Two Days Dedicated to Dodging the Memory Hole

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The year 2016 was the 15-year anniversary of the September 11, 2001 terrorist attacks in the United States. Unlike those who witnessed or experienced the traumatic events, students born after their occurrence have been learning about them as a history lesson. Textbooks have been updated to include this horrific tragedy that irrevocably changed history, albeit in a brief synopsis. However, to incorporate this material into the textbook or classroom curriculum, other content must be omitted. At the Dodging the Memory Hole 2016: Saving Online News forum (DTMH 2016), a graduate student compared these abandoned history lessons to the mass amount of news lost online each year in the "memory hole," an homage to the incinerator in George Orwell's "1984." In the novel, the memory hole was used to destroy historical documents as a means of state censorship. Much of contemporary society still believes that seemingly anything can be found online if you look hard enough. Unfortunately, that assumption is hardly accurate.

On Oct. 13 and 14, 2016, the DTMH series held its fourth event, this time at the Charles E. Young Research Library at UCLA. One hundred fifteen individuals attended the forum – a record number for a DTMH event – and as many as 230 people watched via Facebook Live broadcasts that occurred throughout the conference. The group in attendance included dozens of journalists, librarians, archivists, technologists and entrepreneurs from across the country (and one from India), all of whom gathered to discuss the importance of preserving born-digital news. The forum — hosted by the University of Missouri Libraries and the Donald W. Reynolds Journalism Institute (RJI), UCLA Library, and the Educopia Institute — also invited 14 graduate scholarship recipients, seven guest speakers, including Pulitzer Prize-winning journalist Peter Arnett, and three panels of experts. This white paper summarizes the DTMH 2016 event, with

synopses of the presentations and panels, details about the proposed national agenda for preserving born-digital news and projects proposed by working groups in attendance.

Day One

On the first day of the DTMH 2016 forum, students and professionals gathered early for breakfast and introductions. This DTMH event was the first to offer a travel scholarship program for graduate students studying library/information science, journalism, computer science and other fields related to the theory or practice of digital preservation. As previously mentioned, 14 students were awarded these travel scholarships, made possible, in part, by the Laura Bush 21st Century Librarian Program from the Institute of Museum and Library Services (IMLS), grant #RE-33-16-0107-16. Students hailed from seven different universities across the country – MU, New York University, University of North Carolina at Greensboro, Old Dominion University, Simmons College, University of Texas at Austin, and Wayne State University – each with the intent to help preserve born-digital news. Scholarship recipients are listed in Appendix A.

In order to do this, the hosts had to facilitate the conversation for insight on what is important to the preservation of online news. At meal times throughout the conference, attendees received brief surveys to complete. Although these findings were not compiled in time to share with the audience during the forum, the results are published here. One of the most interesting statistics from day one's breakfast survey revealed that more than two-thirds of participants placed a higher priority on news from the present day compared to news published 93 years ago. Other survey responses can be seen in Table 1.

Table 1. Which item is more important to you?	
Item	# of Responses
PDFs of printed news	12
WARCS of online news	23
News from 1923	9
News from 2016	23
Minority or underserved community news	22
Mainstream news content	12
Facebook	13
Twitter	8
New York Times	13
Los Angeles Times	10

To kick off the forum, Edward McCain, digital curator of journalism at MU Libraries and RJI, began with a warm welcome. After opening remarks from Ginny Steel, the university librarian at UCLA, McCain outlined the following goals of the forum:

- Produce and publish an outline for a proposed national agenda for preserving online born digital news;
- Identify concrete roles for each stakeholder required to accomplish this agenda;
- Facilitate cooperation and knowledge sharing between news technologists and digital preservation experts;
- Examine how technology platforms such as content management systems (CMSs) can be adapted to work with existing digital preservation infrastructure;
- Better prepare students, especially those in library science, archival and museum studies, and information sciences, for the digital preservation needs of 21st Century journalism;
- Identify specific projects that will advance online preservation practice today.

Following McCain's reminder of the event's goals, the keynote speaker, Hjalmar Gislason, vice president of data at business intelligence company Qlik and self-proclaimed technology enthusiast, took the stage. Gislason delivered the keynote address and asked the

audience, "What's Worth Saving?" He noted that data will continue to grow exponentially –

from a gigantic amount to "gargantuan" proportions – most of which will be discarded (Gislason,

2016). He described the habits of his in-laws – his mother-in-law who hoards everything and his

father-in-law who disposes of it. While people have no way of knowing what will be important

to future generations, hoarding all data is not a realistic strategy either. As for digital news,

Gislason urged stakeholders to decide what pieces of information are worthy of preservation.

McCain returned to announce a quick break and encourage attendees to participate in the

various polls and to comment on message boards in a nearby hallway. These message boards

asked the following questions:

- At what point in the creative process does it make sense to capture content (e.g.
  reporter's notes, first draft, edited drafts, published version, updates, revisions,
  corrections)?
- Who is responsible for saving online news content? Is it ever ethical to disobey
  copyright law in order to preserve it?
- Given the multiple channels for distribution (e.g. print, web, social), which versions
  of news content should be captured and saved?
- What are the main obstacles to saving born-digital news content published online?
  How do we overcome these?

Throughout the forum, attendees could add their opinions to these message boards. Some

of their responses are captured in Table 2. Most notably, many participants felt it was most

important to capture content in its published version only, discarding notes and drafts, although

some felt that preserving all versions thereafter, including updates and revisions, would also be

relevant to the archive. Fewer individuals weighed in on responsibility and ethics, but those that

did echoed it was everyone's obligation to preserve online news content. As for which channels

should be saved, there was a variety of responses advocating for print, web, visual and social

media; however, some entries were more ominous (e.g. entropy), elusive (e.g. who knows?), or

hopeful (e.g. everything!). The final, and perhaps most important, question asked participants to

identify the main obstacles to saving born-digital news content. Many of the responses aligned

with the six DTMH action areas, which will be discussed later. These ranged from lack of

funding and legal framework to issues with technology.

Table 2. Message Boards			
At what point in the creative process does it make sense to capture content (i.e. reporter's notes, first draft, edited drafts, published version, updates, revisions, corrections)?	Who is responsible for saving online news content? Is it ever ethical to disobey copyright law in order to preserve it?	Given the multiple channels for distribution (print/web/social), which versions of news content should be captured and saved?	What are the main obstacles to saving born-digital news content published online? How do we overcome these?
Depends on the type of content	It depends on the copyright law.	Open web "canonical" URLs	Bad filtering of the content
It makes sense to capture this content at all stages, the only prohibitive factor is the lack of practicality.	Online news content should be saved by those interested in the content and not necessarily the production agency. Copyright law should not come into play with individuals' presentation efforts. Fair use.	We won't know what's going to be most important later—but what is in a fragile state now that needs attention/solutions?	P. Quantity—Fortunately computing and storage are getting better, but we need more tech help to program a system.
First published version	Ideally, content owners are most responsible for saving their own content. Copyright law is not as important as preserving the most important content.	Everything	The lack of legal framework to protect archivists
News orgs should strive to capture all; memory orgs should work with them to expose it.	Everyone should be able to save what they consume. We have an ethical obligation to do so!	Lowest bandwidth content first	Lack of adaptability to modern technology platforms
As early as possible—notes, research, and beyond	Everyone is responsible for saving it. Nothing should stand in the way of saving something if it's needful.	Video—People can relive history.	Make archive available to all publishers to send their publications to
Published version, updates, and corrections at a minimum		Print and web at least—Most publications are web now.	Economic incentives
From the pre-creative content moment (i.e. the initial research stage)		Social news—The most influential	Money / (financial incentives) and successful models that can inspire others
From published version onwards		Entropy will eventually get it all...	Obsolete technology—Create emulators/virtual machines.
Version control—Save it all!		Print, for as long as it exists	Overwhelming amount of news content and technical difficulties

After the break, everyone reconvened in the main conference room for the first panel. It appropriately followed with another important question: "Why save online news?" This panel consisted of the following individuals: Chris Freeland, associate university librarian at Washington University in St. Louis; Matt Weber, Ph.D., assistant professor at Rutgers' School of Communication and Information; Laura Wrubel, software development librarian at George Washington University; and moderator Ana Krahmer, Ph.D., director of the Digital Newspaper Unit at the University of North Texas. The panel emphasized the importance of saving digital-only media, as there is no offline medium. However, the reality of online news preservation can also be somewhat disheartening. According to Weber, it is unlikely that publishers as a whole will donate their intellectual property to memory institutions due to economic considerations.

Next to present, Tim Groeling, Ph.D., an associate professor and chair of the department of communication studies at UCLA, shared how he and his colleagues are doing their part to preserve TV news with NewsScape – a collection of more than 200,000 streaming news programs from the Los Angeles area since 2005. It is the largest collection of TV news and public affairs programs – local and national, according to Groeling. The UCLA Library, which has supported the collection and storage of the recordings for the project, launched the educational tool in 2013, but the project truly began decades earlier during the Watergate scandal of the 1970s. Operating on a shoestring budget of $10,000 and volunteer labor, the team recorded local and national TV news that aired in Los Angeles (Groeling, 2016).

Fast forward a few decades, the budget has not grown much – now $20,000 – and the

labor is still predominantly voluntary. Groeling now leads the effort to digitize analog media at

UCLA, supervising a part-time lab manager and ten work-study students, hoping to preserve

20th century political history. Together, they digitize hundreds of hours of taped audio and video

recordings. Groeling feels it is imperative to transfer these tapes to the digital space given the

deterioration and imminent extinction of these analog artifacts. He and his crew originally

planned to share the content only on the university's website but eventually moved it to his

department's YouTube channel, which receives 77 percent of the traffic. He hopes that someday

it will become useful to those outside UCLA – and that the content will be analyzed to better

understand patterns of news coverage (Groeling, 2016).

When the forum adjourned for lunch, attendees received a short survey (see Table 3). In

this poll, an overwhelming majority supported the preservation of text over other forms of

storytelling, which suggests that the written word still carries a high value.

Table 3. What is the most important news format to save?	
Format	# of Responses
Audio	4
Photo	1
Text	35
Video	19
Other	4

Later, attendees divided into 14 pods (i.e. groups) – ranging from two to ten individuals –

for breakout sessions. The purpose of the first session was to devise a national agenda for

born-digital news content by refining key initiatives in the six DTMH action areas: Awareness,

legal framework, policy, resources, standards and practices and technology. These action areas

were compiled and voted upon during the DTMH 2014 forum. The following sections highlight

some initiatives generated in each action area during the DTMH 2016 forum.

Awareness. Perhaps one of the easier initiatives to undertake, stakeholders should spread

awareness about the implications of failing to preserve born-digital news. One speaker asked,

"How do we get people interested in the problem?" For starters, events such as DTMH 2016 will

bring attention and interest to the problem. Publishing written and video content about research

into the loss of online content, especially on a digital forum, can also reinforce the necessity for

thoughtful discourse and action. Other suggestions from the forum included social media

promotion (such as Facebook Live and Twitter, which were both used at DTMH 2016), as well

as hosting events to educate the public, news organizations, government officials and creating

business models for organizations to license their archival content. If profitable, these

organizations could then receive a financial incentive to implement a process that archives,

preserves and distributes content.

Legal Framework. Pursuing a legal framework for born-digital content is a complex

undertaking. The question of content ownership arises right away and tracing ownership of

intellectual property can be difficult. Think of it as a game of telephone – while the content may

remain intact, the identity of the original owner or creator may get lost in translation on the

internet, which can interfere with our ability to comply with the copyright process. Given this

and other challenges, stakeholders should establish goals and objectives for addressing copyright

issues such as changing laws, privacy concerns, social media content and ownership of archives.

In addition, many DTMH 2016 attendees called for a review of digital copyright laws in

an effort to preserve born-digital news content for public welfare. They would like to see a

revision of Section 108 of the U.S. Constitution, which allows libraries to copy materials for the sake of preservation. Last year, the U.S. Copyright Office (2016) invited interested parties to discuss potential revisions in an effort to finalize its legislative recommendation. While it is imperative for stakeholders to participate in forums like this, they must continue pressing the U.S. Library of Congress (LC) and/or Congress itself to implement mandatory born-digital legal deposit in the United States, which requires congressional authorization and funding.

Policy. Many DTMH 2016 participants also felt there should be a federal initiative for the preservation of public records through news archives or at least a "pledge" for news organizations to acknowledge the importance of archives. In the case of the former, if a few prominent individuals publicly led this initiative, determined a budget commitment (though not necessary) and applied frameworks to assess the level of digital archiving to news archiving, other media organizations might follow suit. The first step toward change involves action.

However, changing policy is more difficult than it seems. In fact, Orwell's "1984" may not be so fictitious after all. Kalev Leetaru, creator of the GDELT (Global Database of Events, Language, and Tone) Project and a senior fellow at The George Washington University, believes government officials impede steps toward preservation because it would allow watchdogs to fact-check them more easily (Shein, 2016). Similarly, the "Right to be Forgotten" law in the European Union permits citizens to request the removal of content from major search engines' search index (Shein, 2016). Both examples suggest that stakeholders need to convince those in power to influence and improve policy.

Resources. The Blue Ribbon Task Force on Sustainable Digital Preservation and Access (2010) hopes to see a mobilization of resources – namely human, technical and financial.

Likewise, many DTMH 2016 participants called for voluntary contributions from stakeholders –

donating their time, expertise and money to digital news preservation. A little time and a lot of

knowledge can go a long way in educating others on how to effectively preserve their content,

and money, of course, can grease this process.

According to Rhodes & Neacsu (2009), the lack of funding, staffing and expertise has

limited digital preservation at libraries, but the same is likely true at media organizations. In this

case, surveying current efforts in online news preservation outside the Library, Archive, and

Museum (LAM) space might generate some new ideas for acquiring resources. In the meantime,

Gracy & Kahn (2012) direct attention to the Association of Research Libraries (ARL), the

Council on Library and Information Resources (CLIR), the Educopia Institute and OCLC

Research for information on digital preservation efforts in the United States.

In addition to these sources, DTMH 2016 attendees suggested creating a repository of

resources and tools to aid such actions. The Chronicles in Preservation project – funded by the

National Endowment for the Humanities (NEH) and led by the Educopia Institute, has already

developed one such resource: "Guidelines for Preservation Readiness of Digital Newspapers.".

This project studied the preservation readiness of newspaper collections that had been digitized

from print and identified challenges facing digital preservation (Krabbenhoeft, Skinner, Schultz,

& Zarndt, 2013). Many of the same issues identified in the Educopia paper apply to born-digital

content, but key areas including capture, formatting and long-term access remain problematic.

Standards & Practices. Similar to acquiring resources, stakeholders should develop,

implement and streamline standards and practices to combat born-digital news' obsolescence.

According to the Information Governance Initiative (IGI), organizations need to standardize the

long-term protection and accessibility of digital information by creating and enforcing rules

(Information Governance Initiative LLC, 2016). However, Dryden (2014) insists that these

"standards don't stand still." They evolve constantly (and significantly) and require ongoing

maintenance – regular reviews and revisions to ensure their relevance to current users and their

compatibility with national and international standards (Dryden, 2014; Krabbenhoeft et al.,

2013).

One suggestion at DTMH 2016 was to implement IPTC standards (Schema.org, RDFa,

microformats, etc.). IPTC – which consists of more than 50 companies, organizations and

associations from the news industry – and has served as the Global Standards Body of the News

Media for more than 50 years. This group seeks to simplify the distribution of information by

making its standards free to members and the wider community. Those interviewed in the

aforementioned Chronicles in Preservation project, as well as the IGI, also referenced standards

such as the Open Archival Information System, or OAIS (Information Governance Initiative

LLC, 2016; Krabbenhoeft et al., 2013). The Consultative Committee for Space Data Systems

(CCSDS) created the OAIS Reference Model and made it freely available on its website

(Dryden, 2009).

In addition to standards, stakeholders need to share best practices. For instance, various

organizations, such as the Internet Archive and the LC, have decided to work together for online

news preservation (Shein, 2016). Many DTMH 2016 contributors, as well as other experts such

as those on the Blue Ribbon Task Force (2010), agree that creating public/private partnerships is

a top organizational action item. When different sectors/institutions collaborate, they can

standardize how content is archived – for example, archiving at the point of creation, which can

save time (and, inevitably, money) later. To standardize content archiving, Hurst-Wahl (2009)

suggested a universal set of guidelines derived from the same best practices that translate across

different types of organizations. One such example is the IGI's Annual Report, which serves as a

reference guide for organizations building their information governance programs (Information

Governance Initiative LLC, 2016).

      Technology. Regarding this last action area, Vint Cerf – the "father of the internet" and

now-vice president of Google – said society has entered a "digital Dark Age" in which future

generations will have little to no record of the 21st century because the vast majority of

information is stored in a digital format (Shein, 2016). As technology evolves, so do the means

of storage. Think about all the documents saved on a computer's hard drive. If the user does not

backup those files before replacing the computer, the user may never retrieve them or be unable

to once they want to. According to a 2016 survey from IGI, 97 percent of respondents are aware

that digital records may become unreadable or unusable, and nearly a third (31 percent) of them

have no strategy to combat this potential loss of content (Information Governance Initiative LLC,

2016).

      Fortunately, DTMH 2016 attendees listed a variety of technological initiatives to

kickstart these improvements. Creating partnerships was already identified as a best practice, but

stakeholders will want to work with computer science/design schools, in particular, to create

prototypes of software in order to improve archiving. This relationship is critical to the

development of new technologies that can simplify and enhance preservation strategies.

      Stakeholders should also encourage education and training in technology-related

competencies as an investment for digital preservation in the future (Blue Ribbon Task Force,

2010). In doing so, they should try to develop their own technological solutions – for instance, creating a plugin that can backup dynamic news sites as static HTML pages in addition to the standard database backup. DTMH 2016 participants also suggested using open-source software such as Application Programming Interfaces (APIs) to minimize the need for expensive consultancy work and improving methods for the automated self-deposit of archival content.

Once groups compiled their list of initiatives, they proceeded to breakout session two where each team prepared a project, based on the aforementioned initiatives, to advance the practice of online news preservation. Although all ideas were unique, many shared common goals, such as creating tools or technologies for archiving. For example, Pod 2 called its project "Web Archiving Case Studies (or, WACS)," with the goal of creating a central knowledge base of web archiving best practices. This idea would allow contributors to provide, and initially populate, a central knowledge base for those who are starting to web archive in an effort to advance this skill. The knowledge base would consist of a number of case studies highlighting solutions to common problems, such as legal issues, technical hurdles, etc. The group felt that this would facilitate the sharing of best practices and encourage organizations to archive their content. A similar project suggested creating a case study on how to archive born-digital news from a newspaper's website.

Meanwhile, Pod 3 found inspiration in the recent pop culture phenomenon, Pokémon Go, with "Every Place Has a Story." This project would utilize an augmented reality (AR) of the temporal past through geophysical location, and archival news content would be geotagged and displayed through an app based on the user's location. It would provide an interactive experience

for mobile app audiences, as well as a potentially profitable outlet for news organizations'
archival material.

Other groups, like Pod 7, wanted to facilitate partnerships across stakeholders while
raising awareness and standardizing practices. The project, "Hacks and Hackers and Librarians,
OH MY!", would formalize and broaden communication between technical communities within
library and media organizations. A few ways to do that include the following: organizing
conferences (such as the DTMH forums) to get stakeholders talking; broadening the audience for
these conferences by using internet and social media; creating a formal structure to establish
what each technologist brings to the table; bridging archival practices at libraries and media
organizations and building relationships with large data and technology companies for their
input. Related projects also suggested leveraging local meet-ups, events, and "hackathons" to
bring together technologists, journalists and librarians to collaborate and share issues relevant to
news preservation.

The final project outlined in this white paper, "No Results Found" from Pod 14,
specifically focused on increasing student involvement by raising awareness about how much
online content goes unarchived. This group thought a campaign targeting high school and college
students would be effective at showing how much of their lives might be lost in the memory
hole. The campaign would utilize a website where students can create online content, perhaps in
a journalism class,and then assess how much of it is vulnerable to loss and link rot, in which
hyperlinks fail to route to the intended website. In conjunction with this hands-on tool,
stakeholders would also speak to media and/or history classes to reiterate the importance of

online news preservation. The team thought this might inspire students to take action,

particularly through their career choices.

Following a brief recess, the groups presented all projects to the entire forum. Many of

those in attendance remarked at how impressed they were that students cared so much about the

issue of born-digital news preservation.

For the last speech of the day, Clifford Lynch, Ph.D., the executive director of the

Coalition for Networked Information (CNI), an organization composed of approximately 230

institutions dedicated to the use of digital information technology to advance scholarly

communication, put born-digital news preservation into perspective. Lynch elaborated on issues

facing online news preservation, such as link rot. Lynch also debunked the misconception that

the Internet Archive – a non-profit library with millions of free media – has cataloged everything

on the web. "It's not a total solution," he said. Instead, he called for multiple archives (Lynch,

2016).

To conclude day one, McCain – on behalf of RJI, MU Libraries, and IMLS – recognized

the 14 scholarship recipients during a reception at Powell Library on the UCLA campus.

Students were introduced by their mentors, who shared the students' backgrounds and research

projects for their scholarships. From there, students, mentors and guest speakers attended a

private dinner off campus, where they shared personal experiences that led them to participate in

DTMH 2016 and advocate for born-digital news preservation. For example, numerous

individuals reported feeling melancholy after losing their online collegiate publications/video

content. To them, it represented a personal piece of history – a part of their legacy that they could

share with friends, family and forthcoming generations. Others humorously expressed relief at

not being able to revisit those early years of naiveté and inexperience. Regardless, neither group

would likely have the opportunity to revisit those creations, as they may have been lost forever to

the memory hole.

Day Two

The next morning, DTMH 2016 participants completed another survey (see Table 4).

Before the agenda commenced, McCain and Sharon Farb, an associate university librarian at

UCLA, welcomed everyone back for day two. Farb urged everyone to think about the role

journalism and journalists have played in their lives and the history they should want to preserve.

Table 4. Which of the following should be legally allowed to ignore robots.txt requests?	
Option	# of Responses
Universities	8
Non-profits	6
Internet Archive	7
Library of Congress	11
Which is more important to save?	
Option	# of Responses
Dark archives of the *Los Angeles Times*	16
Publicly available archives	9
The meaning of news content	14
The appearance of news content	7

Then the first speaker, Michael Nelson, Ph.D., a faculty member in the computer science

department at Old Dominion University, summarized archival collections using storytelling

techniques. Nelson discussed Archive-It, a subscription-based service designed by Internet

Archive to help organizations create web collections. Unfortunately, collection understanding

and summarization are not currently supported. Nelson noted that early attempts at collection

understanding tried to include everything, which was not effective for sharing important

information (Nelson, 2016). As a result, archivists began using elements of storytelling by arranging webpages in time; this particular method is used in social media. Nelson also highlighted the work in doctoral student Yasmin AlNoamany's dissertation, "Using Web Archives to Enrich the Live Web Experience Through Storytelling." AlNoamany's Dark and Stormy Archive (DSA) framework uses the aforementioned elements of storytelling by blending webpages from archived collections with visual social media tools (AlNoamany, 2016).

Following Nelson's presentation, special guest speaker Peter Arnett captivated the forum with his personal experience of covering the Vietnam War and how he preserved a piece of history by keeping the Associated Press (AP) Saigon bureau's archives. Arnett shared how he and those at the AP office kept hard copies of their stories, even the ones that were not published. The AP had no interest or means of preserving these documents, so Arnett took it upon himself to "dispose" of them – by shipping dozens of deliveries to his apartment. When he relocated, the files went with him. Eventually, he wrote his biography, "Live from the Battlefield," which drew largely from this material. Arnett said he probably would have retained all of the documents in their original form forever, but the AP appointed an archivist "to straighten out its news production history," something he felt should have been done years ago (Arnett, 2016).

The first panel of day two, titled "Kiss Your App Goodbye: The Fragility of Data Journalism," consisted of the following people: Meredith Broussard, an assistant professor at the Arthur L. Carter Journalism Institute at New York University; Regina Lee Roberts, a bibliographer for anthropology, feminist studies, Lusophone Africa, and sociology at Stanford University Libraries and Academic Information Resources; Ben Welsh, a writer and database

producer at The Los Angeles Times; and moderator Martin Klein, Ph.D., a scientist at the Los

Alamos National Laboratory.

Broussard began by explaining how it is difficult to archive news apps because their

content does not live in CMSs, which typically are designed to assemble and publish print and

digital products using text, photos, graphics and video. A news app, she said, allows users to put

themselves into the story. Welsh followed up with his work at The Los Angeles Times' Data

Desk and reiterated the need for archiving tools (like Memento) and simplified access to

archived material. Most importantly, he advocated to have archiving baked into the systems; he

believes self-archiving sites would make the whole system stronger (Welsh, 2016).

Rounding out the panel, Roberts wanted the audience to think about the data. She referred

to journalists as "data liberators" – cleaning it, visualizing it and turning it into a story – but then

she asked, "What happens to the data?" (Roberts, 2016). Like her peers, Roberts discussed the

work being done at her institution. Through a grant, Stanford has partnered with a collaborative

network to establish an open source digital repository, known as the Big Local Digital

Repository (BLDR), with the intent to preserve "state and local data sources that foster increased

accountability, transparency, and civic engagement" (Kasianovitz, 2016).

Next, attendees received their final survey question, one that served as a call to action (see

Table 5). For at least one individual, though, the first step meant multiple actions, hence the

halved responses.

Table 5. What first step will you take to save online news?	
Answer	# of Responses
Talk to the editor or publisher of my local paper	15
Post about DTMH 2016 on social media	10.5
Write an article for my professional community	14.5
Give a presentation at my organization	13

After lunch, the final panel of the forum, led by The New York Times Technology Team, shared the groundbreaking work it has done for the newspaper's digital presence. The Team, comprised of Evan Sandhaus, Jane Cotler, and Sophia Van Valkenburg, started with a demo of the "TimesMachine," a virtual microfilm reader with more than 150 years of The New York Times journalism as it originally appeared. Originally, the site only included issues published between 1851, (when the newspaper was founded), and 1980; but in early 2016 the Team expanded the site adding issues from 1981 to 2002. This compilation now includes 12.4 million articles over 4.1 million pages (Cotler & Sandhaus, 2016). Van Valkenburg discussed why The New York Times wanted "to modernize the presentation of archival data," launching a redesign of the digital platform in 2014 (Van Valkenburg & Sandhaus, 2016). Likewise, Cotler described how removing some data led to a better user experience.

In addition to the scheduled speakers, the forum hosted a lightning round where eight individuals gave three-minute overviews about their initiatives in the pursuit of content preservation. For one, Mark Graham, the director of the Wayback Machine, gave a presentation about one of the Internet Archive's key services, a three-dimensional index that archives content and browses new and old websites (Shein, 2016). The Wayback Machine, which was created by the founder of the Internet Archive, Brewster Kahl, was a topic of conversation throughout the conference. More than 600,000 people access the site daily, which adds approximately one billion pages each week (Shein, 2016). The Wayback Machine allows users to access the "Save Page Now," service which has the ability to capture a webpage in its current state so that it can

be retrieved later. In addition, the site intended to implement site search before the end of 2016 to improve search results.

Afterward, Kate Zwaard, the chief of National Digital Initiatives at the LC, shared how her office is seeking partnerships with other libraries to maximize the benefits of digital collections. She hopes her work will "incubate, encourage, and promote digital innovation" (Zwaard, 2016). Zwaard also highlighted an event hosted by the LC in September 2016, called Collections as Data, where they talked best practices and engaged the community in a discussion about how to foster an interest in the digital humanities (Library of Congress, 2016).

The conference momentarily stopped for a break, which gave attendees the opportunity to decide which final 40-minute breakout session to attend. Their options included a presentation from Jefferson Bailey, director of Web Archiving Programs at the Internet Archive, discussing "Web Archiving for News;" one from Welsh on "News Apps;" another from Eric Weig, a digital library architect at the University of Kentucky on "Working with CMS;" and a more in-depth session on the GDELT Project first presented by Leetaru during the lightning round.

The final presentation of the forum, "Alignment and Reciprocity," came from Katherine Skinner, Ph.D., executive director of the Educopia Institute, a nonprofit organization that seeks to build networks and encourage collaboration among cultural, scientific and scholarly institutions and one of the co-sponsors of the DTMH 2016 forum. She described alignment as a transformative tactic: "Change depends on the support of networks of people" (Skinner, 2016). Through this alignment, stakeholders can achieve reciprocity. Skinner concluded with some quotations from her fellow speakers, like Gislason's words of wisdom: "There is a crucial

relationship between accountability and preservation" (as cited in Skinner, 2016). She left the audience with some suggestions for putting the DTMH 2016 ideas into action (see Table 6).

Table 6. What Can We Do?		
Create a registry of digital news preservation	Coordinate with associations serving each stakeholder community	Produce more plugins for preservation for major platforms
Collect social media as primary source material	Create and test business models for preserving news	Assemble news hackers and lib/archive hackers
Produce advocacy pieces designed for specific audiences	Forward working models	Talk to local media and report back

Source: Skinner, 2016

At the conclusion, McCain thanked everyone for attending, and Todd Grappone, an associate university librarian at UCLA, left the audience with closing remarks, reminding everyone that preservation is an immediate and necessary concern.

Impact Evaluation

The conference organizers conducted surveys immediately before and after the DTMH 2016 forum in order to collect information about the impact of the conference on attendees. Of the approximately 115 people who attended the conference, a little over 40, or about one-third responded to the survey. The full survey results are available in Appendix D, but here are some highlights:

- About 11 percent of respondents indicated that they identify with a minority community.

- About 48 percent of respondents indicated that their organization serves both minority and underserved communities.

- About 11 percent of respondents indicated that they were journalists and about 24 percent of respondents indicated that they were information technologists.
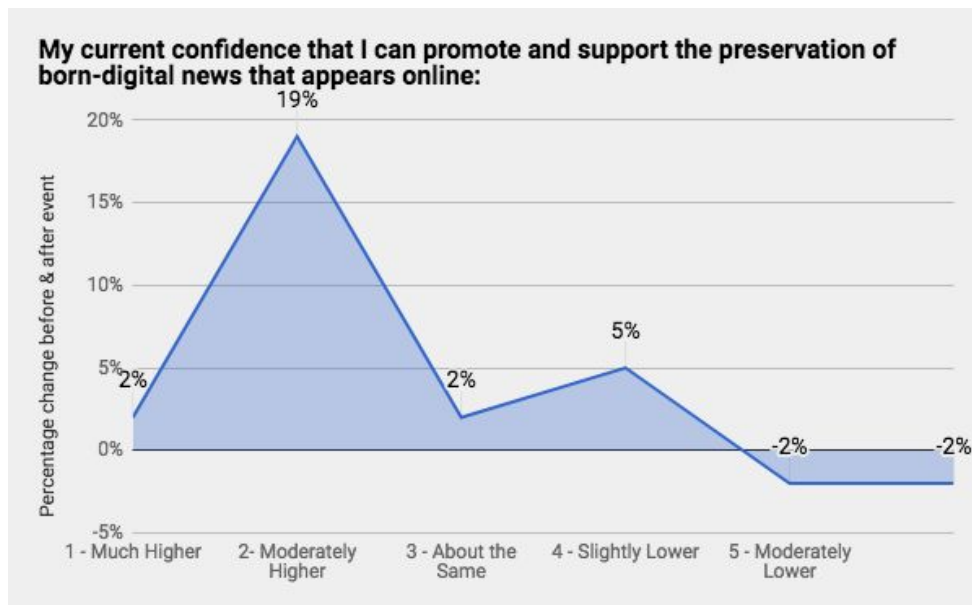
The following charts give a visual display to the change in responses from before attending the event to after attending it. Although the results of the before and after surveys are open to interpretation, it seems clear that the DTMH 2016 forum had some relatively dramatic effects on the attendees.
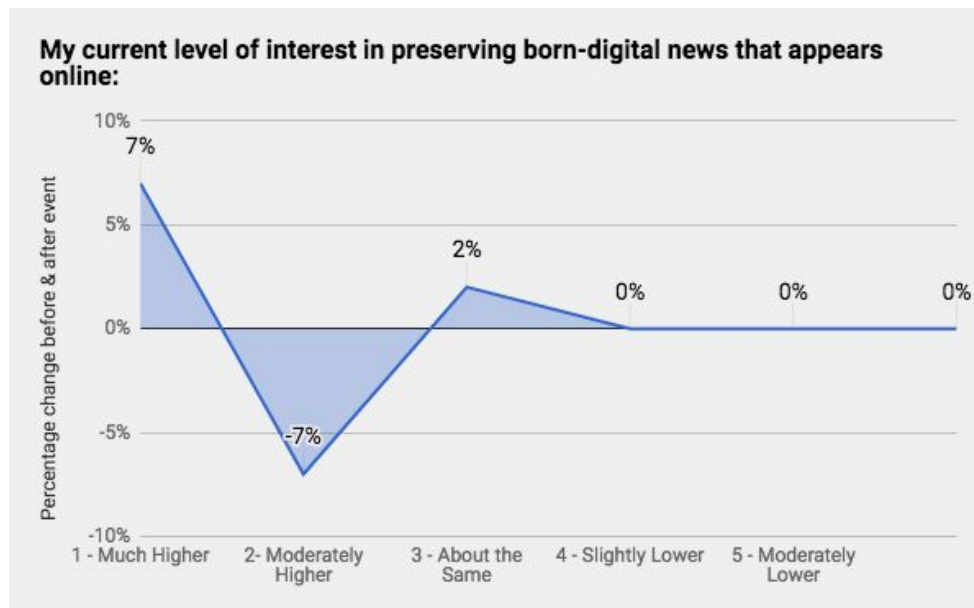
In terms of interest level, the respondents indicated a 7 percent increase in those with a much higher level of interest, but a 7 percent drop in those with a moderately higher interest level. This may indicate a shift in interest level from moderately higher to much higher.

My current level of optimism about the ability of U.S. institutions to preserve born-digital news that appears online for as long as it is needed:
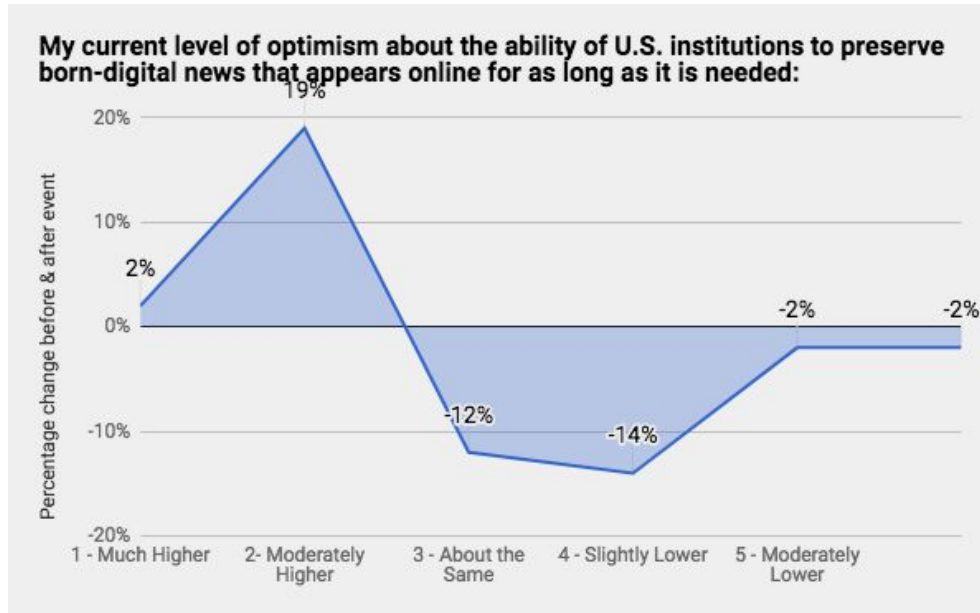
The level of optimism about the ability of U.S. institutions to preserve born-digital news content was divided: the percentage of respondents with a moderately higher level of optimism rose by 19 percent, while those responding with optimism levels that were about the same or slightly lower declined by 12 percent and 14 percent, respectively.

My current confidence that I can promote and support the preservation of born-digital news that appears online:

Survey respondents indicated that, on an individual level, they generally had higher confidence of their abilities to promote and support preservation of online news content. The highest level of increase was in the Moderately Higher category, which showed a 19 percent increase, while other categories showed much smaller changes. About 5 percent of respondents said that they had slightly lower confidence levels.

My current understanding of the critical issues involved in preserving born-digital news that is published online:
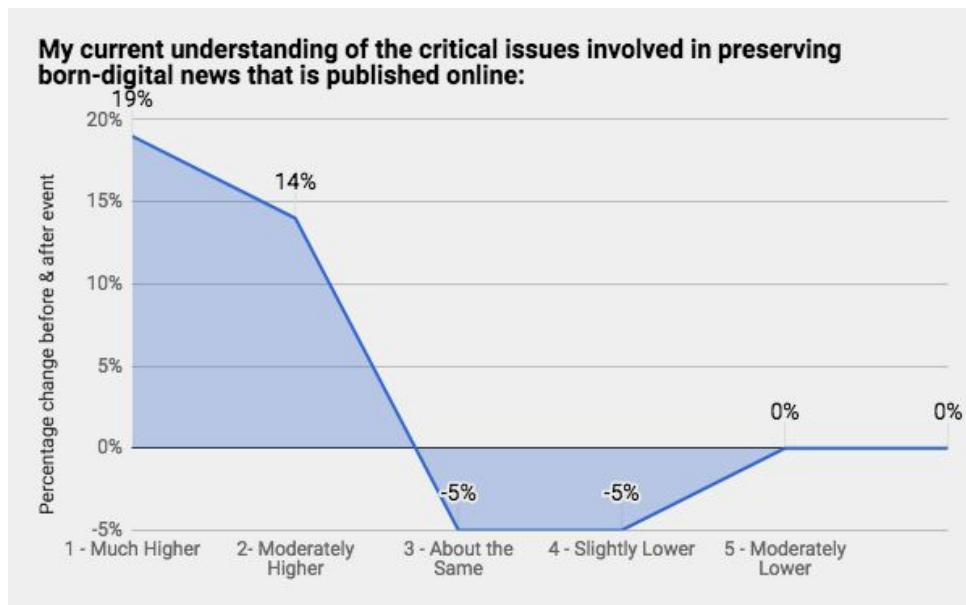
In terms of current understanding of critical issues involved in online news preservation, survey respondents indicated a high level of change on the positive side. The percentage of attendees indicating Much Higher or Moderately Higher levels of understanding rose by 19 percent and 14 percent, respectively.

In general, the results seem to indicate that the DTMH 2016 forum had a positive impact on the attendees who chose to answer the before and after surveys.

Summary

Bringing the event to the Los Angeles area provided easier access to participants from California and other western states. By locating DTMH on the UCLA campus and in proximity to the Los Angeles metropolitan area, the event was available to diverse communities. The excellent facilities, especially the networked "pod" setups at UCLA's Charles E. Young Research Library allowed for an innovative and efficient approach to working with groups of participants in order to gather and process input about important conference topics.

Scholarships allowed 14 graduate students from a variety of disciplines to attend, learn about the importance of preserving born-digital news content and to produce projects in support of the conference goals. Graduate students' exposure to the event and to the variety of stakeholders supports the goal of educating a younger generation of academics and potential stakeholders on the issues pertaining to born-digital news preservation, allowing for the continuation and advancement of conference goals.

The attendance and participation of Pulitzer Prize-winning journalist Peter Arnett created a deeper understanding of the lasting significance of news archives and elevated the gravitas of the discussions at DTMH 2016.

Compared with earlier forums in the series, DTMH 2016 showed an increase in the number of computer scientists and technologists, which helped broaden and diversify the community and increased the potential impact of the forum.

The inclusion of a panel presentation from The New York Times Technology team provided an exciting and informative look into one of the world's premier news archives, including the challenges of working with content published both in print and online.

The established DTMH action agenda was supplemented with ideas from the work groups that address more of the specific needs involved in saving online journalism. The groups also came up with an interesting list of potential projects that could advance the practice of news preservation.

The combination of speakers, panelists, group activities and informal networking activities provided an atmosphere rich with possibilities for advancing born-digital news preservation. The budding community that has been built around Dodging the Memory Hole continues to grow. This event helped sustain that community and advance the important conversations that are needed in order to find solutions to the challenges involved in saving online news.

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ollaborators-and-friends

Appendix A

DTMH 2016 Scholarship Recipients				
Last	First	Project	Location	Academic Major
Allman	Chris	Improving digital preservation guidelines for an upstart, born-digital local news outlet,www.charlotteagenda.com.	The University of North Carolina at Greensboro	Library and Information Science
Berlin	John	"Automatic news feed monitoring and preservation through the Web Archiving Integration Layer or (WAIL)."	Old Dominion University, Norfolk	Computer Science Masters
Britt	Terry L.	A scholarly research article documenting and detailing discussion and efforts at advancing the proactive measures needed to assure the lifespan and accessibility of local or regional online news content.	University of Missouri, Columbia	Second-year PhD student in Journalism
Carbajal	Itza A.	Documentation of the various measuring tools for web archivability as well as assesses the readiness of some of the nation's top news providers.	University of Texas School of Information, Austin	Information Studies
Choi	Jiwon	Forum sessions with MU international students from different backgrounds and majors who is concerning the issues of online media content conservation and solutions.	University of Missouri, Columbia	Convergence Journalism
Guillory	Alison Arleigh	Timeline of digital news content from WABE (Atlanta NPR member station) that will look at which digital formats have	Wayne State University, Detroit	Masters of Library & information Science (MLIS)

		preserved content and which formats have not.		
Hellman	Matt	Analyze the implementation of an open-source digital asset management system, through a case study with the Columbia Missourian newspaper	University of Missouri, Columbia	Journalism
Jones	Shawn M.	Test to see if articles that are shared via social media are more likely to be discovered by the archiving crawling software, and thus have a better chance of being archived more often and more quickly.	Old Dominion University, Norfolk	Computer Science
Kelly	Mat	Private, public, personal, and institutional web archives have no system in-place to integrate, aggregate, and provide access control to those archives that may require it; which my project will address.	Old Dominion University, Norfolk	PhD Student of Computer Science
Revear	Eva	Academic paper reporting the results of an environmental scan to determine which news apps currently exist, and on which technology platforms they are built.	New York University, New York	MA, Studio20:Digital First Journalism
Soltys	Hanna	Research paper on more complete preservation packages, including data visualization, media-rich video, interactive layouts, and commentary happening across social platforms.	Simmons College, Boston	MS in Library and Information Science, Archives Management Concentration
Vargas	Carolina	Video to stress the importance of this issue to students who will have careers in the media field and help to provide options for	University of Missouri, Columbia	Masters in Journalism

		how to take steps to remedy this problem.		
Wilner	Tamar	Paper to address the problem of inaccurate and outdated stories. This report will explore issues related to corrections in the online news environment.	University of Missouri, Columbia	Journalism
Zirk	Elizabeth	Author a white paper about the DTMH 2016 event.	University of Missouri, Columbia	Master of Arts in Journalism with an emphasis in Strategic Communication

Appendix B

Dodging the Memory Hole 2016: Saving Online News

Ideas for a proposed national agenda for preserving born-digital news online

Standards & Practices

1. Create a W3C working group for recommending best practices and standards for news archiving
2. Registry of tools: how can participants find tools that others have created to help with their preservation work? (example: Github Awesome Lists)
3. Develop resources and infrastructure for news article "peer review" (e.g., /r/worldnews /r/news -- Redditors comment on news articles, note when things are inaccurate, links are dead, etc., can we scale this out?)
4. Create simple recommendation list of best practices for news orgs.
5. Generalize the U of North Texas tools and practices for common use.
6. "CobWeb" (a collaborative collection development platform for web archiving)
7. Preserving context: test a model for preserving the historical context of news in addition to the news itself
8. Identify common technologies/tools and collaborate rather than "reinventing the wheel" and "creating one-offs"
9. Metadata standards (best practices and new tools)
10. Central repository/hub of resources/tools/people to share
11. An overview of leading archiving approaches
12. Develop library school / journalism school course in preservation of born-digital news

Technology

13. Contextual archive embedding via AI
14. Hacks and hackers + code4lib meetup and joint conferences
15. Data handshakes: find a way of bridging the standards between library and media archival practices AND PROVIDE INCENTIVES FOR DOING SO

16. Make open source the code for news archives applications (for example like the NY Times TimesMachine), to help smaller organizations benefit from that work and make their archives more visible.
17. Better methods for automated self-deposit of archival content
18. Creating technological infrastructure and support to address standards-based preservation policies
19. Identify commonly used platforms for smaller newspapers and build archiving capability into their workflow.
20. Find a technical solution for archiving, preserving, and distributing these projects
21. Create a working group with technologists to help improve archiving software and hardware

Awareness

22. Educating news organizations/decision makers
23. Advocacy for more responsible news practices online; involve the Electronic Frontier Foundation (e.g., recording instances of online censorship)
24. Develop communications plan targeting news execs, technologists, librarians and public.
25. Expand "http://savenews.org/" to document the loss of news content (crowdsourced?)
26. Make journalists aware of broken references in/to their own articles
27. Get more student involvement in taking on the challenges of data/media/IP law
28. Showcase Partnerships and Exemplars
29. Content-Creators: Knowledge that what they create should be preserved (journalists, app designers), buy-in & adoption on the part of the journalism culture; all content-creators have value to contribute/preserve
30. Administrative buy-in for: space, staff; or individual access to resources to support preservation
31. Engage commercial vendors such as Ancestry, NewsBank in the conversation about preserving content.
32. Increase awareness of preservation importance within news organizations
33. Local Outreach (awareness between archivists and communities)
34. Create a campaign for high school and colleges where people can see how much of their lives might be lost with the memory hole

35. "Pledge" for acknowledging the importance of archives in your news organization. Get a few prominent ones on board to publicize. Could include a budget commitment, apply frameworks for assessing level of digital archiving, to news archiving.
36. Local Meetups or working with existing local meetups to share issues relevant to saving news. Not just single-profession meetups, but across groups. Foster communication across news organizations, cultural heritage organizations, data science community.

Policy

37. Review of digital copyright laws for cases of preservation for public welfare.
38. Federated Collaboration between Institutional Repositories (Access & Preservation)

Resources

39. Business models: survey existing business models on the corporate and academic fronts; establish a sustainable framework for education / research
40. Encouraging veterans, retirees, etc to donate time and expertise toward archiving.
41. Toolkits/Recipes
42. Pilot an archive with a news org that we can leverage for funding and scale.
43. Find a business model for monetizing news app archives

Legal Framework

44. Who owns the content?: establish guidelines for addressing copyright questions re: changing laws, privacy, social media / ownership of archives and 3rd parties
45. Organize campaign to press Library of Congress / Congress to implement mandatory born-digital legal deposit in U.S.

Appendix C

Dodging the Memory Hole 2016: Saving Online News

Ideas for specific projects that will advance online preservation practice today

Project Idea: Group 1

IndieWeb Journalism: Using philosophies from the decentralized web and IndieWeb.org, allow journalists (and other content creators) to own their own content on their own domain and be able to easily syndicate it out to larger distribution hubs; still allowing conversation around those pieces of content.

Project Idea: Group 2

An Open Platform for News Article "Peer Review": Crowd-sourcing the curation, quality assurance, and dissemination of news articles

Goal: Enable crowd-sourced, moderated evaluation, commenting, and grading of archived web news articles hosted on a public, open wiki/Reddit platform

Project Idea: Group 3

Every Place Has A Story (mobile app)

Provides an AR experience of the temporal past by location. Archival news content would be geotagged and displayed through an app based on the user's location. Think along the lines of *Pokemon Go*, but for news content tied to the location.

Project Idea: Group 4

Be True to Your School (Newspaper)
A proof of concept

Partner with a single, small, independent news organization − perhaps a college newspaper − to develop a plan to fully archive its born-digital news. The plan would address the full spectrum of issues related to archiving a variety of formats and content, including copyright, licensing, storage, metadata, versioning and varied platforms. At the end, we will use this experience to

develop a case study and set of recommendations for other organizations to follow.

Project Idea: Group 5

Meta²Media

Goals
(1) Generate article and collection level metadata for news archives
(2) Agree upon a structure / metadata standard to connect news archives
(3) Create a hub to map collections
Action - funded pilot project (NEH / IMLS / Google)
(1) Pilot partners tagged article metadata and archive-wide metadata
(2) Convene to establish a metadata standard - track use
(3) Launch a prototype hub to track news archives / collect sample use cases

Project Idea: Group 6

Static HTML Backup Plugin for HTML-Based News CMS

Technical solutions for news websites to output static HTML pages as a backup procedure

Project Idea: Group 7

Project Goal: Formalize and broaden communication between technical communities within library and media organizations

Organize joint conference to get key groups talking and building a formal structure by establishing what each technologist brings to the table. The goal is to bridge the standards between library and media archival practices AND PROVIDE INCENTIVES FOR DOING SO. (Think "data handshakes")

Project Idea: Group 8

Contributors will provide and initially populate a central knowledgebase for those trying to get started with web archiving or advance web archiving efforts. This knowledgebase will consist of a number of case studies highlighting solutions to common problems, including legal issues, technical hurdles, etc.

Project Idea: Group 9

This project develops partnerships between memory institutions and the publishing industry to

develop shared content and business models for preservation and long-term access to news.

Project Idea: Group 10

Current digital preservation technologies are designed to support static content, rather than interactive news content, such as data visualizations, or accumulated app data. This project proposes to matchmake content creators with administrative support to design preservation structures for dynamic content.

Project Idea: Group 11

Saving the Small Fries

Make it cheap and easy for small online news organizations to archive and transfer their news content to a cultural institution. Identify common platforms used and then design archiving technologies to align with the current workflow. Develop model contracts.

Project Idea: Group 12

Archiving news apps at the point of creation

Two options to archive at the point of creation: 1. (robust) use ReproZip to zip entire project, archive this file for emulation. 2. Create a sitemap equivalent for the news app

Project Idea: Group 13

A shared/collaborative news "data" repository that uses open source code that ensures preservation, access and reuse between news orgs & the public. It leverages existing systems, such as asset & data management planning tools that utilize metadata and interoperable standards. Sustained by levels of membership and distributed responsibilities.

Project Idea: Group 14

No Results Found: An awareness campaign targeting high schools and colleges. Students would be shown an assessment of their online lives and how much is vulnerable to the memory hole. Speakers would then make the link between history textbooks and what lives online today and encourage careers to innovate archiving.

Project Idea: Group 15

NewsSavers! Foster community awareness of digital news archiving issues, through multiple local NewsSavers! branded meetups, with the ultimate goal of establishing a commitment by news organizations to digital archiving. Facilitate communication across news organizations,

cultural heritage organizations, data science community leveraging their existing networks.

Appendix D

DTMH 2016 impact evaluation - before and after

		blue = before event	brown = after event	red = change between before and after			

Q1 - MU Libraries, the Reynolds Journalism Institute (RJI) and the Missouri School of Journalism are conducting research through this confidential six-question survey to help us understand the impact of the Dodging the Memory Hole 2016: Saving Online News forum (DtMH 2016).
The information you provide will guide us as we seek to define the effect this event has had on attendees.
You have been selected for this survey because of your status as an attendee at DtMH 2016. Your participation is voluntary. All the information that you will provide will be kept completely anonymous, so that you cannot be identified individually. The survey takes about two minutes to complete and involves only eight questions.
Please respond below to indicate your choice about participating in this survey:

		Before		After		Change	
	Answer	%	Count	%	Count	%	Count
1	No, I am younger than 18 years old.	0.00%	0	0.00%	0	0.00%	0
2	No, I do not agree to participate.	0.00%	0	1.96%	1	1.96%	1
3	Yes, I am at least 18 years old and agree to participate.	100.00%	47	98.04%	50	-1.96%	3
	Total	100%	47	100%	51	0.00%	4

Q2 - To which of the following communities do you currently identify?

	Answer	%	Count	%	Count	%	Count
1	Minority	11.90%	5	10.87%	5	-1.03%	0
2	Underserved	0.00%	0	2.17%	1	2.17%	1
3	Both of the above	7.14%	3	6.52%	3	-0.62%	0
4	None of the above	71.43%	30	71.74%	33	0.31%	3
5	Other (please specify)	9.52%	4	8.70%	4	-0.82%	0
	Total	100%	42	100%	46	0.00%	4

Q2_7_TEXT - Other (please specify)							

	Answer						
1	mixed						
2	Unappreciated and undervalued						
3	I object to the question.						
4	Human						
Q3 - Which of the following communities does your organization specifically serve?							
	Answer	%	Count	%	Count	%	Count
1	Minority	0.00%	0	2.22%	1	2.22%	1
2	Underserved	0.00%	0	0.00%	0	0.00%	0
3	Both of the above	47.62%	20	48.89%	22	1.27%	2
4	None of the above	30.95%	13	31.11%	14	0.16%	1
5	Other (please specify)	21.43%	9	17.78%	8	-3.65%	-1
	Total	100%	42	100%	45	0.00%	3
	Other (please specify)						
1	supports diversity initiatives						
2	Catholic community including underserved, overserved, minorities and majorities						
3	multiple communities						
4	should serve all, sometimes successful, sometimes not						
5	I object to the question.						
6	Humanity						
7	All communities						
8	We serve everyone!						
9	News						
Q4 - What is your occupation?							
	Answer	%	Count	%	Count	%	Count
1	Memory institution professional	28.57%	12	19.57%	9	-9.00%	-3

		%	count	%	count	%	count
2	Librarian at a news organization	4.76%	2	4.35%	2	-0.41%	0
3	Information Technologist	11.90%	5	23.91%	11	12.01%	6
4	Journalist	11.90%	5	10.87%	5	-1.03%	0
5	Publisher / News Executive	0.00%	0	0.00%	0	0.00%	0
6	Journalism Educator	9.52%	4	10.87%	5	1.35%	1
7	Lawyer / Legal Organization	2.38%	1	2.17%	1	-0.21%	0
9	Government Organization	0.00%	0	0.00%	0	0.00%	0
8	Other (please specify)	30.95%	13	28.26%	13	-2.69%	0
	Total	100%	42	100%	46	0.00%	4
	Other (please specify)						
	Answer						
1	Graduate student						
2	Librarian/executive director of library consortium						
3	Graduate Student in Journalism						
4	librarian at a research university						
5	Doctoral Candidate						
6	Engineer.						
7	Librarian at university						
8	Computer Scientist						
9	public librarian in a periodicals department						
10	Marketer						
11	Student						
12	Student Archivist						

Q5 - Rate the following items from much higher to much lower than average:							
	Question	Much higher					
		%	count	%	count	%	count
	My current level of interest in preserving born-digital news that appears online:	52.38%	22	59.52%	25	7.14%	3

	%	count	%	count	%	count
My current level of optimism about the ability of U.S. institutions to preserve born-digital news that appears online for as long as it is needed:	2.38%	1	4.76%	2	2.38%	1
My current confidence that I can promote and support the preservation of born-digital news that appears online:	23.81%	10	21.43%	9	-2.38%	-1
My current understanding of the critical issues involved in preserving born-digital news that is published online:	16.67%	7	35.71%	15	19.04%	8
Moderately higher						
	%	count	%	count	%	count
My current level of interest in preserving born-digital news that appears online:	33.33%	14	26.19%	11	-7.14%	-3
My current level of optimism about the ability of U.S. institutions to preserve born-digital news that appears online for as long as it is needed:	9.52%	4	28.57%	12	19.05%	8
My current confidence that I can promote and support the preservation of born-digital news that appears online:	26.19%	11	45.24%	19	19.05%	8
My current understanding of the critical issues involved in preserving born-digital news that is published online:	33.33%	14	47.62%	20	14.29%	6
Slightly higher						
	%	count	%	count	%	count
My current level of interest in preserving born-digital news that appears online:	11.90%	5	9.52%	4	-2.38%	-1
My current level of optimism about the ability of U.S. institutions to preserve born-digital news that appears online for as long as it is needed:	28.57%	12	40.48%	17	11.91%	5
My current confidence that I can promote and support the preservation of born-digital news	40.48%	17	21.43%	9	-19.05%	-8

		%	count	%	count	%	count
	that appears online:						
	My current understanding of the critical issues involved in preserving born-digital news that is published online:	38.10%	16	14.29%	6	-23.81%	-10
		About the same					
		%	count	%	count	%	count
	My current level of interest in preserving born-digital news that appears online:	2.38%	1	4.76%	2	2.38%	1
	My current level of optimism about the ability of U.S. institutions to preserve born-digital news that appears online for as long as it is needed:	16.67%	7	4.76%	2	-11.91%	-5
	My current confidence that I can promote and support the preservation of born-digital news that appears online:	4.76%	2	7.14%	3	2.38%	1
	My current understanding of the critical issues involved in preserving born-digital news that is published online:	7.14%	3	2.38%	1	-4.76%	-2
		Slightly lower					
		%	count	%	count	%	count
	My current level of interest in preserving born-digital news that appears online:	0.00%	0	0.00%	0	0.00%	0
	My current level of optimism about the ability of U.S. institutions to preserve born-digital news that appears online for as long as it is needed:	19.05%	8	4.76%	2	-14.29%	-6
	My current confidence that I can promote and support the preservation of born-digital news that appears online:	0.00%	0	4.76%	2	4.76%	2
	My current understanding of the critical issues involved in preserving born-digital news that is published online:	4.76%	2	0.00%	0	-4.76%	-2

	Moderately lower					
	%	count	%	count	%	count
My current level of interest in preserving born-digital news that appears online:	0.00%	0	0.00%	0	0.00%	0
My current level of optimism about the ability of U.S. institutions to preserve born-digital news that appears online for as long as it is needed:	11.90%	5	9.52%	4	-2.38%	-1
My current confidence that I can promote and support the preservation of born-digital news that appears online:	2.38%	1	0.00%	0	-2.38%	-1
My current understanding of the critical issues involved in preserving born-digital news that is published online:	0.00%	0	0.00%	0	0.00%	0
	Much lower					
	%	count	%	count	%	count
My current level of interest in preserving born-digital news that appears online:	0.00%	0	0.00%	0	0.00%	0
My current level of optimism about the ability of U.S. institutions to preserve born-digital news that appears online for as long as it is needed:	11.90%	5	7.14%	3	-4.76%	-2
My current confidence that I can promote and support the preservation of born-digital news that appears online:	2.38%	1	0.00%	0	-2.38%	-1
My current understanding of the critical issues involved in preserving born-digital news that is published online:	0.00%	0	0.00%	0	0.00%	0