers in the 2005 Arkansas Press Association Directory.

Eight Arkansas daily newspapers are owned by Wehco Media Corporation, including Little Rock's *Arkansas Democrat-Gazette*. Among those eight, five are located in a MSA. Three Arkansas daily newspapers are owned by the Stephens Newspaper Group. All of the Stephens newspapers are located in MSAs. The Paxton Media Group also owns four Arkansas newspapers, but only one of Paxton's newspapers is located in an MSA.

Another factor influencing the technology use of the Arkansas newspapers is the intense newspaper competition in Northwest Arkansas between the Wehco Media Corporation and the Stephens Newspaper Group. The Fayetteville-Springdale-Rogers MSA in Northwest Arkansas is Arkansas' fastest growing MSA and the sixth fastest growing MSA in the nation from 1990 to 2000 according to the U.S. Census Bureau. The *Arkansas Democrat-Gazette* publishes a Northwest Arkansas edition and in September 2005 purchased two local community daily newspapers in Bentonville and Fayetteville. The Stephens Newspaper Group publishes the *Springdale Daily News* in Springdale and the dominant newspaper in the adjoining Fort Smith MSA, the *Southwest Times-Record*.

The intense competition, geographic locations, circulation, and ownership differences create an interesting situation for online newspapers status in the predominantly rural state of Arkansas. This study is interested in pursuing the answers to three questions: to what degree do online daily newspapers in Arkansas serve their readers with the implementation of various technologies to deliver the news online; are rural newspapers in Arkansas falling behind the urban newspapers in Arkansas in the technologies they use to publish the news online; and in what specific areas of technology do the differences exist.

The answers to these questions will help mass media practitioners and mass media researchers alike. Arkansas newspaper editors and publishers will have a clear view of the differences between rural online daily newspapers and urban online daily newspapers. They will see the areas where technologies can be implemented to help improve their readership and profitability. Publishers will be able to develop plans for the implementation of new technology and plans for the allocation of budget and staffing resources in the area of online news. Furthermore, the study will provide additional insights to rural newspapers helping them to determine where and how to allocate scarce resources to be competitive with urban newspapers. Mass media researchers will gain additional insights into the technologies used in the online news product and use this study as a starting point for further investigation into the online news product, online news production and the online news audience. Researches will also learn more about rural online newspapers and how they use web technologies in comparison to urban online newspapers.

Literature Review

Technology Development

To analyze the development of technology, technology must be conceptually defined. The American Heritage dictionary provides a general definition of technology as the application of knowledge to practical purposes or the application of science to a commercial objective. Rogers (1996) provides a communications oriented definition defining technology as a “design for instrumental action that reduces uncertainty in the cause-effect relationships involved in achieving a desired outcome” (p. 13). According to Rogers, technology has hardware and software components. The hardware component is the physical object that embodies the tool. The software component is the information base of the tool. He noted that the words innovation and technology are often used as synonyms (Rogers, 1996).

This view of technology provides a useful framework for this study to examine newspapers’ technology use. Not only will the study examine and explore the physical object, but also the information base of newspaper technology will be explored and examined. But first and foremost, we will have a thorough review on how the technology has been applied and utilized in the various areas of journalism: journalism education, information gathering, news distribution, and online newspapers.

Technology in Journalism Education

The development of newspaper technology can be seen through the adoption of new technologies by journalism educators as they strive to reflect the

publications where their students will work when they graduate. In 1978, Texas A&M's reporting laboratories were converted by replacing manual typewriters with electric typewriters to keep up with newspapers' use of electric typewriters. At that time optical scanner recognition systems and video display terminals were just starting to appear in newsrooms across the United States (Harrison, 1978). Later, Texas A&M made the conversion from electric typewriters to writing labs equipped with Macintosh microcomputers for word processing, layout, and design. A survey of 173 journalism departments or schools on their use of computers showed that 79 schools reported using IBM clones, 68 schools used Macintoshes, 24 schools used Apple II machines, and 29 schools reported using some other type of computer (Eilers, 1989).

DeFleur and Davenport (1993) investigated the use of computer-assisted reporting techniques in the classroom based on a 1990 survey of all American colleges and universities with a journalism program. They discovered that while only 3% of schools taught a course that focused on database analysis in reporting, 21% of schools incorporated these concepts into other courses. Investigation into the use of technology in reporting continued when Davenport, Fico, and DeFleur (2002) looked at the instruction of computer-assisted reporting techniques in the classroom through a survey of college journalism programs in the United States. In this study the number of programs with classes focused on computer-assisted reporting rose to 46% while 92% of programs taught these concepts in other courses.

Technology in Information Gathering

Several researchers have conducted investigations into newspapers' use of technology in gathering information through computer-aided reporting. Garrison (1996) investigated the level of adoption of personal computer technology in news reporting and the type of hardware and software used by reporters through a national survey of daily newspapers. The study revealed that two-thirds of newspapers reported they used computers in some type of reporting with 42% using a form of a Windows operating system and 9% reporting using the Macintosh operating system. Garrison (1999) continued the examination of the use of computers in newsgathering by conducting a survey of editors at 510 daily newspapers. The survey revealed that larger newspapers used computers in newsgathering more often and larger newspapers have more individuals involved in computer-assisted reporting. Garrison (2002) also researched technology-aided information gathering by examining electronic mail as a newsgathering resource. The respondents were reporters and editors at randomly selected daily newspapers in the U.S. He found that more than 75% of respondents used electronic mail to obtain information from sources and around five percent of interviews by journalists were conducted solely over email.

Some researchers have looked into a specific region's use of computers in newspaper production. Neinbauer, Abbot, Corbin, and Neibergall (2000) surveyed Iowa daily newspapers to look at their use of computers in news/information flow management, newspaper production, and business uses. They found that most daily newspapers use computers for most parts of these

processes, but weekly newspapers did not use computers very much. Five news/information flow management technologies at the daily newspapers reached adoption levels: sending/receiving email, searching archives, monitoring news services, receiving letters to the editors, and receiving classified ads. Only two items reached the level of adoption at weekly newspapers: news/information and sending/receiving news items electronically.

Newspapers' reliance on technology to assist in the information gathering has increased throughout the years. In 1996, two-thirds of newspapers reported the use of personal computers for information gathering (Garrison, 1996). Furthermore, larger newspapers placed more resources into computer-assisted-reporting than smaller newspapers (Garrison, 1996). But, by 2002, 75% of respondents to a national newspaper survey reported they used email to obtain information from sources (Garrison, 2002). Newspaper technology adoption in information gathering was also examined on a regional level in Iowa revealing that daily newspapers use technology for sending email, receiving letters to the editors, monitoring news services and placing classified ads (Neinbauer, 2000). Besides information gathering, newspapers have also been interested in applying technology to news delivery.

Technology in News Delivery

Newspapers have always been interested in applying technology to their delivery methods even before the popularization of the Internet. In the 1980s many larger newspapers offered videotext and teletext services (Stix, 1987). Videotext services allowed subscribers to read news and information delivered

over phone lines on proprietary terminals. Apart from stories from local newspapers, videotext offered subscribers the ability to create their own stories, play games and ask questions of experts in an interactive forum. Teletext delivered information via the broadcast airwaves and a decoder that allowed viewers to read the information on their television sets. Internationally, teletext and videotext saw much greater acceptance in Europe with 20% of households in Great Britain subscribing to teletext and 12% of homes in France purchasing Minitels which were similar to videotext (Rogers, 1986). Cowles (1989) applied a media gratifications perspective to study the user perception of media in the later era of videotext and teletext use, and found that interactive media was perceived as more personal than non-interactive media.

Morris and Ogan (1996) addressed the rise of Internet, but lamented how mass communications researchers excluded research on the Internet from their studies as 123 U.S. newspapers went online in 1995. From 1995 to 1999, the American public's use of the Internet increased from 5.3% to 34.5%, but the use of newspapers, television, and magazines declined. However, the researchers concluded that no correlation existed between the two trends (Stempel, Hargrove, & Bernt, 2000).

With the development of a mass audience on the Internet and the multiplication of online newspapers, research into online newspapers developed. The following section is devoted to the review of the technology used in online newspapers from two different perspectives: readers and the newsroom. The

purpose is to offer an insight to the relationship between technology and the online newspaper.

Technology of Online Newspapers from the Readers' Perspective

One of the first studies to examine the online newspaper from the reader's perspective is Chyi and Lasora's (2000) study on the public's access, use and preferences for online newspapers in Austin, Texas. Austin is one of the four most wired regions in the United States whose residents tend to be wealthier, better-educated and younger than the rest of the U.S. population. The Chyi and Lasora (2000) study found that although 50% of respondents had access to the Internet, only 24% of them read the *Austin American Statesman* online, while 70% of them read the print edition of the *Austin American Statesman*. National newspapers' websites had a higher readership among Austin readers than the Austin newspaper's website, with almost 40% visiting the *New York Times* website and 32% visiting the *Wall Street Journal* online. Chyi and Lasora suggest that readers did not view the local and national newspaper websites as competitors, rather as complementary online resources.

Another approach to probe online newspapers' readers was to analyze how readers responded to news story presentation using different web site construction technology. Vargo's (2000) study of students from different majors at Ohio State University showed that most readers preferred the "headline-plus-deck" approach to the news stories on home pages rather than just the headline. Additionally, the researcher urged consideration of an abstract hypertext link

approach where readers could gain more information by just reading the abstracts of the different stories.

Tewksbury and Althaus (2000) compared readers' recognition and recall of different information after multi-day exposure to print and online versions of *The New York Times*. They examined the reader's impression of story importance in the presentation of news online and the reader's ability to self-select news they felt was important. They found online readers were less likely to recall having read national and political stories and more likely to remember business and other news topics because the online version presented fewer cues to news importance and readers used their own interests to determine which stories to read. Sundar (2000) continued to study reader recognition and recall by examining reader responses to online news presented with different technologies including text-only, text with pictures, text with pictures and audio, and text with pictures and video. The results showed greater recall when adding pictures to a plain text story, but recall decreased when adding audio or video to the text and pictures. The researchers offered several explanations for this phenomena including poor audio and video quality, distraction by the audio and video, or triggered behavior of passivity learned from viewing television and listening to radio.

Schierhorn (1999) analyzed whether readers prefer the portable document format of news and information to a traditional web format when accessing news. He investigated readers' preference in the two different formats' navigation, information utility, design, physical format, download time, and overall

preferences by asking users to look at three separate versions of the same online newspaper. He found that most users disliked the navigation, utility, design, and wait time of the traditional web format.

Beyers (2004) studied the issue of interactivity of online newspapers in Holland. He explored the use of discussion boards of the Dutch newspaper *De Standaard* by analyzing how many people used the discussion board and with what frequency they used them. Their analysis showed that over a period of six months from October 2003 to April 2004, 957 unique users posted on the message boards accounting for only 36 percent of the total visitors to the discussion boards' showing that many users who did not post their own original content enjoyed reading other's postings.

A significant amount of research has been conducted on the reader's perspective of online newspapers' use of technology. Readers see national, regional, and local online newspapers as complementary resources rather than competitive resources (Chyi & Lasora, 2000). In the presentation of the news, readers prefer their news in a portable document format online rather than a traditional web format (Schierhorn, 2000). When presented in a traditional web format, readers prefer a headline plus deck approach to linking to a news story rather than just a headline linking to the story (Vargos, 2000). Reader recall was greater when text news stories were presented with photographs, but recall decreased when audio and video supplements were added to the story (Sundar, 2000). Readers also enjoy discussion forums by posting messages or reading others' posted messages (Beyers, 2003). Beside the examination of the reader's

perspective of the use of technology in online newspapers, numerous studies have shown the technologies and processes that newspapers use to produce their online editions from the newsroom's perspective.

Technology of Online Newspapers from the Newsroom Perspective

Research has been conducted into the processes and technologies newspapers use to present and deliver news online and the status and responsibilities of the newspaper staff dedicated to the online edition as well as the actual process of implementing new technologies in online newspapers. Harper (1996) investigated newspaper plans to produce revenue with their websites through a survey of the 124 daily newspapers on the World Wide Web. He found that all of the publications were attempting a variety of methods to produce revenue through their online newspaper including selling advertising, charging for subscriptions, or serving as an Internet service provider, but he did not find that the newspapers were using new or additional technologies to produce more revenue. In other early online newspaper research, Martin (1998) examined the process of how a story moves from the traditional newspaper newsroom to the online newspaper. He found the online staffers rarely changed the copy in a substantive way before publishing the story online.

Singer, Tharp, and Haruta (1999) examined staffing issues of online newspapers, and investigated how the web staff compared to the print staff in salaries, benefits, experience, and job responsibilities via a survey of online and print editors. The results revealed half of the online newspapers utilized web technology and created unique content with the most common types being chat

and discussion areas. Other types of online-only content included special packages or sections and entertainment features like polls, games, or quizzes. Thirty-five percent of respondents from papers with a circulation of less than 50,000 created unique online content. As the circulation sizes increased, so did the amount of original online content. About 65% of respondents reported original content with circulation from 50,001 to 100,000. Over 70% of respondents from newspapers with circulation from 100,001 to 250,000 created original online content and over 90% of respondents from newspapers with circulations greater than 250,000 created original online content.

Boczkowski (2004) conducted ethnographic studies of online newsrooms examining ways newspapers adopt new technologies while dealing with the implications of the convergence of technological tasks and editorial tasks. He found that online newspapers look at their users' technical expertise and content desires when deciding what new technologies to incorporate into their websites. Hence, he suggested that the introduction of new technologies in online newspapers was not only a factor of the availability of the technology, but also a factor of the production processes which generate the content.

Chyi and Sylvie (2000) conducted an in-depth interview with 14 online practitioners from a geographically diverse range of newspapers to determine how they define markets for their product. They found that larger online newspapers have a greater ambition in seeking opportunities outside their local market, but most online newspapers operate within the boundaries defined by their counterpart print newspaper. All the newspapers saw their print and online

editions as complementary and published most of their print editorial content online. All of the sites sought revenue from a variety of sources including advertising, sponsorships, subscriptions, e-commerce, and Internet service provider services.

Garrison and Dupagne (2003) examined media convergence by conducting a series of in-depth interviews with the personnel of Media General's News Center in Tampa, Florida, where the operations of the *Tampa Tribune*, WFLA-TV, and Tampa Bay Online (TBO.com) all worked together under the same roof. They found that managers of all three forms of media agreed that the greatest advantage to their converged newsroom was the availability of resources. Also, the respondents agreed that their positions were more demanding because they often produced work for multiple platforms using different forms of technologies.

Besides the studies on the staffing of online newspapers and their influence on the implementations of technologies, many studies have been conducted examining the technologies implemented in online newspapers. Li (1998) conducted a study of the websites of *USA Today*, the *New York Times*, and the *Washington Post*, content analyzing their use of text, graphics, and hyperlinks. He found that three online newspapers relied heavily on text for conveyance of news and information with a rare graphic. The author predicted that as Internet connection speeds increase so would the size and amount of photographs and graphics on newspapers homepages.

Schulz (1999) researched the interactive options in online journalism by conducting a content analysis of 100 U.S. daily newspapers' websites selected through stratified random sampling. Defining interactivity as a variable of responsiveness in interpersonal and societal communications, the author measured several interactive options such as email, live chats, online polls, and online forums. Ninety-four percent of the newspapers offered email as a response mechanism, but only 8% of the newspapers afforded their readers the opportunity to chat. Twenty-four of the 100 newspapers provided an online poll or survey, while only 33 ran a discussion forum.

Peng, Tham, and Xiaoming (1999) conducted an email survey of the publishers or online editors of U.S. daily newspapers with websites in combination with a content analysis of their websites to determine trends in U.S. online newspapers across a wide area of issues. The results showed the majority of respondents started an online newspaper to generate income and promote their print product. In the area of website design technology, findings showed that national and metropolitan newspapers followed the traditional print newspaper format with the headlines, links, texts, and graphics plus directories while a majority of local daily online newspapers only provided directories online. All of the national and metropolitan newspaper sites provided searchable online classifieds, while only half of the local dailies provided the same service. Additionally metropolitan newspapers offered services such as an online archive, searchable classifieds, reader forums, reporter's email addresses, and chat facilities. Randle (1999) researched the evolution of U.S. daily newspaper URLs

in 1999 and examined newspapers branding URL practice with the newspaper's name, their locations or even some new brand name. The study found that newspapers with URLs that showed more descriptive characteristics than just the newspaper name had more technologies invested in their websites.

Dibean and Garrison (2001) studied six online newspapers in terms of technology adoption. Their study compared local, regional, and national newspapers in two time periods. Each of the newspaper's homepages and top story pages were examined for the use of different types of web technologies including forums, chat rooms, related links, video, audio, email, polls, search, and sign-up for email delivery. The researchers found that a majority of the sites contained email, forums, and links to related information, but they contained very little use of chat rooms. They also found that the regional newspapers had the most occurrences of technology application and the largest change in the number of instances of technology used from the fall of 1998 to the summer of 1999.

Besides the studies on U.S. online newspapers, researchers have also analyzed online newspapers outside of the U.S. and found similar results. Massey and Levy (1999) performed a content analysis of English-language online newspapers in Asia, measuring their interactivity. The researchers used a 5-point scale to examine interactivity use in the areas of the complexity of content choice, responsiveness to consumers, amount of consumer-created content allowed, facilitation of interpersonal communication, and use of the Internet's potential for immediacy. Overall, the researchers were disappointed with the

amount of interactivity the newspaper offered. Most of the newspapers offered a complex amount of information, but scored relatively low in other areas of the interactivity measurement.

In summary, a significant amount of research has been conducted into the technology use of online newspapers from the newsroom perspective. Several studies were conducted on the staffing of newspapers and their influence on the implementation of new technologies. Over half of online newspapers used web technology to create online content such as special news packages and entertainment features such as polls, games, or quizzes (Singer, Tharp, & Haruta, 1999). The introduction of new technology in online newspapers is not only a factor of the availability of the technology, but also a factor of the production processes which generated content (Boczkowski, 2004). Most online newspapers sought additional revenue from a variety of sources including advertising, sponsorships, subscriptions, and e-commerce (Chy & Sylvie, 2000). Online newspaper staffers found their work demanding because they produced work for multiple platforms using different forms of technology (Garrison & Dupagne, 2003).

A number of studies have also examined the technologies implemented in online newspapers. Most newspapers relied heavily on text for conveyance of news and information with an occasional photograph or graphic (Li, 1998). Providing interactivity as a form of responsiveness in interpersonal and societal communications for users was often the goal of online newspapers' implementation of new technology such as email, live chats, online polls, and

online forums (Schulz, 1999). The majority of U.S. online newspapers contained email, forums, and links to related information, but they contain very little use of chat rooms, polls, and instantaneous updates. Larger circulation newspapers implemented more technologies in their online versions than smaller circulation newspapers (Dibeau & Garrison, 2001). Just as differences in technologies implemented are exhibited between large circulation online newspapers and smaller circulation online newspapers, differences in technologies used have been shown between urban online newspapers and rural online newspapers.

Geographic or Regional Digital Divide

The examination of the use of newsroom technology and online newspapers in regional settings led to the observation of a rural-urban gap in newspapers' use of technologies. Hindman et al. (2001) found that newspapers in more urban communities were more likely to use different kinds of information technology than newspapers in rural communities. The study examined newspaper editors' adoption and use of information technologies such as using to design pages of the newspaper, use of database software programs, use of electronic news sources, use of online services, type of computer connection used, use of email, and the web presence. The study showed that the gap between rural communities with online newspapers and urban communities with online newspapers was also widening. However, the findings showed a greater increase in the implementation of new technology within the rural communities, which may result in the gap eventually narrowing. Hindman et al. (2001) observed that "newspapers in more pluralistic counties are likely to have adopted

other, more sophisticated and profitable applications of web technology by the time the less pluralistic counties finally establish a web presence” (p. 161).

Hindman (2000) also analyzed the general population’s use of information technology to determine if the “digital divide” was widening between metropolitan and non-metropolitan populations. Hindman found that place of residence was less of an indicator of use of technology than status indicators such as income, age, and education.

Several studies outside of newspaper technology have been conducted on the digital divide between rural and urban areas. Kastsinas and Moeck (2002) examined the digital divide’s effect on rural community colleges by analyzing four major reports from the National Telecommunications and Information Administration, which outlined the digital divide in rural areas with lower penetration rates of telephone usages, personal computer ownership, and Internet access. Mills and Whitacre (2003) looked at the digital divide between metropolitan and non-metropolitan areas from the aspect of the availability of home Internet connectivity. They found that education and income were two major factors to account for the metropolitan non-metropolitan digital divide.

Rainie (2004) also examined Internet usage of rural areas in the Pew Internet and the American Life Project. The project researchers categorized their respondents as rural if they resided in a non-metropolitan statistical area (MSA), as suburban if they lived in any portion of an MSA, but not in a central city, and as urban if they resided in the central city of the MSA. Their research showed that 67% of urban residents used the Internet, while 66% of suburban residents

used the Internet, and only 52% of rural residents used the Internet. Although there are fewer rural Internet users online than suburban and urban users, rural Internet users perform many similar tasks online on a daily basis such as read email or use a search engine. However, rural users are less likely than urban and suburban users to read news online. Twenty-two percent of rural users check the news online in a typical day compared to 26% of urban users and 27% of suburban users. Also, fewer rural Internet users perform transactions like banking or online purchases than their urban and suburban counterparts.

Finally, a study in the Pew Internet and the American Life Project examined Internet use by region in the U.S. and specifically looked at Internet use in the South which includes the states of Arkansas as well as Alabama, Kentucky, Louisiana, Mississippi, Tennessee, and West Virginia (Spooner & Rainie, 2004). The South compared favorably to the rest of the nation on the use of the Internet for most tasks, but for checking their news online, users in the South had the highest proportion in the country with 63%. In comparison, Internet users in the Pacific Northwest had the smallest percentage of users (i.e. 53%) to check news online on a daily basis. Online news users' proportion in other regions fell between 63% and 53%: 58% in New England, 61% in Mid-Atlantic, 5% in Southeast, 62% in the National Capital region, 53% in the Upper Midwest, 60% in the Lower Midwest, 51% in the Mountain region, 54% in California, and 58% in the Industrial Midwest.

In summary, it seems reasonable to note that newspapers in urban communities were more likely to use more information technologies than

newspapers in rural communities. Urban newspapers were more likely to have an online version than rural newspapers (Hindman et al. 2002). But, an online newspaper reader's use of technology is often more of an indication of income, age and education rather than their place of residence (Hindman, 2000). More urban residents use the Internet than rural residents, and more urban residents check their news online than rural residents (Rainie, 2004).

Research Questions

Dibean and Garrison (2001) addressed newspaper technologies on a national scale by looking at national, regional and local newspapers. The researchers suggested that technology over the Internet could be an equalizer for smaller newspapers. Located in the South of the U.S., Arkansas with a population of 2,673,400 and 29 online daily newspapers is an ideal setting to examine online newspaper technology use. Arkansas has variety of regional and local newspapers which would allow for the comparison between larger circulation regional newspapers and smaller circulation local newspapers. Therefore, the following research question is posed.

R.Q. 1: To what degree do Arkansas online newspapers use technology to present news on their websites?

Schultz (1999) examined interactive options in online newspapers and found generally few options. An analysis of the interactive options presented by Arkansas online newspapers would provide new information on the trend in interactivity and would allow for a comparison between findings of the aggregate in the United States and that in Arkansas. Therefore a second question is asked.

R.Q. 2: To what degree do Arkansas online newspapers use interactive technology on their websites?

Hindman et al. (2001) found that the gap between urban and rural newspaper technologies was widening in 2001, but overall trend lines showed that the gap would eventually decrease because the rate of increase of the use of technologies at rural online newspapers was greater than the rate of increase in the use of technologies at urban online newspapers. Furthermore, they suggested online information technologies may be a way for rural newspapers to continue profitable operations among declining community resources. This study will explore the gap between rural and urban online newspapers in Arkansas.

R.Q.3: To what degree do metropolitan Arkansas online newspapers and non-metropolitan Arkansas online newspapers differ in the use of technology to present news on their websites?

The Pew Internet and the American Life Project (2002) presented a picture of how a rural resident's use of the Internet and online news is less than that of urban/suburban residents. This study will be a continuing effort in examining the digital technology divide between rural and urban areas. But the approach it takes is unique because it was targeted at a predominantly rural state and attempted to investigate the differences in the technologies provided to rural residents and urban/suburban residents in Arkansas by Arkansas' online newspapers.

Methodology

To answer these research questions, a quantitative study of Arkansas online newspapers was conducted using content analysis of the home page and top story page to measure the type of technologies and the extent of the technologies used on Arkansas websites.

After consulting the Arkansas Press Association Directory for 2005, a census sample was used for this study, i.e., all 29 Arkansas online daily newspapers will be analyzed because the population base of Arkansas online newspapers is not large enough to allow for random sampling. Daily newspapers are defined by the Arkansas Press Association as publishing editions at least five days a week.

A list was created inclusive of each newspaper's name, website address, circulation, location, and ownership (see Appendix B). The online newspapers were cross-referenced with the United States Census Bureau Metropolitan Statistical Areas (MSA) for Arkansas. They were marked if they were located in an MSA, and the MSA within which they were located was also identified. There are eight MSAs which are located either partially or completely in Arkansas. The MSAs are Fayetteville-Rogers-Springdale, Fort Smith, Hot Springs, Jonesboro, Little Rock-North Little Rock, Memphis, Pine Bluff, and Texarkana-Texarkana. Appendix A lists the MSAs with the counties they encompass, their population and the number of newspapers in each MSA.

A coding technique by Dibeau and Garrison (2001) was followed. Coders analyzed the home page and the top news story page of the site. The home

page is the initial page of the newspaper's web site. The top story page is the story link that is given the most prominence on the home page through position, size of type, or use of art.

The operational definition of the technology, specified by Dibeau and Garrison (2001) was featured in forums, chat rooms, related information links, video, audio, flash, e-mail, instantaneous polls, search, graphic ads, and sign-up for email delivery. Schultz (1999) measured interactive options such as email, live chats, online polls, and online forums in his content analysis of newspaper websites. The coders also coded the number of photographs and graphic ads on each of the pages which were used by Li (1998). Coders also made note of the availability of a portable document format or some other non-traditional online format of the newspaper, the presence of a blog and whether a reader is required to register or subscribe to the website.

The following are the operational definitions of the items coded.

- A forum is an online community where users can read and post information about common topics. A user interacts with a forum by submitting forms on a web page. Forums are also known as discussion boards or interactive message boards (Jansen, 2002).
- An email contact is found with the presence of email addresses on a page for the reporter or a clickable link which allows the user to send an email through an email client or through a web form (Webopedia, <http://www.webopedia.com>, n.d.).

- A chat room is a variation on a forum that allows for live synchronous discussion about a specific topic. The messages normally appear on a part of the web page next to the user's nickname or handle (Jansen, 2002).
- An instant poll asks the user a question and allows the user to choose from a number of answers and submit a form. Data from the responses to the question is displayed on the screen. All users who visit the website are allowed to answer the poll question (NCPD Polling Review Board, n.d.).
- Related links can be found on a web page as a link to other information or stories that is similar or related to the subject of that web page. A link is a URL embedded in the document so that if you click on the highlighted text another web page will be retrieved. (Baker, 2004).
- Search is a utility that retrieves information on a search term that the user queries from a form interface. The search utility can search the website a user is browsing or the World Wide Web (Jansen, 2002).
- Links to video on a web page or video embedded on a web page allow the user to view a stream of images on the website through technologies such as Quicktime, Macromedia Flash video, Windows Media, or Real Media (<http://www.pcwebopedia.com>, n.d.).
- Audio on a web page or a link to audio is present when the user can hear music, interviews, or other items streaming to his or her web page (Jansen, 2002).

- Email delivery allows the user to subscribe to an automatic mailing list where the user will enter his or her email address and sign-up to have news stories emailed to him or her on a regular basis (<http://www.pcwebopedia.com>, n.d.).
- Flash is a vector graphic animation technology that is platform independent. Flash can be found on a website that presents users with moving and interactive graphics (Jansen, 2002).
- Photographs or photo illustrations are images of people, places or events that are editorial in nature and not an advertisement.
- Graphic Ads are computer generated images that advertisers pay to place on the web page. Graphic ads may appear in the jpeg, gif or flash format (Jansen, 2002).
- Text Ads are text links that advertisers pay to place on the web page usually denoted by the terms ads or advertisements (<http://www.pcwebopedia.com>, n.d.).
- A non-traditional web format of the newspaper allows the user to browse an electronic replica of the print newspaper through a web browser. Non-traditional web formats often use portable document format technology to display the print version of the newspaper (Schierhorn, 1999).
- On a blog, the author posts a chronological electronic journal of his or her thoughts pertaining to a specific topic. Blogs allow users to post comments about the author's posts (Jansen, 2002).

- Registration is required on a website when a user must submit a username and password to gain access to the site's interior pages. To create the username and password the user must enter demographic data.
- Subscription is required on a website when a user must pay for when they register to access the site.

R.Q. 1: To what degree do Arkansas online newspapers use technology to present news on their websites?

To answer R.Q. 1, related information links, video, audio, flash, photographs, graphic ads, text ads, search, email delivery, blogs, and non-traditional formats were coded. Related links were coded as ratio level data, i.e. how many links were made available on the home page and top story page that were related to the topic of the page. Video, audio, flash, photographs, stories on home page, graphic ads, and text ads were all coded as ratio level data. Blogs were coded as nominal level data, i.e., the coder noted whether a blog was made available on the home page. Search, email delivery, registration, subscription and non-traditional formats to deliver the paper were all coded as nominal level data.

R.Q. 2: To what degree do Arkansas online newspapers use interactive technology on their websites?

To answer R.Q. 2, forums, email contacts, chat rooms, and instant polls were coded. Forums were coded as ratio level data, i.e., how many forums were available on the home page or top story page or as a link from the home page or

the top story page. Email contacts, chat rooms, and instant polls were all coded as ratio level data.

R.Q.3: To what degree do metropolitan Arkansas online newspapers and non-metropolitan Arkansas online newspapers differ in the use of technology to present news on their websites?

To answer R.Q. 3, related information links, video, audio, flash, photographs, stories on home page, graphic ads, text ads, search, email delivery, non-traditional formats, blogs, forums, email contacts, chat rooms, instant polls, and geographic location in an MSA were coded. Related links were coded as ratio level data, i.e., how many links were made available on the home page and top story page that are related to the topic of the page. Video, audio, flash, photographs, graphic ads, text ads, forums, email contacts, chat rooms, and instant polls were all coded as ratio level data. Search was coded as nominal level data, i.e., the coder noted whether search was made available on the home page. Blogs, email delivery, registration, subscription and non-traditional formats to deliver the paper were all coded as nominal level data. Geographic location in an MSA was coded as nominal level data, i.e. whether the newspaper was located in an MSA or not.

Two senior Mass Communications majors at Ouachita Baptist University were selected as coders. Both students were currently taking a mass communications website design course. These students have a stronger aptitude toward recognizing the different web technologies because of their participation in this course. The coders attended a training session to review their

knowledge of the technologies employed by online newspapers' websites and learn the proper way to code the sample websites. Then the coders participated in a test coding of sample online newspapers from the state of Missouri.

After the coder training is complete, several sample websites Texas were coded to test the coding process. As suggested by Weare and Ling (2000), all coders accessed the website from computers with the same operating system and monitor resolution and with the same web browser to ensure a consistent point of view for the website. As the coders coded each site they filled out a coding sheet entering the requested data. The data from the coding sheet was entered into a Microsoft Excel spreadsheet which then was exported into SPSS for statistical analysis. On the sample websites the coders achieved an intercoder reliability of 0.924 when determined using Holsti's R. Since a sufficient level of intercoder reliability was reached, the coders coded the Arkansas sample. The sites were coded on Thursday, November 18, 2005. After all the Arkansas online newspapers in the sample were coded and entered in the database, the analysis process began.

For R.Q.1, the total number of instances of related information links, video, audio, flash, photographs, graphic ads, and text ads per newspaper were entered for each newspaper. Then the median, mode and mean were used to determine how all 29 Arkansas online newspapers utilized the above online technology. The presence of search, email delivery, blogs, registration, online subscriptions and non-traditional formats were analyzed using frequency to estimate how all 29 Arkansas online newspapers utilized the above online technology.

For R.Q. 2, the total number of instances of forums, email contacts, chat rooms, and instant polls per newspaper were entered. Then the mean, median and mode were used to determine the status quo of 29 online Arkansas newspapers using online interactive technology. The presence of forums, email contacts, chat and instant polls was also analyzed using frequency to estimate how all 29 Arkansas online newspapers utilized the above online technology.

For R.Q. 3, comparison of means, media and mode were made for related information links, video, audio, flash, photographs, graphic ads, text ads, forums, email contacts, chat rooms and instant polls for newspapers located in a MSA and newspapers not located in a MSA. Cross-tabulations of frequency were used for search, email delivery, blogs, registration, online subscription and non-traditional formats for newspapers located in an MSA and newspapers not located in a MSA.

Results

R.Q. 1: To what degree do Arkansas online newspapers use technology to present news on their websites?

In the area of story presentation technology, Arkansas newspaper websites made an average of two related information links per page. Photographs were used on almost every site with an average of 2 photos (see Table 1). Among the 29 websites, 25 of them or 80% utilized search technology (see Table 2).

In the area of multimedia technology, no audio or video was found on the home page or top story page of any of the newspapers. Arkansas newspaper websites had almost no Flash usage (see Table 1).

In the area of delivery technology eight or 28% used email delivery of information and six or 21% used non-traditional formats of delivery. Only one newspaper website (3%) used blogging technology (see Table 2).

With regards to revenue production technology, Arkansas newspaper websites used many more graphic ads than text ads: an average of 11 graphic ads and only 1 text ads (see Table 1). For the access to the websites, one required registration and six required subscription for access (see Table 2).

Arkansas newspaper websites used very basic technology such as related information links, photographs and search tools. However, the multimedia technologies such as audio, video and flash were not employed at all. Only 3% of the websites used blogging technology indicating the very low use of the popular interactive technology among Arkansas newspapers. Looking at the technologies that directly generate revenue, the sites relied more on graphic ads than text ads and graphic ads averaged 11 per site which is a large number of ads for the two pages. In regards to the newspaper site access, three percent of the sites require registration, but 28% require subscription.

Table 1

Web technologies used per newspaper

	μ	M_d	M_o
Related Links	2	0	0
Photographs	2	2	1
Video	0	0	0
Audio	0	0	0
Flash	0	0	0
Graphic Ads	11	10	10
Text Ads	1	0	0

Table 2

Newspapers that used each type of technology (n=29)

	%	n
Search	86%	25
Blogs	3%	1
Email Delivery	28%	8
Non-traditional format	21%	6
Registration Required	3%	1
Subscription Required	21%	6

R.Q. 2: To what degree do Arkansas online newspapers use interactive technology on their websites?

Arkansas online newspapers on average rarely used any forums, chat and instant polls on their website. In regards to the use of email contacts, Arkansas newspapers provided an average of one email contact per website (see Table 3).

Table 3

Number of interactive web technologies used per newspaper

	μ	M_d	M_o
Forums	0	0	0
Email contacts	1	1	2
Chat	0	0	0
Instant polls	0	0	0

R.Q. 3: To what degree do metropolitan Arkansas online newspapers and non-metropolitan Arkansas online newspapers differ in the use of technology to present news on their websites?

In the area of story presentation technology, metropolitan Arkansas newspapers made an average of three related information links per page, but non-metropolitan Arkansas newspapers made an average of one related link per page. Photographs were used more often by non-metropolitan newspapers with

an average of two photographs for non-metropolitan newspapers and an average of two photographs for metropolitan newspapers (see Table 4). Search was used nearly equally between non-metropolitan newspapers and metropolitan newspapers with 83% of metropolitan newspapers implementing search and 85% of non-metropolitan newspapers offering search (see Table 5).

In regards to multimedia technology, no Arkansas newspapers used audio or video on their website. Both metropolitan newspapers and non-metropolitan newspapers had no Flash on their websites (see Table 4).

In the area of interactive technology, a slightly higher occurrence of instant polls was found in non-metropolitan newspaper websites than metropolitan newspaper websites: one instant poll in non-metropolitan and zero in metropolitan newspaper website. Both non-metropolitan and metropolitan newspapers had an average of zero forums and zero chat rooms. Email contacts were slightly higher at metropolitan newspapers than non-metropolitan newspapers with a mean of two email contacts per newspapers located in a MSA and a mean of one email contact per newspaper located in a non-MSA (see Table 4).

In the area of delivery technology, email delivery was used much more by metropolitan newspapers than non-metropolitan newspapers: 46% for metropolitan newspapers and 12% for non-metropolitan newspapers. Blogs were only used by one metropolitan newspaper and non-metropolitan newspapers used none. A non-traditional web format of the paper was offered more often by

non-metropolitan newspapers than metropolitan newspapers with 24% for non-metropolitan newspapers and 17% for metropolitan newspapers (see Table 5).

With regards to direct revenue producing technology, more graphic ads were used by metropolitan newspapers with a mean of 14 graphic ads in metropolitan newspapers and a mean of nine graphic ads for non-metropolitan newspapers. Text ads were used more often in non-metropolitan newspapers than metropolitan newspapers with an average of one text ad per non-metropolitan paper and zero text ads per metropolitan paper (see Table 4). Likewise, registration was only used by one metropolitan newspaper and no non-metropolitan newspapers. A subscription was required by 25% of metropolitan newspapers and 18% of non-metropolitan newspapers (see Table 5).

Metropolitan or urban online newspapers used more basic web technologies on their websites than non-metropolitan or rural newspaper websites. Urban newspapers featured more related links on their sites, more uses of flash animation technology, and more email contacts than rural newspapers. More urban newspapers offered email delivery and required their readers to register or subscribe than rural newspapers. One urban newspaper featured a blog on its website, but no rural newspapers used blogging technology on their websites.

Although urban online newspapers exceeded rural newspapers in most areas of web technology, rural newspapers did offer more instances of specific news presentation and interactive technologies. Rural newspapers offered more photographs per website than urban newspapers and more text ads per website

than urban newspapers. Rural newspapers were almost equal to urban newspapers in their offerings of interactive technology with more instances of instant polls. More rural newspapers provided a non-traditional web format of the newspaper than urban newspapers.

Table 4

*Number of web technologies per newspaper on coded pages**MSA vs. Non-MSA*

	MSA			Non-MSA		
	μ	M_d	M_o	μ	M_d	M_o
Related links	2	0	0	1	0	0
Photographs	2	2	1	2	2	0
Video	0	0	0	0	0	0
Audio	0	0	0	0	0	0
Flash	0	0	0	0	0	0
Forums	0	0	0	0	0	0
Email contacts	2	2	2	1	1	0
Instant polls	0	0	0	1	0	0
Chat rooms	0	0	0	0	0	0
Graphic ads	14	11	6	9	9	10
Text ads	0	0	0	1	0	0

Table 5

Percentage of newspapers using specific technologies

MSA (n=12) vs. Non-MSA (n=17)

	MSA		Non-MSA	
	%	n	%	n
Blogs	8%	1	0%	0
Search	83%	10	85%	15
Non-traditional format	17%	2	24%	4
Email Delivery	50%	6	12%	2
Registration required	8%	1	0%	0
Subscription required	25%	3	18%	3

The assumption made before the data collection on the Arkansas newspaper websites is that the newspaper websites utilized a lot of technology tools to present news to users. However, it turned out the technology tools were not fully utilized in the Arkansas newspaper cyberspace. Therefore a post-hoc exploration was launched to see what technologies are made available on the Arkansas newspaper websites. To convert the ratio level data into the nominal level data, a nominal level scale was created for each ratio variable. The nominal level variable was marked as “yes” if the corresponding ratio variable data was greater than zero.

When examining the technology made available over all Arkansas newspaper websites, the post-hoc analysis revealed an interesting use of technology among Arkansas newspapers. For story related technology, 34% of Arkansas newspapers offered related links but 93% of Arkansas online newspapers offered photographs on their website. Search was available on 86% of Arkansas newspaper websites. In the area of multimedia technology, no Arkansas online newspapers offered audio or video and only 10% of newspapers had flash on their website. In the area of interactive technology, 17% of Arkansas newspapers provided forums on their website. Chat rooms were offered by seven percent of newspapers and instant polls were made available on 38% of newspapers. Email contacts were made available on 76% of Arkansas online newspapers. Regarding delivery technology, email delivery was found on 28% of newspaper websites and a non-traditional web format of the newspaper was found on 21% of the newspaper websites. Blogs were only available on three percent of newspaper websites. In the area of revenue producing technology, all Arkansas newspapers served graphic ads, but only 17% of newspapers offered text ads. Only 3% of the newspapers required registration to view the interior pages and 21% of online newspapers required a subscription (see Table 6).

When comparing the technologies used in newspapers located in MSAs to newspapers not located in MSAs the post-hoc analysis reveals interesting differences between urban and non-urban online newspapers. In the area of story technology, five metropolitan online newspapers offered related links representing 42% of all metropolitan newspapers while five non-metropolitan

newspapers offered related links representing 29% of non-metropolitan newspapers. Photographs were found on 92% of metropolitan newspapers and 94% of non-metropolitan newspapers. Search was found on 83% of metropolitan newspaper websites and on 52% of non-metropolitan newspaper websites (see Table 6).

Regarding multimedia technology, Flash was presented by 17% of metropolitan newspaper websites and 6% of non-metropolitan newspaper websites, but no Arkansas newspaper website contained audio or video (see Table 6).

In the area of interactive web technology, forums were found on one metropolitan newspaper website representing eight percent of non-metropolitan newspapers and on four non-metropolitan newspapers representing 24% of non-metropolitan newspapers. Eighty-three percent of metropolitan newspapers were found with email contacts and 71% of non-metropolitan newspapers were found with email contacts. Chat rooms were present in zero metropolitan newspapers and two (12%) non-metropolitan newspapers. Twenty-five percent of metropolitan newspapers had instant polls and 41% of non-metropolitan newspapers had instant polls (see Table 6).

In the area of delivery technologies, email delivery was available on half of the metropolitan online newspapers and 12% of non-metropolitan newspapers. Only one (8%) metropolitan newspaper had a blog and no non-metropolitan newspapers had a blog. A non-traditional web format was offered by 17% of

metropolitan newspapers and by 24% of non-metropolitan newspapers (see Table 6).

Regarding technology which directly produces revenue, graphic ads were present on all 12 metropolitan newspapers websites and all 17 non-metropolitan websites. Text ads were used by one (8%) metropolitan newspaper and four (24%) non-metropolitan newspapers. Registration was required by one (8%) metropolitan newspaper and no (0%) non-metropolitan newspapers required registration. A quarter of metropolitan newspapers required a subscription to view interior pages and 18% of non-metropolitan newspapers required a subscription (see Table 6).

More non-metropolitan newspapers offered photographs, text ads, forums, chat rooms, instant polls, and non-traditional formats than metropolitan newspapers. More metropolitan newspapers offered related links, Flash, email contacts, search, email delivery, blogs, registration, and subscriptions. All metropolitan and non-metropolitan newspapers offered graphic ads and no metropolitan or non-metropolitan newspaper offered audio or video.

Table 6:

Web Technologies Used by Arkansas Online Newspapers

	Total (n=29)		MSA (n=12)		Non-MSA (n=17)	
	Number	Percent	Number	Percent	Number	Percent
Related links	10	34%	5	42%	5	29%
Photographs	27	93%	11	92%	16	94%
Search	25	86%	10	83%	15	52%
Video	0	0%	0	0%	0	0%
Audio	0	0%	0	0%	0	0%
Flash	3	10%	2	17%	1	6%
Forums	5	17%	1	8%	4	24%
Email contacts	22	76%	10	83%	12	71%
Chat rooms	2	7%	0	0%	2	12%
Instant polls	11	38%	4	25%	7	41%
Blogs	1	3%	1	8%	0	0%
Email Delivery	8	28%	6	50%	2	12%
Non-traditional format	6	21%	2	17%	4	24%
Graphic ads	29	100%	12	100%	17	100%
Text ads	5	17%	1	8%	4	24%
Registration required	1	3%	1	8%	0	0%
Subscription required	6	21%	3	25%	3	18%

Discussion and Conclusion

Comparison between Arkansas newspapers websites and other newspapers websites

Comparing this study to other studies on online newspapers reveals there are more differences than similarities between Arkansas online newspapers and online newspapers across the U.S.

Arkansas online newspapers had similar levels of interactive technologies (forums, chat rooms, email contacts, and search) as a cross-section of local, regional, and national online newspapers studied by Dibeau and Garrison (2001). But Dibeau and Garrison found much use of audio and video on their websites while Arkansas online newspaper websites had no use of audio or video. These differences may be attributed to the fact that this study is a census of all newspapers in one region but Dibeau and Garrison (2001) examined “elite” newspapers selected for their journalistic reputation.

This Arkansas online newspaper study concurred with Li’s (1998) findings on the *New York Times*, *USA Today*, and the *Washington Post* in that textual information is the dominant newspaper content on the World Wide Web, but the number of interactive options offered by Arkansas newspapers falls behind the level of interactive technologies found in national newspaper websites (Peng, et al., 1999; Schulz, 1999). Schulz’s (1999) study of U.S. newspapers and Peng, et al.’s (1999) study both concluded that one-third of U.S. newspapers offer forums, an interactive web technology, but only 17% of Arkansas newspapers in this study offered forums.

The differences between Arkansas online newspapers and newspaper websites across the U.S. may be attributed to the dominance of the Arkansas newspaper market by newspaper chains with the Wehco Corporation owning over 25% of the daily newspapers in Arkansas. Newspaper chains usually implement the same web technology solutions for all the newspaper websites in their chain. Once a technology is implemented in the same manner in all of the newspapers in their chain, newspaper chains believed that they have achieved efficiency and they no longer have the motivation to innovate new technologies at each individual newspaper, which explains why in general Arkansas newspaper websites lag behind other local, regional, or national newspaper websites in terms of technology employment.

On the other hand, differences in the implementation of technology may also be attributed to the rural nature of the state of Arkansas, which has the overall smaller size of newspapers than average daily newspaper in the United States. Arkansas daily newspapers had an average circulation of 20,904 in 2004 but the average circulation of daily newspapers across the United States was 37,684 in 2000 according the *Editor and Publisher Yearbook*. Smaller newspapers have fewer resources to invest in new technologies and fewer staff to devote to new innovations.

Urban Arkansas newspaper websites and the Arkansas Democrat-Gazette

Urban Arkansas newspapers focused on revenue generation in their implementation of web technologies. Urban newspapers averaged 14 graphic ads per newspaper. This level of online ads on just two pages illustrates an

effort put into the marketing and advertising endeavor. With an average of seven ads per page the reader may be overwhelmed with advertisements and every single ad may be lost in the confusion created by the presentations of all seven ads at the same time. Reducing the number of ads to three or four strategically placed ads per page may increase the advertisers' return on their advertising dollar and allow the newspaper to increase their online advertising rates by decreasing their advertising inventory.

In other revenue generating technology, three urban newspapers required subscriptions and one urban newspaper, Conway's *Log-Cabin Democrat*, required registration. The overall concept supporting subscriptions for an online newspaper is to protect the print circulation from eroding by allowing readers getting their news online. However, requiring a subscription for an online newspaper may greatly reduce online readership, the number of ads placed on the website, and eventually the online advertising revenue. Requiring registration is a better strategy to build online revenue than requiring subscriptions. Through registration, a newspaper can allow their advertisers to target readers in a specific demographic group with their ads and charge a much higher ads rate for the targeting. For example, if a Lexus automobile dealership wants to advertise to females between the ages of 35-50, then the newspaper through the registration and log-in information can ensure that the Lexus dealership ads are only seen by females age 35-50.

Urban Arkansas newspapers did a good job of using different delivery technologies to place the news into the hands of their readers. Half of the urban

newspapers used email delivery to push the news to the readers. Pushing the news to readers can be a very effective delivery technique that allows the newspaper a chance to push ads with the news to readers' email inbox. When combined with registration, email news accompanied with advertising can be an ideal way to target specific demographic groups, just like web page advertising.

A good example of Arkansas urban newspapers' overall use of web technology is the *Arkansas Democrat-Gazette*. With a circulation seven times larger than the next largest newspaper in Arkansas, the *Democrat-Gazette* should be a leader in implementing technologies on its website. Unfortunately, its implementation of web technologies was just average in comparison to other Arkansas newspapers. The *Democrat-Gazette* utilized 10 different types of technology on their website while all Arkansas online newspapers on average only employed eight technologies on their website; however the *Democrat-Gazette* only offered a total of 26 instances of technology on its website while the mean for Arkansas newspaper websites was 27 instances of technology.

The competition and growth in Northwest Arkansas does not seem to have an effect of the number of web technologies implemented on online newspaper websites in the Northwest Arkansas MSA. The Stephens Media Group's *Morning News* implemented nine different kinds of technology where the *Arkansas Democrat Gazette* implemented ten different kinds of technology. The *Arkansas Democrat-Gazette* does not have a Northwest Arkansas edition of their website as they do a Northwest Arkansas edition of their print product. The *Northwest Arkansas Times*, which was purchased in September 2005 by Wehco,

the owners of the *Democrat-Gazette*, only utilized seven different types of web technologies, but they were the only Arkansas online newspaper to implement blogging technology on their website. It will be interesting to see if Wehco redesigns the *Northwest Arkansas Times* website and implements technologies on their other Wehco newspaper websites such as subscription and a non-traditional format and to see if any of the Wehco newspaper websites adopt the blogging technology used on the *Northwest Arkansas Times* website.

Rural Arkansas Newspaper Websites

Many smaller rural online newspapers used similar web technologies because they used the same software and web site hosting service to publish their online newspapers. A number of rural newspapers used TownNews service to publish news online, and the service (<http://www.townnews.com>) builds in interactive options like forums, instant polls, and search into their basic page template, which explains why this study found Arkansas rural newspaper websites had a greater use of interactive technologies. Although it is efficient for small rural newspapers to rely on templates to deliver news, the disadvantage is that it creates a similar look and feel for many of the smaller newspapers. One coder noted that many of the smaller newspapers had the exact same template making it difficult to tell the newspapers apart.

Unfortunately, many local newspaper websites in Arkansas seem to be created solely to prevent a competitor from creating a web-only information portal in their market and are missing out on many brand and revenue building opportunities that web technology presented. One of the areas of growth in local

newspaper technology has been the implementation of interactive technology to support user-created content where the reader can post their opinions to a forum or create their own blog or photo gallery on the newspaper website. These technologies have been very popular in the areas of entertainment, sports, and recreation oriented websites, which provide additional opportunities for revenue growth for highly targeted advertising and sponsorships.

Arkansas Newspaper Websites

Arkansas daily newspapers have a diverse set of geographic, circulation, and ownership circumstances which may affect web technology implementation on their websites. Through the use of basic web technologies, the online editions of the Arkansas newspapers accomplished the same goal as their print counterparts: inform the public and try to make a profit.

To inform the public, all Arkansas online newspapers relied on text stories to convey the news on their websites, and 93% of them used photographs to visually communicate the news. Urban newspapers provided more news stories on their websites than rural newspapers. Most Arkansas newspapers provided their readers a search utility to navigate their websites. To produce revenue, all of the Arkansas online newspapers ran graphic ads on their website and 21% of them required a subscription to read the news stories on their website. But Urban newspapers served more graphic ads than rural newspapers.

In the area of engaging their readers through interactivity, Arkansas online newspapers had a very low level of implementation of interactive web technologies. While 76% of Arkansas newspaper websites offered email

contacts, only 38% offered instant polls, 17% provided forums, and 7% provided chat rooms. Rural newspapers provided more instances of chat rooms, forums, and instant polls than urban newspapers because of their reliance on a generic web hosting service. Interactive web technologies require additional supervision of chat rooms and forums by newspaper employees and an investment in purchasing the technologies to place them on the website. Newspaper editors and publishers are leery of investing in technologies where they do not see a return on their investment. Unfortunately, Arkansas newspapers are missing many of the benefits of interactive web technology. By allowing feedback from the reader, interactive newspaper technology takes advantage of the Internet's ability to create a more personal medium. Interactive web technologies enable users to contribute to the online newspaper's content through chats, forums, and polls and earn revenue through sponsorship opportunities. Email contacts help reporters and editors stay in contact with their readers and potential sources.

All of Arkansas online newspapers failed to utilize multimedia elements to enhance news stories ability to tell a story via audio, video, or flash. To implement multimedia on a newspaper website requires the investment in staffers with a different set of skills from the normal newspaper editorial employee and an investment in equipment which will be used solely on their website. Unless the publishers and editors can see a direct financial or tangible benefit to the newspaper, newspapers will normally not invest in multimedia technology for their website. However, the benefits of employing multimedia are countless. Unfortunately, Arkansas newspapers are missing many of the benefits

of multimedia technology. The presence of multimedia on a newspaper website engages readers more than the print product can offer and it may enhance the newspaper brand in the community. The lack of multimedia use on Arkansas newspaper websites also illustrates the fact that Arkansas newspapers haven't established any partnerships with local radio and television stations who could easily contribute audio or video to the website. Multimedia stories also present opportunities for new forms of targeted audio and video advertisements that the user must hear or view first before they are provided the multimedia news presentation.

It seems that the Arkansas daily newspaper websites did little to go beyond their print counterparts by providing text news stories and photographs, listing contact information for readers to provide feedback, and employing search utilities for readers' in-depth navigation. Many Arkansas online newspapers fell short of personally engaging and informing their readers with interactive and multimedia web technologies, which actually are the most important and unique characteristics of the Internet. Arkansas daily newspapers have a long way to go to fully realize and implement the unique technologies of the Internet.

Limitations and Suggestions

This study, like any other studies, has its own limitations. First, this study is only a study of Arkansas online newspapers and the results cannot be generalized to newspaper websites outside the state of Arkansas, not even to its neighbor states because this study conducted a census of Arkansas newspaper technology. Second, this study only gives us a snapshot of the technologies used

on Arkansas newspaper websites on the date the content analysis was conducted. It is not a longitudinal study which would allow for tracking the changing technologies over a period of time. Third, this study does not take factors into account besides geographic location. It did not examine how personnel staffing, newspaper funding, or newspaper circulation would make an impact on the number of web technologies used. Finally, this study is only a content analysis of the technologies of the website. It does not know how the online newspaper readers or the newspaper staffers, editors, or publishers would look at the web technologies and it does not examine why certain technologies are utilized more than others. The study can only provide some speculations on the reasons.

There are some areas of online newspapers that are worthy of investigation to provide more comprehensive knowledge for web practitioners, newsroom editors, and academic researchers.

First, a companion survey of the online newspaper's editors and publishers would allow for a better understanding why specific technologies are used or not used on the online newspapers. It would also provide a better understanding of the resources available in the newsroom to online editions and the expectations toward profitability and readership for the online papers.

Second, a comparative content analysis of the print newspaper and its online editions would allow researchers to determine the amount of content from the print newspaper reused on the website and the amount of new content generated for the online newspaper. Knowing the amount of content from the

newspaper used on the website would allow researchers to examine claims that print circulation gets cannibalized by offering the contents of the print newspaper on the website and explore any investment that newspapers are making to turn the online newspaper into a separate distinct product from the print newspaper.

Third, studies should also be conducted comparing technologies used on newspapers' websites with technologies used on television stations' websites especially in the area of multimedia technologies like audio, video, and flash animation. Television stations' websites compete directly with newspaper websites for readers. The implementation of online video should be more of a natural process for television stations who already have video than for newspapers who must develop new processes for producing video. If television stations' websites in the same market are not using multimedia, then newspapers have the opportunity to be the first in their market to provide multimedia content and garner a greater market share in online news.

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Appendixes

Appendix A

Metropolitan Statistical Areas in Arkansas

A listing of Metropolitan Statistical Areas in Arkansas as defined by the Office of Management and Budget of the White House in November, 2005.

MSA Name	States	Counties	Papers in MSA	Population
Fayetteville-Springdale-Rogers	AR-MO	Benton, AR Madison, AR Washington, AR McDonald, MO	3	347,045
Fort Smith	AR-OK	Crawford, AR Franklin, AR Sebastian, AR Sequoyah, OK Le Flore, OK	1	273,170
Hot Springs	AR	Garland, AR	1	88,068
Jonesboro	AR	Craighead, AR Pointsett, AR	1	107,762
Little Rock-North Little Rock	AR	Faulkner, AR Grant, AR Lonoke, AR Perry, AR Pulaski, AR Saline, AR	3	610,518
Memphis	AR-TN	Fayette, TN Tipton, TN Shelby, TN Desoto, MS Tate, MS Tunica, MS Crittenden, AR	1	1,205,204
Pine Bluff	AR	Cleveland, AR Jefferson, AR Lincoln, AR	1	107,341
Texarkana-Texarkana	AR-TX	Bowie, TX Miller, AR	1	129,749

*Information from the OMB at http://www.whitehouse.gov/omb/bulletins/fy05/b05-02_appendix.pdf accessed on November 1, 2005.

*Population information from the U.S. Census Bureau at <http://www.census.gov/population/cen2000/phc-t29/tab01a.pdf> accessed on November 1, 2005.

Appendix B

List of Daily Newspapers in Arkansas

Name	URL	Location	Circulation	Corporation	MSA	MSA
The Daily Siftings Herald	http://www.siftingsherald.com	Arkadelphia	2669	HarborPoint Media	N	
Batesville Daily Guard	http://www.guardonline.com	Batesville	8982		N	
The Benton Courier	http://www.bentoncourier.com	Benton	6256	Horizon Publications	N	Little Rock
Benton County Record	http://www.nwanews.com	Bentonville	15544	Wehco	Y	Fayetteville
Courier News	http://www.couriernews.net	Blytheville	4421	Rust Communications	N	
Camden News	http://www.camdenarknews.com	Camden	3840	Welco	N	
Log Cabin Democrat	http://www.thecabin.net	Conway	10271	Morris	Y	Little Rock
De Queen Daily Citizen	http://www.dequeen.com	De Queen	2289	De Queen Bee \	N	
El Dorado News-Times	http://www.eldoradonews.com	El Dorado	9628	Wehco	N	
Northwest Arkansas Times	http://www.nwanews.com	Fayetteville	20,803	Wehco	Y	Fayetteville
Times-Herald	http://www.thnews.com	Forrest City	4452	Times-Herald	N	
Times Record	http://www.swtimes.com	Fort Smith	38,438	Stephens Media	Y	Fort Smith
Harrison Daily Times	http://www.harrisondailytimes.com	Harrison	9555	CPI	N	
The Daily Siftings Herald	http://www.helena-arkansas.com	Helena	2,157	Liberty Group	N	
The Hope Star	http://www.hopestar.com	Hope	2840	HarborPoint Media	N	
The Sentinel-Record	http://www.hotsr.com	Hot Springs	18,065	Wehco	Y	Hot Springs
The Sun	http://www.jonesborosun.com	Jonesboro	24023	Paxton Media Group	Y	Jonesboro
Democrat-Gazette	http://www.ardemgaz.com	Little Rock	280,529	Wehco	Y	Little Rock
Banner News	http://www.bannernews.com	Magnolia	4040	Wehco	N	
Malvern Daily Record	http://www.malvern-online.com	Malvern	4,251	Horizon Publications	N	
The Baxter Bulletin	http://www.baxterbulletin.com	Mountain Home	11216	Gannett Co, Inc	N	
Paragould Daily Press	http://www.paragouldailypress.com	Paragould	4,548	Paxton Media Group	N	
Pine Bluff Commercial	http://www.pbcommercial.com	Pine Bluff	19405	Stephens Media	Y	Pine Bluff
The Courier	http://www.couriernews.com	Russellville	9,639	Paxton Media Group	N	
The Daily Citizen	http://www.thedailycitizen.com	Searcy	5686	Paxton Media Group	N	
The Morning News	http://www.nwaonline.net	Springdale	38,536	Stephens Media	Y	Fayetteville

Name	URL	Location	Circulation	Corporation	MSA	MSA Location
The Stuttgart Daily Leader	http://www.stuttgartdailyleader.com	Stuttgart	2278	Liberty Group	N	
Texarkana Gazette	http://www.texarkanagazette.com	Texarkana	33,990	Wehco Ricketson	Y	Texarkana
Evening Times	http://www.theeveningtimes.com	West Memphis	7877	Newspapers, Inc.	Y	Memphis

Information extracted from the 2005 Arkansas Press Association Directory

Appendix C

Newspaper Technologies Coding Instructions

These technologies will be coded on the following coding sheets. If you are not sure of a type of technology please refer to the operational definition of the technology below.

Forums:	A forum is online community where users can read and post information about common topics. A user interacts with a forum by submitting forms on a web page. Forums are also known as discussion boards or interactive message boards.
Chat rooms:	A chat room is a variation on a forum that allows for live synchronous discussion about a specific topic. The messages normally appear on a part of the web page next the user's nickname .
Related links:	Related links can be found on a web page as a link to other information or stories that is similar or related to the subject of that web page. A link is a URL embedded in the document so that if you click on the highlighted text another web page will be retrieved.
Video:	Links to video on a web page or video embedded on a web page allows the user to view a stream of images on the website through technologies such as Quicktime, Macromedia Flash video, Windows Media or Real Media.
Audio:	Audio on a web page or a link to audio is present where the user can hear music, interviews or other items streaming to their web. Audio is often presented through such technologies as Quicktime, Windows Media, Real Media or as a podcast.
Flash:	Flash is a vector graphic animation technology that is platform independent. Flash can be found on a website that presents users with moving and interactive graphics.
Email contact:	An email contact is found with the presence of email addresses on a page for the reporter or a clickable link which allows the user to send an email through an email client or through a web form.
Instant polls:	An instant poll asks the user a question and allows the user to choose from a number of answers and submit a form. Data from the respondents to the question is displayed on the screen. All users who visit the website are allowed to answer the poll question.
Photographs:	Photographs or photo illustrations are images of people, places or events that are editorial in nature and not an advertisement.
Text ads:	Text Ads are text links that advertisers pay to place on the web page.

Search:	Search is a utility that retrieves information on a search term that the user queries. The search utility can search the website a user is browsing or the whole World Wide Web
Email delivery:	Email delivery allows the user to subscribe to an automatic mailing list where the user will enter their email address and sign-up to have news stories emailed to them on a regular basis.
Non-traditional format:	A non-traditional web format of the newspaper allows the user to browse an electronic replica of the print newspaper through a web browser. Non-traditional web formats often use portable document format technology to display the print version of the newspaper.
Blogs or web logs:	A blog is a website where the author posts a chronological electronic journal of their thoughts pertaining to a specific topic. Blogs allow users to post comments about the author's posts.
Registration:	Users are required to enter demographic data and create a username and password to enter the interior pages of the site.
Subscription:	Users are required to pay to access the site either through a print newspaper subscription or an online only subscription.

Appendix D

Newspaper Technologies Coding Sheet

<<NewspaperID>> <<Newspaper Name>> - <<Web Address>>

Home Page

In the space provided please indicate the number of times each of the technologies are used or linked to from the home page. If you are not sure about the technologies, please refer to the coding instruction sheet. You must fill in each blank.

Forums: _____	Email: _____
Chat rooms: _____	Instant polls: _____
Related links: _____	Photographs: _____
Video: _____	Graphic Ads: _____
Audio: _____	Text Ads: _____
Flash: _____	

In the space provided please indicate the availability or unavailability of technologies on the home page or linked to the home page with a Y or an N. If you are not sure about the technologies, please refer to the coding instruction sheet. You must fill in each blank.

Non-traditional: _____	Blogs: _____
Search: _____	Email delivery: _____
Registration: _____	Subscription: _____

Top News Story Page

In the space provided please indicate the number of times each of the technologies are used or linked to from the home page. . If you are not sure about the technologies, please refer to the coding instruction sheet. You must fill in each blank.

Forums: _____	Email: _____
Chat rooms: _____	Instant polls: _____
Related links: _____	Photographs: _____
Video: _____	Graphic Ads: _____
Audio: _____	Text Ads: _____
Flash: _____	