Communication Design Quarterly Review

Volume 13, Number 2, 2012

This newsletter is intended for SIGDOC members but also *by* SIGDOC members. If you have news, reviews, or questions to contribute to the newsletter, please send them to me, Rob Pierce, at robertp@us.ibm.com. Please note the messages to ACM publication authors at the end of this newsletter.

OUR MEMBERS

Notes from the Chair

Dear ACM SIGDOC Members,

This is my first of what will be five editions of Notes from the Chair from me, as I act as interim Chair until the next election. Many new positive steps have been taken and more are underway as we make progress to driving SIGDOC to greater health and viability.

First, to address the concerns from ACM about a decreasing membership, we have offered former members a discount for a limited time to become members again. The list of former members is large – greater than 1000 people. So, that indicated that we have people who register but do not keep their memberships active from year to year. With our limited membership number at about 200, this email has already generated more than 20 new memberships. This number represents a greater than 10% membership for 2012 already.

I would like to see this offer be made each year for former members in the hopes of better retentions and ongoing membership stabilization and growth.

Concerns about more leadership and more volunteers have been addressed with several people offering their support.
Liza Potts is now acting as interim Vice Chair and Kathy Gossett from Iowa State is our secretary treasurer.

We also have made a new SIGDOC student chapter leader appointment to Sarah Egan Warren, Assistant Director Professional Writing Program at North Carolina State University.

Sarah is the faculty advisor for the NC State University student chapter of ACM SIGDOC. As you may know from Brad and Jen, the NC State chapter is extremely active and we have generated many new members to ACM SIGDOC. Sarah has many years of experience mentoring and advising student groups—including navigating the frustrating rules of getting recognized as an official chapter with ACM. As a student chapter leader, she will be available to share this information with ACM SIGDOC members and interested members as we try to grow our student chapters with the goal of doubling their number in 2013 and empower a new generation of SIGDOC members to join the conversation of "what is design of communication."

Sarah has written an article for this newsletter. See this article from Sarah on starting a chapter in this month's newsletter.

NCSU Student Chapter of ACM SIGDOC - http://ncsu.orgsync.com/org/sigdoc

In addition to the importance of student chapters are regional chapters. Based on the success of EuroSIGDOC which has now hosted workshops for the past three years, we are trying to promote additional new regional chapters. As such, Reiko Hishiyama, with the support of several other members, is in the process of creating an AsiaSIGDOC chapter. The goal is to have this chapter created in 2012 and then the Kyoto conference in 2013 will be the chapters' first regional SIGDOC conference.

We believe that nurturing interest in and creation of SIGDOC chapters to be an important effort. As such, we believe both student chapters and regional chapters can be beneficial to our members and to our SIG as well.

Our European SIGDOC Chapter (http://eurosigdoc.acm.org/index.html) had its third annual workshops on information systems and design of communication (ISDOC 2012 at http://eurosigdoc.acm.org/isdoc2012/) and open source and design of communication (OSDOC at http://eurosigdoc.acm.org/osdoc2012/).

Meanwhile, plans for SIGDOC 2012 in Seattle are looking great! Submitted papers are in review this month and discussions and planning are in process for the program, panels, speakers, and other events during the conference. See http://courses.washington.edu/commprac/sigdoc2012/

For 2013, there will be two SIGDOC conferences. This too is a decision based on requirements for ongoing viability and recognizing the necessity of having a domestic SIGDOC conference in addition to Kyoto. John Stamey at Coastal Carolina University will be chairing the event at his school next year and he is looking for people interested in volunteering to be program chair or co-chair.

Dates for these two conferences are as follows and more information is available in the Conferences section of this newsletter:
- CCU, Sept 17-19, 2013
- Kyoto, Oct 7-9, 2013

For enhancing our web presence, Jen Riehle is now ACM SIGDOC's web-master and has completed her redesigning of the SIG's official website. See http://sigdoc.acm.org/
This new site is significantly more usable and manageable and we look to your ongoing use of it and feedback on it.

Our visibility by providing a field of ACM research and industry members to design of communication papers is validated by these numbers which indicate that our "reach" is far greater than our small membership base:

- Publication years 1975-2011
- Publication count 2,085
- Citation Count 3,307
- Available for download 1,975
- Downloads (6 Weeks) 6,706
- Downloads (12 Months) 46,211
- Downloads (cumulative) 562,034
- Average downloads per article 284.57
- Average citations per article 1.59

So, there's lots of steps already taken toward nurturing our SIG vitality and lots of great events and resources for 2012, 2013, and beyond! I hope to see you in Seattle!

Lastly, in addition to a new web site, new leaders, proposed chapters and new conference plans, we'll be seeing a new and expanded newsletter format in the next edition of this newsletter. The first edition of the new Communication Design Quarterly Review will be available in September (see http://www.sigdoc.org/publications/cdqr.html). Contact either of the co-editors, Michael Albers (albersm@ecu.edu) or Liza Potts (lpotts@msu.edu) for more information.

Note that this June newsletter edition is my last one as managing editor. I first became editor for this newsletter in 2001 and have now put together 39 quarterly issues for you, our wonderful members. I continue to enjoy this community that I am part of and I plan to help continuing to share with, learn from, and grow with you, as a SIGDOC member.

A list of all archived newsletters as pdf files is available by clicking the **Table of Contents** tab on this page: http://dl.acm.org/citation.cfm?id=J1351&CFID=91205737&CFTOKEN=12296648

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Advisory information developer
Watson core technology
IBM Corporation
Littleton, MA
robertp@us.ibm.com (e-mail)

Starting a SIGDOC Student Chapter

Energizing and supporting the next generation of SIGDOC, the second item on the call to action in last month's newsletter, is an issue that is near and dear to my heart. For about twenty years, I have been advising student groups (both undergraduate and graduate) and helping them build sustainable organizations. SIGDOC hopes to grow student chapters in 2013 (currently there are two student chapters—one started at Old Dominion University and one active chapter at NC State University) and empower students to become valuable contributors to SIGDOC.

Starting a student organization can be overwhelming and keeping that organization going can be challenging. Below are six strategies for starting a successful SIGDOC student chapter.

S - Start by committing (or finding someone to commit) to be the Faculty Advisor
I - Identify resources and use them
G - Generate new membership and get official with SIGDOC
D - Decide on realistic and appropriate events and activities based on your audience
O - Offer opportunities to get involved
C - Communicate regularly and effectively

Start by committing (or finding someone to commit) to be the Faculty Advisor

Without a faculty advisor, a student chapter cannot exist. Not only do most schools require a faculty sponsor or advisor for a student group to become a recognized organization on campus, but a faculty advisor supplies that all-important institutional memory needed to sustain a student chapter. Turn-over in academic settings can be even more problematic than in a volunteer organization composed of professionals because students are only available for a finite time—once graduation arrives, student volunteers are simply no longer available. While alumni can be extremely valuable resources (like they are in the NC State University chapter), their ability to fully participate is limited. Faculty advisors provide consistency and continuity between academic years and ensure that the chapter survives those years when volunteers are lacking or when all officers graduate and move into their careers.

So what does a faculty advisor do? It can depend on the chapter and the school, but in general, faculty advisors should

- Be an active and informed member of SIGDOC
- Know the rules and policies of ACM and SIGDOC and ensure that they are followed
- Ensure rules/regulations are followed at the university level (registering student group, following university rules about meetings, programs, advertising, t-shirts, fund-raisers, etc)
- Act as the chapter's cheer leader
- Support officers in completing tasks
- Oversee budget issues
- Oversee election process
- Encourage students to apply for awards
- Assist with annual activity and membership reports
- Recruit new members
- Encourage support from other faculty members, alumni, and local professionals

A good faculty advisor must be excited about working with students and SIGDOC. The chapter needs someone who will be committed for the long term.

Identify resources and use them

Campus and ACM resources are available to help faculty advisors and student leaders—and should be used from the very beginning to avoid frustrations or mistakes. Each campus will have specific student organization rules and regulations. In addition to those rules, each campus will have benefits of being a registered student group. For instance, some schools offer funding for starting student groups or for attending conferences. Contact your student organization office or representative early in the process for the most useful support. In addition, ACM offers many resources:

- Volunteer Resources: http://www.acm.org/sigs/panel?pageIndex=2
- Responsibilities of Chapter Officers: http://www.acm.org/chapters/professionals/toolkit/officers-resp
- ACM student chapters: http://www.acm.org/chapters/students
- Chapter FAQ: http://www.acm.org/chapters/faq
- Student Awards: http://sigdoc.acm.org/awards/

Beyond the resources that explain the rules and regulations necessary to running a student chapter, identifying "human resources" is key for starting a chapter. Identify students who have special skills or qualities (organization, leadership, followership, enthusiasm, presentation skills, design skills…), and recruit them directly. Contact relevant local professional chapters, alumni, professionals, and other faculty who can speak at events or offer other services to the chapter.

Generate new membership and *get official* with SIGDOC

Generating membership and becoming an official chapter with SIGDOC feels a little like a "which came first, the chicken or the egg" situation. To become an official SIGDOC chapter, three students must agree to serve as Chair, Vice Chair, and Secretary/Treasurer. In addition, a list of 10 members must agree to participate (see http://www.acm.org/chapters/sig/sigstart). So, there needs to be an established membership before applying to be a SIGDOC chapter. But, to generate enough interested members, they must know enough about SIGDOC to join. See the challenge here? Another challenge is that officers and the Faculty Advisor must also be ACM members.

NC State University's SIGDOC chapter operated for a year as we transitioned from another organization to SIGDOC before completing the application process with ACM. So, after a year of recruiting, organizing, and offering programs each month, we had already established a healthy membership.

Finding the leaders needed to be an official SIGDOC chapter can be as easy as approaching an outgoing-student and sharing information about SIGDOC. We have found that students are interested in meeting with other students, alumni, and professionals who share an interest in the design of communication. Once a few people join the cause, recruiting more members becomes easier and easier. Blanket calls for participation or mass emails rarely work. However, one-on-one conversations between the faculty advisor and a student are the most productive for recruiting. My own reputation for drawing people into our student chapter is well known. I sometimes warn students that if they talk to me too long that I will find a leadership position for them or some project to work on!

Decide on realistic and appropriate events and activities based on your audience

Student chapters don't tend to work with a one-size-fits all model. Each year can be different because of the makeup of the leaders and the changing interests of the members. During the summer, NC State University's SIGDOC student chapter officers meet to brainstorm ideas, events, programs, and speakers for the year. Some years, our focus has been on educational sessions. Other years, networking with professionals has been the emphasis. Some groups of officers are comfortable with more free-flowing social events that have not worked during other years. Being flexible and open to the organic changes of the group will allow the chapter to grow.

Two destructive responses that can surface when planning events are the "we've always done it that way" and the "we tried that last year and it didn't work" attitudes. Both stem from a good place—we want to learn from what we have done in the past. If we have "always done it" then it may seem to make sense that we should continue to do it. If we "tried that and it didn't work" then it may make sense to avoid repeating the mistake. However, both can cause stagnation and frustration. So, student chapters should work to establish traditions that can adapt and change with the officers and members. For example, we host Orientation for the new students to the MS in Technical Communication program. Each year we adapt our presentation and social meet-and-greet time to the interests of our officers and the needs of our new students.

Surveying members to find out what kind of programs they would attend is one way to increase participation. The more you tailor your activities to their needs, the more likely it is that students will find time in their schedules to be involved with SIGDOC. My students are master's degree students, most with full time jobs and families. Adding one more component to their already busy lives can cause stress. To limit the stress, we try to fit our programs and events into the students' existing schedule (before or after class, or partner with a faculty member to use part or all of a class period).

Our focus is on educational, networking, and social events. Below is a list of some of our most successful programs:

- Orientation for new students (excellent opportunity for recruiting)
- Happy Hours/Networking
- Internship/mentoring events
- Roundtable discussions of current events/topics in communication
- UN-Conference with a local professional chapter
- University-specific information
- Community service: Toys for Tots, book drives, collect money for disaster victims, collect cell phones for military, 5K for cancer research, Stop Hunger Now
- Game nights
- Speakers
- Panel Discussions

Offer opportunities to get involved

Any time a student attends an event, I am always assessing for leadership or volunteer potential. Identifying their talents or willingness to help is the first step in grooming students for future leadership positions. As I confessed before, I am a bit ruthless in my approach to getting volunteers. I tend to talk to a member and tell them I noticed that they have a particular skill and then I explain how we could use it in the student chapter. In addition to this approach, I can usually get a "yes" when I ask members to get involved by completing a (usually small) specific task. For example, I have asked students to

- make announcements in their other classes about upcoming programs
- bring a friend or invite a newly admitted student to a program
- look up costs for printing T-shirts
- brainstorm design ideas for logos
- pick up refreshments for meetings.

These tasks require minimal time commitments and they are one-time events. Once students feel comfortable doing smaller tasks, it is time to swoop in for the kill… oh, I mean the recruiting to leadership roles. Providing "job descriptions" for each of the officer positions helps make the recruiting more transparent. Details about many typical chapter positions can be found at http://www.acm.org/chapters/professionals/toolkit/officers-resp . For a new chapter, only three officers are needed and the job description can be customized for the specific school.

Not everyone will have the time, drive, talent, or commitment to be a leader in the student group—we need members too! Active members are valued and we must try to show them the benefits of joining SIGDOC and participating in events. Being part of an international organization has a number of benefits (see http://sigdoc.acm.org/join/ and http://sigdoc.acm.org/wp-content/uploads/2011/11/sigdocBrochure-press.pdf). We also must emphasize additional benefits that SIGDOC student chapters can offer such as:

- Developing skills that can be listed on a resume (leadership, collaboration, interpersonal communication, time management, presentation experience…)
- Networking with alumni, faculty, and professionals
- Being exposed to new/different ideas
- Complementing classroom learning
- Meeting and interacting with people who care about communication

Communicate regularly and effectively

In an effort to be true to our name—ACM's Special Interest Group on the DESIGN OF COMMUNICATION—we must practice what we preach. This means communicating with our members in a way that reflects positively on ACM SIGDOC and our chapter. Committing to keeping members informed of events and programs in a timely manner helps increase participation. Establishing a typical channel for communication allows members to rely on a specific way to get information about the chapter. That is not to say that we must put all our eggs in one basket—an appropriate mix of emails, advertisements, internet presence and social media is needed.

All messages that are shared with the membership must be clear. If our officers are putting out poorly written announcements, organizing irrelevant programs, creating unusable websites, posting poorly designed advertisements, or writing conflicting or error-filled messages, we risk alienating our current members and losing potential members. If we can't communicate clearly, how can we be a SIG about the design of communication?

Focusing on increasing student participation will grow overall membership numbers in the short term and hopefully encourage those students to remain a part of SIGDOC after graduation. I hope this resource can be helpful for other universities and colleges interested in starting a SIGDOC chapter. Please contact me if you have any questions.

Sarah Egan Warren
Student Relations Officer
Faculty Advisor ACM SIGDOC
Assistant Director Professional Writing Program
NC State University
seegan@ncsu.edu

LOOKING AHEAD

Conferences

Conference proceedings availability from ACM

ACM has a new print on demand program which is available for conference proceedings. The proceedings list for 2010 and 2011 was used as a starting point. (http://librarians.acm.org/order-print-conference-proceedings) The list of available proceedings will grow as the program continues.

ACM SIGDOC 2011 Conference proceedings

You can use this link to download the conference proceedings:
http://sheridanprinting.com/11-sigdocEpro4c2c4rv/SIGDOC_2011.zip

SIGDOC 2012

30th ACM International Conference on Design of Communication
October 3-5, 2012
Seattle, Washington

http://sigdoc2012.org/

Please plan to join us for ACM's 2012 Special Interest Group on Design of Communication (SIGDOC) conference in Seattle, Washington, October 3-5, 2012. The conference will be held at the Red Lion Hotel in the heart of downtown Seattle.
At the conference, you will have opportunities to exchange ideas with other researchers and practitioners from around the world interested in interaction design, usability, and other issues in the design of communication. The conference program will include research sessions, social events, poster sessions, and workshops led by industry leaders in user-centered design.

Contacts:
Conference chair, Mark Zachry, (zachry@u.washington.edu)
Conference program chair, Clay Spinuzzi, (clay.spinuzzi@mail.utexas.edu)

AsiaSIGDOC 2013

1st ACM International Conference on Design of Communication
Date to be announced
Kyoto, Japan
AsiaSIGDOC 2013 - Waseda University, Kyoto, Japan
Oct 7-9, 2013
reiko@waseda.jp

SIGDOC 2013

31st ACM International Conference on Design of Communication
Date to be announced
Costal Carolina University
Conway, North Carolina
SIGDOC 2013 – Coastal Carolina University, Myrtle Beach, South Carolina
Sept 16-18, 2013
jmstamey@coatal.edu

News from Reiko Hishiyama, 2013 conference chair

Plans are underway for a 2013 SIGDOC conference in Kyoto!

Reiko has made a formal application for reserving conference rooms at Waseda University, because reservations are accepted one and half year before the conference.

An exciting sponsorship and first financial assistance has come from the HAYAO NAKAYAMA Foundation for Science & Technology and Culture. This Foundation has decided to subsidize SIGDOC2013 in Kyoto. To help support preparations for the Conference, the Foundation has already pledged 500,000 Japanese yen for this year.

Mr.Hayao Nakayama is a Japanese businessman and former President of Sega Enterprises, Ltd (Japan). See http://en.wikipedia.org/wiki/Hayao_Nakayama

Waseda University will also be providing financial assistance for the conference and workshop. It's one and half years now until the 2013 Conference, therefore, it will be a long time before a conclusion is drawn, and other Japanese Foundations will also provide financial support for us. You can bet that SIGDOC2013' income comes from participation fees and sponsorships including HAYAO NAKAYAMA Foundation.

Additionally, we will be able to have the understanding and cooperation of IPSJ (Information Processing Society of Japan) as IPSJ has an existing partnership with ACM. See, http://www.ipsj.or.jp/english/organization/acm.html
I plan to promote SIGDOC2013 through IPSJ communication channels for Japanese researchers.

Professor Nicolas Spyratos, from the University of Paris and one of the board members of SIGDOC, stayed at the Meme Media Lab of at Hokkaido University in November, 2011. He recommended to make an appointment with Professor Yuzuru Tanaka, a professor at Hokkaido University.

Professor Yuzuru Tanaka, who was an invited keynote speaker of SIGDOC2006 and now director of the Meme Media Laboratory at Hokkaido University in Japan, agreed to jointly manage and operate of SIGDOC Kyoto conference.

Following the 2012 conference to be held in Seattle, please be assured that we are set to hold the conference in Kyoto. Kyoto is the most famous sightseeing spot in Japan and there are many sights to see. The people in Kyoto are also gentle and kind, and you're sure to be satisfied.

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SIGDOC European chapter

A EuroSIGDOC chapter event OSDOC2012 – took place this month. For more information see, http://eurosigdoc.acm.org/osdoc2012/

Some of the photos from the 2012 workshop:
http://eurosigdoc.acm.org/newsletter.html

The following chapter news is from http://europe.acm.org/mn-europe/:

Featured ACM Chapter: EuroSIGDOC
In this issue we feature EuroSIGDOC, a group of researchers and practitioners pursuing the SIGDOC mission in a European context. SIGDOC is ACM's Special Interest Group on the Design of Communication. Like SIGDOC, EuroSIGDOC focuses on the design of communication as it is taught, practiced, researched, and conceptualized in various fields, including technical communication, software engineering, information architecture and usability. On June 11 the chapter is sponsoring the Open Source and Design of Communication (OSDOC2012) workshop and the Information Systems and Design of Communication (ISDOC2012) workshop in Lisbon. At both workshops, researchers and practitioners will have opportunities to exchange information in areas relevant to the design of communication, processes, methods, and technologies for communicating and designing communication artifacts such as printed documents, online text, and hypermedia applications.

Chapter chair Carlos J. Costa, a professor in the computer science department at Instituto Universitário de Lisboa (ISCTE-IUL), first became involved in SIGDOC in 2006. In 2008, he organized a SIGDOC conference in Portugal. Then, with another ISCTE professor Manuela Aparicio and Aristidis Protopsaltis (University of Coventry) he formed the EuroSIGDOC chapter in 2010. EuroSIGDOC promoted several seminars at the university that were free to all. "The OSDOC workshops, which we began in 2010, have the characteristics of an international conference with the main purpose of bringing together researchers, students and practitioners in the open source area to address communication design issues." Invited speakers at the annual event include Aristidis Protopsaltis (2010), Stefano Zacchiroli, project leader of open source operating system Debian (2011), and Brad Mehlenbacher, associate professor of distance learning at North Carolina State University and author of books and articles on online information design and evaluation (2012).

Future plans for EuroSIGDOC are to: create connections with Eastern Europe and Middle East; increase visibility for the chapter with initiatives such as a local open access journal; plan events around the 40th aniverversary of ISCTE-IUL, which happens this year; and continue to hold OSDOC and ISDOC workshops in 2013.

ACM Student Chapters in Europe
ACM Professional Chapters in Europe

XI Brazilian Symposium on Human Factors in in Computer Systems - IHC 2012

November 5 to 9th, 2012
Cuiabá –MT, Brazil
www.ufmt.br/ihc12

The Brazilian Symposium on Human Factors in Computer Systems, IHC, is a conference for exchanging ideas and information about multidisciplinary studies and researches on the interaction between users and computer systems. It is also a meeting a venue for university and industry researchers from Brazil and abroad, as well as for designers, programmers, educators and other people from different communities and traditions.

The first edition of IHC took place in 1998. In 2011, together with CLIHC (Latin American HCI Conference), the conference was held in Porto de Galinhas, PE, and was attended by nearly 200 people. This year, IHC will be held for the first time in the Midwest of Brazil, in the city of Cuiabá, supported and organized by UFMT (Federal University of Mato Grosso). It aims to show the continuous and significant development of researches in this Brazilian region, overspreading HCI studies throughout the country.

THEME

The main theme of the conference, THE NATURE OF/IN INTERACTION, intends to evoke the tendency for more natural and intuitive interactions, the strong presence of social and collective computing, and the natural process of interaction between people and technology, respecting Nature and its resources.

The coordinators invite the various communities in HCI to discuss the role of researchers and HCI professionals in developing interactive technologies that promote naturality, socialization and collaborative efforts for a sustainable future, in harmony with natural resources. The conference is intended to discuss users' needs, expectations, experiences and possibilities for employing different interaction and communication technologies, aiming at full participation in social and civil life

TOPICS OF INTEREST

The topics of interest include, but are not limited to:

- Accessibility
- Task and user analysis
- Applications on health, education, transportation, sports and environment
- Affective computing and emotional aspects in computing
- HCI education
- Ergonomics in HCI
- Studies on new interaction devices
- Legal issues related to computer systems use and design
- Impacts of HCI on society
- Integrating HCI and Software Engineering techniques
- Interaction with posthumous or post-mortem data
- Interaction and citizenship
- Interaction and information spread
- Interaction and entertainment
- Interaction and aging
- Flexible and context-aware interaction
- Human-robot interaction
- Social interaction: virtual communities, online communities
- Voice and Multimodal interfaces
- Adaptive, adaptable, intelligent interfaces
- Natural user interfaces (NUI)
- Interfaces for web applications
- Interfaces for mobile and ubiquitous systems
- Internationalization of computer systems
- Digital literacy
- Maturity in the evaluation of interaction quality
- Methods and tools for HCI projects
- Design methods, formalisms, tools and environments
- Theoretical models in HCI
- User's privacy and security
- End user programming
- Techniques for assessing and design interfaces with users
- Green technology and sustainable design
- Therapeutic uses of interaction
- Visualization and interaction with big amounts of information (Visual Analytics)

SUBMISSIONS

The coordinators invite submissions in the following tracks:

- Full papers
- Short papers
- Industrial papers
- Workshops
- Tutorials
- Posters and Demos
- Evaluation competition

Submissions can be written in English or Portuguese.

Important dates:
Deadline for submitting full papers: June 28th, 2012
Deadline for submitting works in all other categories: July 05th, 2012

Conference website: www.ufmt.br/ihc12
Conference email: ihc2012@easychair.org
Website for submission: http://www.easychair.org/conferences/?conf=ihc2012

Best regards,
Júnia Anacleto and Vânia Neris (IHC 2012 Program Committee Chairs) - UFSCar
Cristiano Maciel and Patrícia Souza (IHC 2012 General Chairs) - UFMT

CFP for Communication Design Quarterly Review

ACM SIGDOC (Special Interest Group Design of Communication) will begin publishing its expanded newsletter in September, 2012 and continue to deliver four issues per year. It seeks to be the premier informational source for industry, management, and academia in the multidisciplinary field of the design and communication of information. Edited by Michael Albers and Liza Potts, it will contain a mix of peer-reviewed articles, columns, experience reports, and brief summaries of interesting research results.

Communication Design Quarterly Review will be archived in the ACM Digital Library.

We invite you to contribute in any of the following areas:

- Peer-reviewed articles. Articles that cross discipline boundaries as they focus on the effective and efficient methods of designing and communicating information; disciplines will include technical communication, information design, information architecture, interaction design, and human-computer interaction.
- Experience reports. Experience reports present project- or workplace-focused summaries of important technologies, techniques, or product processes.
- Interesting research results. Short reports on interesting research or usability results that lack the rigor for a full article. For example, pilot studies, graduate student projects, or corporate usability studies where full details can't be released.

We are also interested in proposals for guest editing special issues. As a guest editor, you would be responsible for providing two peer reviewed articles on a specific topic and, potentially, coordinating with the column editors so their columns can complement the issue's theme.

For more information or submissions, contact Michael Albers (albersm@ecu.edu) or Liza Potts (lpotts@msu.edu).

CALL FOR PROPOSALS: TCQ special issue on Contemporary Research Methodologies in Technical Communication

From Clay Spinuzzi

The SIGDOC community conducts lots of research—I know, because I see it in our conferences and proceedings. And our research has evolved along with changes in DOC work, in technology, and in how organizations work. Social media, smartphones, activity streams, telepresence, and other fundamental changes are requiring us to rethink our research methodologies, methods, and techniques.

If you've been developing new research methods, honing new techniques, or synthesizing new methodologies, consider preparing an entry for an upcoming special issue of Technical Communication Quarterly. TCQ is an academic journal that is focused on technical communication, and in this special issue, Brian McNely, Christa Teston and I are very interested in manuscripts that can describe the newest research trends for technical communication. And I am personally interested in seeing manuscripts from the SIGDOC community!

Proposals are due by February 15th, 2013; scheduled publication date is January 2015. The official call for proposals is at the TCQ site.

Questions? Contact Brian McNely at bjmcnely@bsu.edu

INTERESTING ITEMS

A new SIGDOC website!

Now officially launched and available: http://sigdoc.acm.org/.
Please bookmark this new URL and feel free to provide input to our webmaster, Jen Riehle: jen_riehle@ncsu.edu

ACM Awards announced

The ACM press release announcing the following five awards was issued today, for additional information please see the Featured Item on:
http://www.acm.org/news/featured/awards/acm-technical-awards-2011

2011 Grace Murray Hopper Award:
Luis von Ahn, Carnegie Mellon University
For his research in harnessing the human side of human-computer interaction for computational goals.

2011 Paris Kanellakis Theory and Practice Award:
Hanan Samet, University of Maryland
For fundamental contributions to the development of multidimensional spatial data structures and indexing.

2011 Karl V. Karlstrom Outstanding Educator Award:
Hal Abelson, Massachusetts Institute of Technology
For his contribution to computing education, through his innovative advances in curricula designed for students pursuing different kinds of computing expertise, and for his leadership in the movement for open educational resources.

2011 ACM-AAAI Allen Newell Award:
Stephanie Forrest, University of New Mexico
For fundamental, paradigm-changing contributions to computer science and biological sciences, most notably bringing together models of immune systems, automated diversity, and network epidemiology, with significant impact on real computer and biological systems research and practice.

2011 Software System Award:
Eclipse
Gregory Adams, IBM
John Duimovich, IBM
Erich Gamma, Microsoft
Kevin Haaland, IBM
Julian Jones, IBM
Philippe Mulet, IBM
Steve Northover, Oracle
Dave Thomson, IBM
John Wiegand, IBM

For the Eclipse platform and its visionary design of a universal IDE (integrated Development Environment) which provides developers with an extensible platform for application development tools, fostering an impressive worldwide open source software development community.

Results of the 2012 SGB Election

SGB Chair:

- Erik Altman
  IBM
  Hawthorne, NY 10532
  ealtman@us.ibm.com

SGB Council Representatives:

- Joseph Konstan
  Department of Computer Science and Engineering
  University of Minnesota
  konstan@acm.org

- Brent Hailpern

Director of Computer Science
IBM Research – Almaden
bth@us.ibm.com

SGB Member-at-Large:

- Yannis Ioannidis
  University of Athens
  Department of Informatics & Telecommunications
  yannis@di.uoa.gr

- Elisa Bertino
  Purdue University
  bertino@cs.purdue.edu

- Patrick H. Madden
  SUNY Binghamton
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Looking for a comprehensive history of SIGDOC?

In the 2011 conference proceedings, see Brad Mehlenbacher's paper, "The evolution of communication design: A brief history of the ACM SIGDOC." The paper is available in the ACM Digital Library at, ***http://dl.acm.org/citation.cfm?id=2038476.2038524&coll=DL&dl=GUIDE&CFID=94443631&CFTOKEN=40411904***.

All SIGDOC newsletters are available in the ACM DL
http://dl.acm.org/citation.cfm?id=J1351&CFID=95117062&CFTOKEN=81155912

Resources page for SIGDOC conference chairs

The SIGDOC conferences page (http://www.sigdoc.org/conference/) includes a link to a page that provides information and links to resources for conference chairs: http://www.sigdoc.org/conference/resources.html
Please check it out and provide feedback. We hope that both former chairs, future ones, and any interested member will find this page helpful and let us know what updates, such as links to additional information, are needed.

Innovators and implementors

Relevant to SIGDOC and ACM discussions on theory and practice, innovation and implementation is the following article,
http://www.stumbleupon.com/su/8FOlpj/www.innovationexcellence.com/blog/2012/01/03/thinking-styles-causing-the-innovation-paradox/

ACM SIGDOC: Book List from Brad Mehlenbacher

Here are books written by some names you might recognize and colleagues I have met and had the pleasure of working with over the years through ACM SIGDOC, reminding me that it's a fantastic organization in many respects.

- Michael Alber's (2010) "Usability of complex information"
- Carol M. Barnum's (2010) "Usability testing essentials"
- Brad Mehlenbacher's (2010) "Instruction and technology: Designs for everyday learning" (for the kids!)
- Carolyn R. Miller and Stuart A. Selber's (2010) co-edited "Rhetorics and technologies"
- Donald Norman's (2010) "Living with complexity"
- Ray Siemen's (2008) co-authored "A companion to digital humanities"
- Clay Spinuzzi's (2008) "Network"
- Jason Swart's (2007) "Together with technology"
- J. R. Talburt's (2010) "Entity resolution and information quality," and
- Mark Zachry's (2007) "Communication practices in workplaces and the professions."

Top Learning Tools of 2011

As defined by the Centre for Learning and Performance Technologies
http://www.slideshare.net/janehart/top-100-tools-for-learning-2011

The 5th Annual Survey of Learning Tools, was finalized on 13 November 2011. This year's list was compiled from the Top 10 Tools lists of 531 learning professionals worldwide – from education, training and workplace learning.

Top 30:
1. Twitter - micro-sharing site
2. YouTube - video-sharing tool
3. Google Docs – collaboration suite (incl Google Forms)
4. Skype - instant messaging/VoIP tool
5. WordPress - blogging tool
6. Dropbox - file synching software
7. Prezi - presentation software
8. Moodle - course management system
9. Slideshare - presentation sharing site
10. (Edu)Glogster - interactive poster tool
11. Wikipedia - collaborative encyclopaedia
12. Blogger/Blogspot - blogging tool
13. diigo - social annotation tool
14. Facebook - social network
15. Google Search - search engine
16. Google Reader - RSS reader
17. Evernote - note-taking tool
18. Jing - screen capture tool
19. PowerPoint - presentation software
20. Gmail - web-based email service
21. LinkedIn - prof social network
22. Edmodo - edu social networking site
23. Wikispaces - wiki tool
24. Delicious - social bookmarking tool
25. Voicethread - collaborative slideshows
26. Google+ - social network
27. Animoto - videos from images
28. Camtasia- screencasting tool
29. Audacity - sound editor/recorder
30. TED Talks - inspirational videos

Intercom

In a recent issue (Sept/Oct 2011) of Intercom is a column by Andrea Ames and Alyson Riley on multimedia in information architecture. http://intercom.stc.org/
Intercom is the monthly publication of the Society for Technical Communication.

Technews

http://www.acm.org/technews/

TED sixth sense technology

http://www.youtube.com/watch?v=mUdDhWfpqxg

TED Eli Pariser: Beware online "filter bubbles"

http://www.ted.com/talks/eli_pariser_beware_online_filter_bubbles.html

SIGDOC on Wikipedia

http://en.wikipedia.org/wiki/SIGDOC

SIGDOC Europe Chapter

http://eurosigdoc.acm.org/

WritersUA:
The WritersUA Web site offers original, free articles, surveys, and resource listings:
http://www.writersua.com

WinWriters Information and Events
http://www.winwriters.com/

Content Wrangler
The Content Wrangler Newsletter: http://www.thecontentwrangler.com/
abelsp@netdirect.net

Don Norman's jnd website
http://www.jnd.org/
Essays: http://www.jnd.org/dn.pubs.html
Design as Communication - http://www.jnd.org/dn.mss/design_as_comun.html

ACM Learning resources
ACM Mapping Guides for faculty who are uncertain where to start with IBM technologies. The Association for Computing Machinery (ACM) is internationally recognized as a premier organization for computing professionals. IBM selected the ACM-recommended curricula as the source against which to map IBM technologies and courseware, making it easier for faculty to determine where open source and IBM technologies might fit into their course content. Also included is a course catalog with more than 400 courses, addressing topics and technologies that will help students develop skills around Business Process Management, Enterprise Content Management, Model Driven Development and other smarter planet, industry-desired skill areas.

These no-charge student offerings are available through the IBM Academic Initiative's Student Software Catalog, accessible via IBM Student Portal at http://www.ibm.com/university/students/.

FEATURES

Sound Usability? Usability heuristics and guidelines for user-centered podcasts

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ABSTRACT
In this paper, I explore usability for podcasts. I begin with a definition of podcasting. Next, I discuss usability for podcasts, focusing on eight key areas. From here, I build seven usability heuristics for podcasts. With the usability heuristics, I examine the anatomy of podcast, providing 127 podcast usability guidelines. I conclude with a discussion of future research needs.

Categories and Subject Descriptors
D.3.3 [Information Interfaces and Presentation]: User Interfaces – evaluation/methodology, theory and methods, user-cnetered design.

General Terms
Measurement, Documentation, Performance, Design, Human Factors, Standardization.

Keywords
Podcast, usability, usability heuristics, usability guidelines, sound, MP3, podcasting, podcaster, audio.

1 INTRODUCTION
Podcasting started out in 2004 as grassroots and noncommercial. Many of the earliest podcasters were passionate about their topics and fascinated with what the new technology could do. Now, companies of all sizes (including Fortune 500 companies), civic groups, authors & artists, charities, hobbyists, magazines, radio stations, all sorts of private citizens, geeks, and ninjas have podcasts. As podcasts become increasingly popular with individuals, teams, and businesses, it is important to understand the usability of these media. We need to know what works well and what does not. We need to comprehend how our users use podcasts and how they respond to the various parts. In addition, we need to understand how Quesenbury's five dimensions of usability (effective, efficient, engaging, error tolerant, and easy to learn) apply to podcasts in general and certain components of podcasts [1].

The actual numbers of people listening to podcasts is hard to determine, as at best we can rely on self-reported data or downloads (but a downloaded podcasts is not necessarily a played podcast). Webster, October of 2010, estimated 70 million Americans have watched or listened to a podcast, putting that at 27% of the population [2]. This is similar to the number of Americans who use iPods (28%), other MP3 players (23%), and much more than Hulu users (15%), satellite radio users (12%), and e-Reader users (3%) [2]. Thus, we see many people are using podcasts. Podcast listeners tend to be male (53%), are fairly evenly distributed between the ages of 18 and 54, tend to listen in their cars (67%), tend to use iTunes to subscribe (76%), and from an earlier study tend to be higher educated (21% have an advanced degree, 7% some grad study, 15% a college degree), tend to have higher household incomes, are more likely to create their own online content [2, 3]. They also tend to listen to more podcasts; Gay et al. found their listeners listened to ten podcasts on average [4].

Despite the high numbers of podcast users there is limited research about the usability of podcasts, although there are plenty of podcasts on the topic of usability. On a recent search on iTunes there were 120 podcasts on the topic of usability (my own included), but there are few usability studies on podcasts. Avgerinou, M., Salwach, J. & Tarkowski, D. have a 2007 proceedings article on information design for podcasts, and Wolfram's thesis is on a rhetorical heuristic for podcast usability. [5, 6]. There are no studies listed in the Journal of Usability Studies on podcasts or even audio. There are, however, some studies of podcast audiences, such as the 2007 article "Astronomy Cast: Evaluation of a podcast audience's content needs and listening habits" by Gay et al. [4]. Gay et al. provides interesting information on the demographics of the audience of Astronomy Cast, along with impacts on audience attitudes, content preferences including length, desired web resources and more [4]. Their findings could easily inform a usability study on podcasts and suggest some areas to consider in such a study [4]. For example, they found eleven of their listeners did not listen to the podcast; they instead read the transcript online [4]. This adds another factor to our understanding the usability of podcasts—how do transcripts fit into the usability and use of podcasts?

In this paper, I present the first step in a large survey usability study on podcasting. In this study, I focus on audio podcasts. While podcasts can be video and a variety of other forms (such as PDF), I am focusing on the most commonly accessed form of podcasts (according to Gay et al. only 1.4% of their listeners watch video podcasts) [4]. In this first step, I develop a definition of usability for podcasts. From there, I present seven usability heuristics I developed, based on the definition of usability. I develop these heuristics into usability concerns for the various parts of a podcast, presenting over 125 podcast usability evaluation guidelines. First, I begin with a definition.

2 THE WHAT AND WHO OF PODCASTS

Before determining what is a usable podcast, it is important to note what a podcast is. The word "podcast" as been defined as a portmanteau of "Personal-On-Demand" and "narrowcast." Thus, in the very name of podcast we have an audience and topic focused transmission (narrowcast) that is both personal and available on demand. More specifically, podcasts are digital media files distributed over the internet. They are not just audio & video, as seems to be a common assumption. However, for the purpose of this discussion of usability I am limiting my use of the term "podcast" to denote audio podcasts only—in MP3 or MP4 file formats. These files are available via subscription through RSS feed technology. They can be played on anything else that can play a MP3 files. Podcasts also are both time- and location-shifted—or they are "any time anywhere" media. Users are not limited to a specific time (6 pm Wednesday on NBC) or a particular location (near a radio and listening). Users can listen whenever and wherever works best for them. In short, podcasts are time- and location-shifted narrowcast digital files available through subscription.

Podcasts are also part of complex systems of use. People can listen to podcasts from websites, blogs, podcatcher software like iTunes, and/or on mobile devices like cell phones and MP3 players. People may subscribe to podcasts through feedreaders, podcatcher software on their mobile device or computer; they may go back to the same site frequently to listen; or they may find a podcast series online and just listen to a single episode. A user's ability to navigate the software technology to listen to the podcast may greatly impact the usability of the podcast, so a true understanding of usability will need to take the great variety of access methods and use into play. In addition, podcasts are often designed to be mobile. Many podcasters assume their listeners are listening on the go in some form—while driving their car, while running or working out, while taking a train or bus, while doing yard work, or whatever. Thus, the user's context of use could play heavily into the usability of the podcast and greatly impact how we design and create podcasts.

3 PODCAST USABILITY HEURISTICS

While there are many definitions of usability, they tend to touch on a few general areas. Barnum states "usability is determined by the user's perception of the quality of the product, based on the user's ease of use, ease of leaning and relearning, and product's intuitiveness for the user, and the user's appreciation of the usefulness for the product" [6, p. 6]. Similarly, the ISO definition of usability is "the extent to which a product can be used by specified users to achieve specified goals in a specified context of use with effectiveness, efficiency, and satisfaction" [7]. Quesenbery has presented five dimensions of usability: effective, efficient, engaging, error tolerant, and easy to learn [1]. Both Nielsen and Zhang [8, 9] have presented heuristics for usability. From these definitions and heuristics, I developed eight key usability concepts to consider:

- Effective: Successfully enables users to meet their goals and/or complete the required/desired tasks
- Efficient: Quickly produces desired results without impacting accuracy or wasting time, actions, and/or resources
- Engaging & satisfying: Attracts the attention of the user and creates a pleasant, fulfilling, and enjoyable interaction(s)/use while meeting the expectations, goals/tasks of the user
- Error tolerant: Prevents errors and when errors occur does not unnecessarily penalize users and enables a quick recovery
- Easy to use & learn: Requires minimal effort and difficulty to use at any point, "supports both initial orientation [use] and deepening understanding of its capabilities" [1, p. 88]
- Context sensitive: Works within the user's context (including the environment and circumstances) of use
- Goal and task oriented: Enables the user to meet goals and complete tasks
- Useful: Being of use by serving the needs/desires of the users

I drew upon these eight concepts to develop podcast heuristics. I deemphasized errors compared to what can be found in many sets of heuristics to better fit the functionality of podcasts. Errors are not a common issues in podcasting due to the way podcasts work—technological issue are not often caused by the podcast itself, but perhaps by the technology used to listen and could include slow loading time, low MP3 battery, or MP3 player issues. Merging these eight usability concepts with podcasting, I established seven key podcast usability heuristics (the nickname for each is in brackets), which I next present.

3.1 Informative feedback and error prevention [Feedback]

Users should receive regular and timely feedback to the state of the podcast including the topic of the podcast, episode, where they are within the podcast, what to expect next, and information that allows them to skip or move through the podcast in ways beyond linear time. Users should be able to identify, at least generally, where they are in the podcast. Episode information should be provided up front, so users can quickly realize if they are listening to the correct podcast and not waste time listening to the wrong podcast. Podcasts should prevent users from making any errors and clearly indicate the beginning and ending of each podcast. Also, they should provide structure, transitions, and other presentation best practices to lighten user's cognitive load for the content of the podcast. For example, the podcast may include information on how long each segment will take if users want to skip it or the information users mostly likely will want to skip should be at the end, where they can easily navigate to the next podcast without missing any key information.

3.2 Satisfying & engaging [S&E]

Podcasts should engage and satisfy the users, as appropriate for the content. This does not, for instance, require a "radio voice" and an expensive studio. Strong content, a passionate podcaster or more, appropriate humor, cleanly edited episodes, helpful transitions, decent theme music, and other such things can lead to an engaging and satisfying listener experience. Obviously what counts as satisfying and engaging varies greatly on genre and podcast. Due to the large number of podcasts out there this not only aids usability, but also can help the podcast attract and keep listeners—thus survive.

3.3 Easy, effective, and efficient [EEE]

Podcasts should successfully enable users to meet their goals and/or complete the required/desired tasks and quickly produce desired results without impacting accuracy or wasting time, actions, and/or resources. Time is a consideration—including length of the podcast and length of segments of the podcast. The podcast should require minimal effort from the users, including cognitive load. Often this will be something as simple as listening to the correct podcast when and where they want in the amount of time they have. However, some podcasts may have additional efficiency considerations. One example is a podcast providing business news for the commute home—this podcast should be shorter than the average US commute, which is 25.1 minutes [10, p. 1].

3.4 Considers users and context of use [Users & Use]

A podcast should consider users differences, including experience level with content, accessibility and access issues, user's language level (beginner, expert…). Podcasts should provide different ways to access information based on needs, uses, and user differences—like transcripts for those with hearing issues or the need to search or scan through the information—allowing the users to tailor their experience. They should also consider how the users are accessing the podcast and related content (subscriptions, streaming through the associated website or blog, podcatcher software like iTunes,…). They need to provide an easy ways to access information. Podcasts should match the user's model of a podcast within that genre. In addition, podcasts should keep user's context and use in mind. Podcasts should not require the user to interact with the technology that is playing the podcast if the user is unable to in her context of use. For instance, the user cannot view the graphic being referenced while she is driving, so do not force her to do so to understand the content. Nor could the user easily adjust the podcast—so great changes in volume or other things that require user interaction can be inappropriate and even dangerous.

3.5 Appropriate design & delivery [D&D]

Superfluous content should be removed to minimize distraction and even competition of components. This does not mean the podcast needs to have minimalistic design, but that the podcaster should balance minimalism with aesthetics and with the user's needs for the podcast. For example, a five minute song that ends a podcast can be appropriate for a music or entertainment podcast, but may be inappropriate for a ten minute business podcast. Audio podcasts should have content that is designed for audio delivery—highly visual and overly complex information may be best delivered in other forms. Podcasts should provide access to visual and other content the user may need for the podcast, but not require the user to access this content while listening. This heuristic includes sound levels, bed music, transitions, voices, sound effects, and other such components and their relations to the purpose of the podcast and needs of the users. Content is delivered in the best medium and form. Delivery is clean and appropriate. One example of inappropriate design and delivery could be bed music that is too loud and competes with the content. Another could be the six minutes in the middle of an interview where the people get off topic and ramble—this could be removed, or moved to the end of the podcast for users to skip if they desire or placed outside the podcast (perhaps an extra file interested users could download).

3.6 Consistency [Consistency]

A podcast should be consistent across and within episodes and consistent with the genre and genre conventions. Any breaks from consistency should be explained. Consistency can include publication schedule, length, transcripts, format, organization of podcast, and topic (a podcast on networking should not become a podcast on gardening). For instance, if advice podcasts tends to be 20-30 minutes in length, then a new advice podcast should follow this convention or explain why it does not. Or, if a podcast always is published with the transcript in the show notes, this should continue.

3.7 Documentation and support [Doc]

While a podcast should never need help documentation, other types of documentation and support may be needed. Transcripts and show notes should be available and easy to access—for reference, searching, and users with accessibility issues. Other support content, such as links, references, images, and content referenced in the podcast should also be available and easy to access. All available documentation and support materials should be noted in the podcast and access information should be provided. For example, if a full transcript is available, the podcaster should mention in the podcast where it is available —perhaps on the associated blog and in the lyrics field of the MP3.

3.8 Severity

In addition to heuristics, it is important to understand the severity of the usability concern or issue. Drawing on Nielsen's usability severity rating scale [10] and Zhang's application [9], I incorporated these five severity ratings:

- 0: Not at all a usability problem
- 1: Cosmetic Problem—Lowest priority, fix if time is available after other problems have been fixed. This could be minor editing issues, small differences between the transcript and recording, or minor rambling.
- 2: Minor Usability Problem—Low priority to possibly medium priority. Fix after higher priorities have been fixed. Consider needs and goals if deciding between minor problems. This could include some rambling/time off topic, moderate sound level issues, and problematic or nonexistent transitions between parts.
- 3: Major Usability Problem— High priority. This is causing major usability issues and must be fixed for a usable podcast. This may include technical problems with the podcast including sound issues, sound levels, and other problems like missing parts of the podcast.
- 4: "Usability catastrophe" —Highest priority. This makes the product unusable and must be fixed before the podcast is published. It is rare podcasts will have this level of problem, as the interface is not part of the podcast, and thus podcasts will likely be "usable" outside of the podcast text itself. But, podcasts can have serious sound issues or other things that may lead to a usability catastrophe.

4 The Anatomy of a Podcast

These heuristics are a starting place for designing a usable podcast and evaluating the usability of a podcast. Each huerisitc can be applied in different ways to each part of the podcast. A fully usable podcast should incorporate these not only generally put for each component. So, I developed a checklist over 125 of usability evaluation guidelines to consider, which I based on applying the heuristics to the components of a podcast. The anatomy of a podcast includes 11 main parts:

- **Album Art:** Image, logo, or other visuals included to be shown on the iPod/MP3 player while listening and in other ways associated with the podcast (on related sites and content, as the icon in iTunes…).
- **Album Text:** All text that is part of the actual podcast files. This includes Name (used for episode name), Artist (podcaster), Album Name (Podcast name), Album Track Number (used for episode number), and the Lyrics field (used for show notes or transcript). This text is visible or accessible when one is playing a podcast on most MP3 players.
- **Pre-Intro**: Includes episode number, date, topic, other vital information. This should be very short (approximately five seconds) and the very first part of the episode—like a book title. This tells the listeners what they are listening to before they get too far.
- **Theme Music:** Music that is the "theme" of the podcast. Sometimes a single song is the theme and used in the intro and outro. Sometimes a different song is used for the intro and outro—the intro will them likely be the "theme" song. The music should connect to the podcast is some way and may become a recognizable auditory association to the podcast—a bit like a logo is a visual connection to a company.
- **Intro:** This is longer than the pre-intro and will come after it. The intro includes similar information to the pre-intro but explains more. If the pre-intro is like a book title, the intro is like the blurb for the book on the book jacket or the introduction of a paper. These are often about 30 seconds long, in which the podcaster needs to grab and keep listeners attention (by about 45 seconds from start of podcast). This needs to include an overview of the podcast—what the podcaster will be talking about/doing in the episode. Often this will include information on the podcaster.
- **Musical and Other Transitions**: Often podcasts will have music and/or other transitions between sections of the podcast. These can match theme music or be something different. Bells, whistles, animal noises and more have been used.
- **Bed Music**: Background music that is played for all or parts of the podcast. It is important that the podcaster is heard over the music. Often these are faded in and out. These are most common in intros and outros.
- **Main Body:** This is the "meat" of the podcast. Could be interviews, a researched argument, a story, a rant, ten great songs, whatever.
- **Visuals**: Enhanced podcasts can include visuals that play with the audio comment and can have chapter markings. Enhanced podcast are difficult to do (easier with Macs) and do not play on all MP3 players.
- **Outro**: The podcast wrap up and conclusion. Often these include a summary, teasers for the next episode, information on where users can find the links and resources discussed in the episode, contact information, a catch phrase, citations, necessary credits (such as giving credit for CC music used), and a fade out to music or something else.
- **Podcast as a Whole:** This is the whole podcast file, but not the associated additional text. So, this includes all parts of the audio file, including everything listed above.
- **Additional Texts:** These are anything besides the podcast file associated with the podcast. These can include the blog of the podcast, documents associated with the podcast, links to websites, and PDF transcripts. Most podcasts have an associated blog.

5 Podcast Usability Evaluation Guidelines

Applying the seven podcast usability heuristics to the 11 parts of a podcast, I developed more than 125 Podcast Usability Evaluation Guidelines (see the Tables 1–12 for each guideline). I assessed the severity of each guideline and provided a range for the severity for each guideline, based on the importance of the guideline to the overall use and usability of a podcast. These guidelines can be used by new podcasters who are trying to create a usable podcast, by seasoned podcasters who want to improve their podcast, and by usability researchers and analysts to determine the usability of a podcast. These guidelines can also be considered for other digital texts, especially sound-based texts.

Table 1. Album Art Guidelines

Usability Concerns	Heuristic	Severity
Provides a simple, clean, clear, and straightforward design with podcast name and logo.	Feedback EEE, Users & Use, D&D	1–3
Easily identifiable in smaller sizes (MP3 player screens, podcast thumbnails…) from a few inches to about two feet (for instance, on a MP3 player held at arm's length).	Feedback	3–4
Enables quick identification of the podcast by the album art when the episode comes up.	Feedback	3–4
Provides enough information on topic to engage.	S&E	0–2
Stimulates user interest.	S&E	0–2
Displayed consistently across all episodes.	Consistency	2–3

Table 2. Album Text Guidelines

Usability Concerns	Heuristic	Severity
Is complete and provides user with all the information needed to identify the podcast series and episode (both name and number).	Feedback, EEE, Users & Use, D&D	3–4
Includes a transcript or show notes that allows the user to navigate the episode, including time/place location of information should the user want to skip segments or access a particular segment.	Feedback, EEE, Users & Use	1–2
Stimulates user interest. Episode title, podcast title and more should be interesting.	S&E	0–3
Provides enough information on topic to engage.	S&E	0–2
Provides necessary information for users' context.	Users & Use	2–3
Provides information, especially podcast name, episode number and name, consistently across all episodes.	Consistency	3
Includes show notes or transcript.	Doc	1–2

Table 3. Pre–Intro Guidelines

Usability Concerns	Heuristic	Severity
Exists. These are common, but not all podcasts have them.	Feedback	3–4
Includes episode name, topic if not obvious from the name or the name is too close to another episode's name, and podcast name.	Feedback, EEE, Users & Use	3–4
Stimulates user interest. Episode title, podcast title and more should be interesting and presented in an engaging way (interested, non–monotone voice, for instance).	S&E	0–3
Is short and to the point—ideally less than 10 seconds.	EEE, Users & Use	1–3
Delivers necessary information (podcast title, episode name, possibly episode number) and nothing more.	D&D	2–3
Provides podcast name, episode number and name consistently across all episodes.	Consistency	3

Table 4. Theme Music Guidelines

Usability Concerns	Heuristic	Severity
Provides backup support for the identity of the podcast. Not required, the identity can be handled in other ways, but severity increases if other identifiers are not used.	Feedback	1–3
Corresponds to podcast subject area to increase engagement—professional music for a professional podcast, fun music for a kids podcast, futuristic music for a podcast about future technology—as appropriate for the podcast.	S&E	0–3
Sets the mood/tone of the podcast.	S&E, D&D	0–2
Is generally likeable and interesting. Does not turn users off of the podcast.	S&E	1–3
Is of an effective length—not too long (especially) nor too short.	EEE, D&D	1–3
Considers users' context and needs in the selection of music, length of music played, and style of music.	Users & Use	1–2
Is the same across all episodes.	Consistency	2–3

Table 5. Intro Guidelines

Usability Concerns	Heuristic	Severity
Includes episode overview/ outlines; more details required for longer episodes.	Feedback	3–4

Provides users information on segments they may find more or less useful and may want to skip, including areas too advanced or easy. Ideally give at least a time in the episode, so used can navigate these sections.	Feedback, Users & Use	1–3
Orientates the user to her location within the series—for example part two of three. Provides information on the rest of the series. *[only necessary for series*]	Feedback	2–4
Displays podcaster's interest or passion in the topic to engage listener.	S&E	1–3
Provides enough of a podcast overview to hook the listeners and make them want to stay without going too long.	S&E	1–3
Starts in a timely manner (normally within 30 seconds of the start of the podcast).	EEE	1–3
Provides key information in a short amount of time.	EEE	1–3
Covers topics and episodes title (at least) within 45 seconds of the start of the podcast.	EEE	
Points out ways to access alternative content to allow for users to tailor of content.	Users & Use	1–2
Considers context and method of use—providing information in ways that best work with the medium.	Users & Use	1–3
Provides key content in appropriate tone.	D&D	1–3
Precludes superfluous material.	D&D	1–3
Matches the introduction of the other episodes.	Consistency	2–3
Corresponds to the introduction format of other podcasts in the genre.	Consistency	2–3
Points to any additional documentation or support materials.	Doc	1–3

Table 6. Musical & Other Transitions Guidelines

Usability Concerns	Heuristic	Severity
Provides consistent transitions—if music is used it is used consistently and predictably. The longer the podcast the more severe the lack of transitions is—also the more segments the more severe the lack of transitions.	Feedback	1–3
Indicates location in the podcast—including where was and where going (for example "That wraps up the topic for today. Now we move to listener feedback"). For longer podcasts these verbal transitions are more necessary.	Feedback	1–3
Adds interest and possibly fun or entertainment between segments.	S&E	0–2
Keeps users hooked by not straying from the topic too far and corresponding to the topic.	S&E	0–3
Provides mental breaks between segments or in longer segments to keep and holder overall listener's interest and reduce mental load, without wasting time.	S&E, EEE	1–3
Are short and informative: Keeps time in mind and does not waste user's time.	EEE	1–3
Provides information on the next segment, so users can skip if the segment is not appropriate for their levels or needs.	Users & Use	1–3
Considers users' context and needs in the selection of music, length of music played, and style of music.	Users & Use	1–2
Considers users' context and needs in the types of transitions used, frequency of transitions, and even the inclusion of transitions.	Users & Use	1–2
Adds aesthetics and sets tone.	D&D	1–3
Does not get superfluous.	D&D	1–3
Used consistently within the episode.	Consistency	1–2
Used consistently across all episodes	Consistency	1–2

Table 7. Bed Music Guidelines

Usability Concerns	Heuristic	Severity
Used consistently to aid listeners with their location in the podcast—for example only used in the intro and outro, or used with a fade out at the beginning of each section.	Feedback	0–2

Adds and keeps interest during the start or end of segments.	S&E	0–2
Provides or supports the tone of the podcast—such as scary music during a horror story.	S&E, D&D	0–2
Does not overpower the content being presented at the same time—user should be able to easily hear the podcaster/content over the bed music.	EEE	3–4
Does not distract from content.	EEE	3–4
Considers users with hearing problems that may not be able to differentiate between background noise and key content.	Users & Use	3–4
Considers users' context and needs in the choice to use music, selection of music, length of music played, and style of music.	Users & Use	1–2
Adds aesthetics and sets tone.	D&D	1–3
Used consistently within the episode.	Consistency	1–2
Used consistently across all episodes.	Consistency	1–2

Table 8. Main Body Guidelines

Usability Concerns	Heuristic	Severity
Follows a consistent pattern from episode to episode.	Feedback	1–3
Provides location information every few minutes through transitions, overviews, summaries, and placement indicators like "next" and "second."	Feedback	2–4
Employs an interesting and engaging voice and tone—but "radio voice" not needed. Podcaster(s) should make sure they seem interested and even passionate about the material and that will add to the listener's engagement and satisfaction.	S&E	1–3
Provides the listeners with the materials they need or want.	S&E	1–4
Keeps on topic and to the point (as necessary, some podcasts may be engaging by going off topic), avoiding distractions and superfluous material.	S&E, D&D	0–2
Delivers key and expected information/content.	EEE, S&E	1–4
Supplies content effectively—without unnecessary tangents, ramblings, excessive details, and so on. Listener's time is kept in mind.	EEE, S&E	1–4
Presented at the level of the majority of the audience.	Users & Use	2–4
Accommodates other key user groups/levels by offering additional content—such as definitions for beginners and short theoretical sections for experts.	Users & Use	1–3
Delivers content appropriate to the user's context and methods of use—for example, highly complex information may not be best is a podcast meant to be listened to while driving.	Users & Use	1–4
Matches the body of the other episodes.	Consistency	2–3
Corresponds to the body format of other podcasts in the genre.	Consistency	2–3
Points to links and further information on any sources, documentation, or additional materials.	Doc	1–3

Table 9. Visuals Guidelines

Usability Concerns	Heuristic	Severity
Used as necessary to provide additional location information.	Feedback	0–2
Adds interest and supports the podcast episode.	S&W	0–2
Supports tasks were users can access/view visuals, such as workout positions during a workout.	EEE	1–3
Illustrates complex concepts with visuals to support user needs and levels.	Users & Use	1–3

Provides visuals only in contexts and types of use where the visuals can be accessed—a podcast for commuters should not require the driver to look at visuals, for instance.	Users & Use, EEE	1–3
Supports content and aids in delivery.	D&D, Doc	1–3
Used consistently within episode and across episodes.	Consistency	1–2

Table 10. Outro Guidelines

Usability Concerns	Heuristic	Severity
Includes episode summary and wrap–up—more details required for longer episodes.	Feedback	4
Leads into the next episode to indicate place in the series or episodes.	Feedback	2–3
Orientates the user to her location within the series—for example part two of three. Provides information on the rest of the series. *[only necessary for series]*	Feedback	0–2
Reminds user of the satisfying content by summarizing and highlighting key points.	S&E	0–2
Hooks user on next the next episode.	S&E	0–2
Engages with same passionate/interested tone.	S&E	1–3
Wraps up episode effectively and efficiently.	EEE	1–3
Points out ways to access alternative content to allow for future user tailoring of content.	Users & Use, D&D, Doc	1–3
Fits context and use.	Users & Use, D&D	1–2
Matches the outro of the other episodes.	Consistency	2–3
Corresponds to the outro format of other podcasts in the genre.	Consistency	2–3
Provides basic reference information.	Doc	1–2
Points to links, show notes, transcripts, and further information on any sources, documentation, or additional materials.	Doc	1–3

Table 11. Additional Texts Guidelines

Usability Concerns	Heuristic	Severity
Provides information needed on related podcast, such as episode number and section it is related to.	Feedback	2–4
Follows location/place practices (in text feedback) as normal for type of text.	Feedback	2–4
Provides users methods to further explore the topic and content.	S&E	0–4
Follows the rules for efficiency and effectiveness for the type of text.	EEE	1–3
Are easy to access.	EEE	1–3
Matches appropriate user levels and needs.	Users & Use	1–3
Provides information needed to support different user levels.	Users & Use	1–3
Accommodates the different access methods of users (text transcripts for the hearing impaired, for example).	Users & Use	3–4
Delivers materials in forms that best match use, content, purpose and context.	Users & Use, D&D	1–2
Used consistently within episode and across episodes.	Consistency	1–2
Designed to support the core content.	D&D, Doc	1–2
Easily accessible from information provided in the podcast.	Doc	1–3
Are available for users to access, search, and utilize: at least show notes or a transcript outside the podcast file—on an associated blog for instance.	Doc	2–3

Table 12. Podcast as a Whole Guidelines

Usability Concerns	Heuristic	Severity
Utilizes various techniques throughout in a consistent manner to provide feedback on user's location within the text for navigation and location.	Feedback	2–4
Weaves content, podcaster tone/engagement, music, and other pieces of the podcast together into a satisfying and engaging text.	S&E	2–4
Provides an edited, clean podcast without distracting sound issues, noises, or repetitions.	EEE, D&D	1–4

Fits within time constraints (such as an expected episode length, or commute time for podcast designed for commutes or a workout time for podcasts designed for workouts).	EEE	3–4
Provides link and methods to easily access additional material.	EEE	1–2
Offers a variety of ways to access key content—through the podcast, through transcriptions and show notes in the album text and corresponding site, links to references, and so on.	Users & Use	3–4
Provides additional content for users of different levels—such as definitions (perhaps in the transcript) for beginner users, and links to advanced applications for expert users.	Users & Use	1–2
Considers context and use, presenting only appropriate materials for the context and methods of use.	Users & Use	1–4
Delivered in correct format—heavily visual material for instance, should not be a podcast.	D&D	3–4
Is of an effective length—not too long (especially) nor too short.	D&D	1–3
Sound levels are appropriate across the podcast and with other MP3 files.	D&D	2–4
Considers the sound as a medium and presents material in best ways for this medium.	D&D	1–3
Balances aesthetics and minimalism.	D&D	1–3
Parallels in format, content type, arrangement, and delivery other episodes and within the genre.	Consistency	2–4
Applies consistent sound levels and sound editing.	Consistency	1–3
Provides reference information for listeners to locate and access the music, citations, references, and other outside material used in the podcast.	Doc	1–2
Provides at least enough support materials for those with hearing issues to access the text and for those who need an alternative form of access. Ideally provides a form of the text that can be quickly skimmed and searched (via search engines and keyword site and browser searches).	Doc	1–2

6 Conclusion: Usable passion

With 70 million or more podcast users in the United States, it is past time we understand the usability of this medium. This project is one step in that direction. Further research must be done applying these heuristics and guidelines to actual podcasts, usability testing podcasts, and conducting other usability studies of podcasts. The seven podcast usability heuristics and 127 Podcast Usability Guidelines offer researchers, analysts, designers, and podcasters a way to understand how usability applies to podcasts. Currently, many podcasters podcast for the love of it. They dedicate time, resources, and money to podcasting, often with no expectations of money or rewards. With these heuristics and guidelines, these podcasters can begin to make their podcasts more usable and thus likely more successful. With these guidelines, podcasters can make their passion usable.

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Some Impacts of "Big Data" on Usability Practice

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ABSTRACT

Two shifts in the technological landscape – the era of "big data" and the popularity of Agile software development methodologies – have made users (and specifically data about them) central to the development process and broadened the definition of user-centered design and usability testing. This paper briefly describes the impact of these shifts on the usability practice. Rudimentary data types useful to usability practitioners are introduced, as well as helpful data tools and required skills. The paper concludes with a list of methodological and pedagogical gaps that should be addressed.

KEYWORDS

SIGDOC, ACM proceedings

1 INTRODUCTION

Two recent shifts in the technological landscape – the arrival of the era of "big data" and the popularity of Agile software development methodologies – have made users (or rather, quantitative data that describes user behavior) central to software development and broadened the definition of user-centered design and usability testing.

This paper begins with an overview of these two shifts and briefly describes their impact on usability practices. Next, it introduces tools and suggests skills helpful to usability practitioners who are new to the idea of integrating user data in their work. The paper concludes with some benefits and drawbacks of the user data deluge.

This paper is intended for technical communicators and usability and design practitioners who would like to learn more about how to incorporate user data into their work, some common types of data they can expect to encounter along the way, and tools that make this work easier. Much of this content will be familiar to practicing data scientists.

2 A CHANGING USABILITY LANDSCAPE

This section describes what "big data" [4], including the rise of mobile device usage and Internet access, and the popularity of Agile software development methodologies. It also introduces some of the implications of these shifts for usability practitioners.

2.1 The Rise of "Big Data"

The professional and popular press has declared that we have entered the era of big data," a catchphrase that communicates the fact that more data is being produced than ever before; that hardware can store more data than ever before, tions and algorithms can better analyze more data than ever before. In short, the necessary technological conditions to produce, store, analyze and learn from vast quantities of data have been met.

Though di□cult to quantify, it is estimated that 1,200 exabytes of digital data were created in 2011 alone. (Helpfully, the Economist points out that one exabyte is equivalent to 10 billion copies of the Economist.)[4] We have more data, in part, because more things create data: sensors, computers, research labs, cameras, phones and so on surpassed storage capacity in 2007 [4].

Why should usability practitioners care about this data deluge? Because much of this data is user data, and that has made users more central to product development in the form of detailed data about their behavior. Taken in the aggregate, user data enables researchers to understand human behavior of many kinds (whether book buying, film watching, or dating) at the popu- lation level rather than the individual or small study sample level. Entire systems are designed on and driven by user behavior: we are all familiar, for example, with Amazon and Netflix using collaborative filtering to make recommendations to users based on what other users like[4] .

Quantitative user data like this may (and may not) be what usability practitioners have in mind when they discuss users being more central to development processes and their feedback being incorporated at numerous stages[5]. There are differences in what quantitative user data and observational human studies can tell researchers. To generalize a bit, user data tends to provide more "what" than "why": often, data makes it clear that something has happened but cannot identify causes and suggest solutions. Instead, data is analyzed, observations made, multiple solutions tested, and data observed to see which solutions have had a measurable e□ect.

In addition to learning from product usage data, improving the usability of data itself, within the organizations it drives, is a challenge that usability practitioners and technical communicators are particularly well positioned to address.

2.1.1 Mobile Devices and Data

As of July 2011, an estimated 42% of Americans own a smartphone[?], each one with its own data-creating sensors, cameras, web access, apps, and more. In January 2012, AdAge reported Google data that indicated more people worldwide have desktop or laptop computer [2]. In the U.S. the di□erence is nearly 10% more (76% to 68%), although consumers still report accessing the internet on multiple types of devices [2].

Usability practitioners began testing and recommending best practices for mobile devices several years ago, creating a substantial body of research on mobile usability that needn't be belabored here. It is important that now abundant data provided by mobile devices and apps, however, supplement these practices: a single product can be available on several hundred mobile devices globally, and one person may access the same product from a combination of di□erent devices (a smartphone, tablet, and browser on a laptop, for example, as is the case with many users of Catch Notes).

2.2 From Waterfall to Agile

Most technical communicators and usability practitioners are familiar with software design, development and testing methodologies. Though it is now commonplace for "big sites run controlled experiments to see what works best"[4], this is a recent development powered, in part, by the big data shifts described earlier.

Briefly, the five major phases of Waterfall development proceed linearly and are comprised of Requirements, Design, Implementation, Verification and Testing. The creation of documentation, especially requirements and design documents, is also a significant aspect of Waterfall methodologies[7]. Product design is completed upfront and that design is tested with users later when complete, or nearly. Such extensive phases proved both costly and ine□ective[7]. It is di□cult, for example, for people to know exactly what requirements they need before reviewing a working prototype and commenting on it, and their requirements change over time. So much design being done early on, and subsequently changed, invalidates a good deal of working hours and increases development costs[7].

For these reasons and others, Waterfall methodologies have lost ground to Agile method- ologies during the past decade. While Waterfall assumes that both the problem and solution are known at the beginning of product development, Agile practices acknowledge that while a problem may be known, the best solution(s) to it are unknown. The expectation is that testing and iterative development, with the inclusion of user solution(s) to a problem. For this reason, Agile development principles include the early and frequent delivery of working software (often referred to as minimum viable products or MVPs), from a couple of weeks to a couple of months at most, to real users [1]. User acceptance is too costly to risk finding out about it at the end, and it can't come at "the end" if there isn't one anymore. Through these ongoing cycles, hypotheses about the market, feature success, pricing and more are tested all the time.

These ongoing cycles alter the view of usability as an end-of-the-production cycle a□air for the better. Johnson et al. noted that "Practitioners and scholars alike have been continually frustrated by the fact that, at least in the worlds of engineering and commerce, usability is often seen as an end-of-the-production-cycle a□air. That is, we claim that we know better; we are well aware of the strong impact that early, middle, and late usability can have on product usefulness, marketability, and integrity."[5] Agile methodologies embody these beliefs, albeit in the form of user data more than observational studies of human participants.

2.3 Data Itself

What do we mean when we talk about user data? Using concrete examples from Catch, the following section introduces common types of data, where they are usually stored, and describes why they are useful to usability practitioners and product designers. It covers the most critical steps of logging, storing, analyzing and visualizing data.

2.3.1 Hunting, Gathering and Cleaning Data

The first, unavoidable step in making use of data is finding it: finding out which data is being collected, where it is stored, what its contents are, what those contents mean, and determining if they have value. Though it sounds simple, the process of finding and documenting data is time consuming, not always pleasant, and surprisingly manual: often, the best way to find data is to ask people in person, and it is not always easy to find the people who truly understand the contents of various databases.

Usability practitioners' familiarity with interview techniques helps to facilitate easier data and documenting data contents are two other areas in which technical communicators are skilled and can reduce organizational data pain. User researchers already familiar with cleaning data (understanding and naming fields in data sets; removing extraneous characters or cases with too many empty or null fields; and so on) will find their work cut out for them and their skills valuable. Fortunately, free tools such as Google Refine have helped to make repetitive data cleaning tasks significantly easier and faster.

2.3.2 Log Files and the User-Agent String

This section describes some of the most common forms that data takes and where might a practitioner begin to look for it, using rudimentary examples of log and system files in which valuable usability and interaction data can be found.

Log files are records of system processes, common but important. Generally, "log file" is taken to mean "server web log file." Anything from the Internet that hits a server might be logged and most web-based products, whether mobile app or browser-based, hit a web server at some point. A log file's utility may not be obvious from this description, but some of the questions that log files can help answer are obvious to usability practitioners: How do users use the product?

At Catch, for example, millions of people use one of our mobile apps, Catch Notes, on more than 300 di□erent mobile devices. This device variety has usability implications, since each device has di□erent capabilities, interaction modalities (side-to-side swiping vs. tapping), and screen sizes, making a display that looks great on a larger device screen appear crowded on a smaller screen. Operating system (iOS and Android, for example) di□erences also exist, as do di□erences between versions of those operating systems. Android 2.1 and Android Ice Cream Sandwich are di□erent from one another. Each provides the Catch Notes Android app with di□erent automatic capabilities and even makes our app look di□erent in unexpected ways, such as background shading. It is important for usability and design practitioners to know how these factors and others can change a product's appearance and functionality, and how it helps detect and fix potential usability problems.

Fortunately, the rudimentary user-agent string relates what devices and platforms a product is self. As with most data, the user-agent string is not especially helpful on an individual user basis but is most helpful in the aggregate, across many users.

The below is a user-agent string from a mobile device:

```
Mozilla/5.0 (Linux; U; Android
2.1-update1; de-de; HTC
Desire 1.19.161.5 Build/ERE27)
AppleWebKit/530.17 (KHTML,
like Gecko) Version/4.0 Mobile
Safari/530.17
```

This string provides a great deal of information. It tells us that the user has an HTC Desire smartphone (a touchscreen, 3G phone), which is running the Android 2.1 operating system and version. It is HSPA/WCDMA (2m up (HSUPA), 7.2 Mbps down) or GSM/GPRS/EDGE (quad band), and contains features like a 5 mpx camera, bluetooth 2.0, USB, Wi-Fi (802.1b/g), GPS. We also know that it can handle audio files in the formats of Audio MP3, AAC, M4A, WMA, MIDI, WAV, WMA, OGG. Since our product, Catch Notes, enables users to create voice notes, it is helpful for us to know what audio file formats are supported on the device, especially in relation to the audio file types web browsers do and do not support. This user may back up her notes to the Catch website, for example, and encounter a usability problem when trying to play back a voice note in an audio format supported by the smartphone but not supported by the browser.

Simple log data also contains helpful information about geography. Log files indicated that Korean users of Catch Notes, for example, had trouble creating accounts. Our server logs registration starts, errors, and completed registrations, and we noticed a high numbers of starts and errors, and low numbers for completed registrations, when we examined registration data by country.

This is an example of a "what" so we could figure out "why." We subsequently found three problems:

1. We remembered that our username and password fields were ascii-only. Ascii encodes characters to represent text to computers and is based on the English alphabet. The ascii-only requirement meant that Korean users could not create usernames and passwords with Korean characters.
2. translated into Korean, nor was there an instruction to use ascii characters.
3. Error messages had not been translated into Korean.

In this way, log files with geography data helped us to find and make a few simple, quick, and inexpensive usability improvements with one of our largest user groups.

2.3.3 Database Records and Privacy

Like server log files, database records contain a great deal of useful information. Database contents depend on what is being collected and databases are usually where the bulk of an organization's data reside, so the data hunting step must apply to databases, too. Documentation should include database technologies in use (MySQL vs. Mongo, for instance), data models, and contents.

Am important question for the usability practitioner is "What data can and should be examined?" Catch Notes, for example, is a note taking product. Users create personal notes which they can share with others at their discretion. These notes are saved to our database primarily for customer back-up, so that they can be made available in case a smartphone is lost or stolen. We would never, ever look at private note data. Though such data may tell us more about the ways in which people use our product, note data is inherently private data and looking at it would violate our privacy policies and ethics. Note data, then, is a "can" but is not a "should."

The Catch Notes database also contains tags (labels that look like #hashtag), which users can add to their notes for organization purposes. Counting tags in the aggregate without any identifying user data helps us understand the ways in which people use (and by extension, do not use) our product without violating privacy policies.

Knowing how many users create tags would be useful if we wanted to limit the number of user interface elements on small-screen mobile devices. We would have to make tough choices about what stays and what goes, and a tags count would help answer questions like "Can we remove the tags or move it to a sub-screen without many people noticing, or not?"

Knowing what words users choose when they create tags is also helpful in the aggregate. It helps us develop informed use cases and personas, high number of tags like #recipes or #meds may also inform, for example, new features we might develop for particular types of notes (checklists and reminders). Finally, tags show the languages in which they were created, which provides a hint as to how use cases might di□er culturally. This simple data ultimately gives us a glimpse as to how users conceive of what they are doing and creating, useful for keeping our biases in check and informed by facts.

Only very simple tools are needed to conduct a frequency count of textual data like tags. R is a powerful statistics analysis tool that makes frequency counts a one-line command. Google Refine is another that makes aggregation and frequency counts very easy, is web-based, and does not require command-line knowhow. Both are free.

Aggregate tag data gave us a macro, quan- titative view of something we later observed at the micro level in a small (eight-person) qualitative study. We observed some of the same tags (#recipes) in our small sample but learned much more about how users attempted and wanted to organize those notes, as compared to how they were actually able to organize their notes. We learned, for example, that tags didn't scale well: some people wanted, and some types of note content demanded, more hierarchical organization, and for tags to be a subcategorization or a labeling system beneath a hierarchy. In addition, many users had no idea what tags were, one reason why just 17% of all notes had tags at the time.

In summary, user data can help practitioners find, investigate, and correct usability problems without a study with users, and can also help inform the design of studies with users, ensuring certain issues are included in the study.

2.4 Data Tools

The types of data discussed so far are not new, but free tools with which to quickly store and analyze this data are fairly new. We've seen that di□erent types of data may live in di□erent places but that, together, they can tell powerful stories about user behaviors and product usability. Visualization tools are key to drawing the stories data tells, as seeing data is the best way to get an idea of what's in it.

Catch uses three tools to combine, learn from, and visualize the basic data described to this they are:

- Open source and free
- Well documented
- Easy to learn
- Automated, pulling data in and pushing displays out (There is no need for manual design tools to make data appear in a certain way each time data must be displayed.)
- Easy to change as data needs and questions about users evolve

2.4.1 Redis

Catch uses Redis (http://redis.io) primarily as a data aggregation tool. Redis listens for "data events" (server logs being made, for example, or data being added to our database) that we've told Redis are important and pulls them in. Though we log everything on our servers and save those logs to disk, we also dump them to Redis. While Redis has many capabilities, we use it primarily for pubsub (publication and subscription). Our server logs are defined as the event "log:servername," so Redis listens for "log:*" which translates to "Pay attention to these events and ingest all server logs that are made." This is how all of our server logs get into Redis.

Let's return for a moment to one of the user-agent string example noted earlier in this paper:

```
Mozilla/5.0 (Linux; U; Android
2.1-update1; de-de; HTC
Desire 1.19.161.5 Build/ERE27)
AppleWebKit/530.17 (KHTML,
like Gecko) Version/4.0 Mobile
Safari/530.17
```

It is the pubsub piece of Redis that extracts properties from the user-agent string and publishes them to Redis. Distinct pieces of the user-agent string then become pieces of a larger measure that we'll call "Measurement" for the purposes of this example. "Measurement" looks like this:

```
{
  "Measurement": { "Os":
    "android", "OsVer-
    sion": "2.1", "Mod-
    el": "HTC Desire",
```

```
entVersion": "4.5.2",
"Country": "gb", "Lan-
guage": "en", "Mobile":
true,
"Time": "2012-01-12T20:23:40Z",
}
```

In practice, "Measurement" is not confined to the contents of server logs or of the user-agent string. It also includes data we want to track and measure that resides in our database. These, too, appear in "Measurement" as named events. In this way, data from different places is brought together as a collection of distinct events with one name ("Measurement") to mean "everything we want to measure right now." Important user data is essentially consolidated for ease of use, but is not compressed; each of the pieces of "Measurement" can still be examined on its own, as one, two or more pieces together, and so on. "Measurement" is not all or nothing.

2.4.2 Cube

Catch also uses a tool called Cube for time-series and other simple data analysis. Cube is a "subscriber" to the data Redis "publishes." Redis essentially says "Push this thing I'm listening for, called Measurement, to Cube." Cube provides an easy way to look user data in aggregate and drill into different facets of it.

Being able to drill down into facets of interest enabled us to discover the aforementioned registration problems Korean users experienced. We began "slicing and dicing" and viewing the data in ways available to us, and "Country" (shown in the "Measurement" example above) was one of the elements on which we could slice and dice.

We began with a time-series graph of login events to see the general shape of the data. As we changed the view by country, we noticed that the login data from Korea had a different shape. We looked at a few, randomly selected, individual (but fully anonymous) log files from Korea and, thanks to the time series view, had the horrifying realization that some users attempted to create new accounts for as long as eight to 15 minutes. Obviously, there was a problem, but we only found it was specific to Korea because of the data views we had. Future tests of changes made should show a reduction in registration problems, as measured by a reduction in the time required to complete attempted new registrations, and an terward, with failed registrations decreasing over time.

2.4.3 D3

While Cube is useful for some data visualization during analysis, D3 can more beautifully visualize data to a larger group of internal users. Technically, D3 is a JavaScript library for manipulating data contained in various document types, but this simply enables it to create quantitative, interactive visualizations for a large variety of data sets. This is important for technical communicators because there is finally a tool that makes Tufte-level data visualizations fairly easy to do.

D3 is built on familiar web standards like HTML5 and CSS, making it browser friendly for end users and enabling interface designers to style data with a standard like CSS rather than a proprietary format or expensive graphic design tool like Adobe Photoshop. These familiar standards also enable technical communicators to focus on choosing appropriate visualization(s) for the data and audience involved, and enabling users to access it through commonly available tools (like a browser), rather than learning how to use proprietary tool skills that don't extend to other software.

The availability of "big data" means that this work is never really static: because of inexpensive storage and improved analytical tools, many variables can be analyzed not just over time but on an ongoing basis, with new data being pulled in and added to the picture on a daily, weekly, monthly, and yearly basis. For this reason, tools that can do some of this ongoing work for the practitioner are key and, fortunately, there are several.

In summary, the use of freely available aggregation, analysis and visualization tools now make user data easier to manage, learn from, and display internally, creating a sort of dashboard view of potential usability issues as they happen.

2.5 Skills Needed

This section further shows why technical communicators are well equipped to address these challenges, where their skills are most needed, and what those skills are.

2.5.1 Researcher

As mentioned earlier, knowledge of qualitative research methods and interview techniques are approach people, observe them, understanding the data artifacts they create and/or manage, and extract and record a great deal of tacit knowledge.

User researchers must also interview "data consumers." Often, their data needs, phrased in their own words, don't match a data request they formulate for engineers. Here, the user researcher is a translator, aiming to understand what data people need, the problems they're trying to solve, and the questions they are trying to answer. This is not a new technique so much as a new application made more urgent by the availability of more data.

Finally, research includes data querying and cleaning, as mentioned earlier. Graduate-level research experience is particularly helpful here.

2.5.2 Data-based Study Design

User researchers and technical communicators skilled in study design can determine how best to quantitative user data before and during a study. They can also help to design what are essentially "ongoing studies," or automatic longitudinal data gathering; many more things can be tracked over lengthy periods of time, but it is not always clear when these techniques are most appropriate or useful.

2.5.3 Data Documentation

Documenting data used, as well as the tools and processes around it, is critical not just for current product development and experiments but to future work more generally. Some physicists, for instance, have called for better care to be taken of data after an experiment has finished [3]. Researchers from major labs, including CERN, formed a working group in 2009 called Data Preservation in High Energy Physics (DPHEP). Data degrading and being orphaned after experiments was only part of the problem: "Even given the raw data, only someone intimately involved in the original experiment can make sense of it" [3]. Documentation needs to include "internal notes that explain the ins and outs of analyses, to subprograms designed to massage numbers for specific experiments, as well as metainfo, the hacks and undocumented software tweaks made by a team in the midst of a project and then quickly forgotten." One of the aims of DPHEP is to create the new post of data archivist, someone within each experimental team who will ensure that information is properly managed. [3]

archivists, but most organizations, and technical communicators already possess many of these skills. They are, for example, skilled at designing document collections as well as individual templates for documenting fields (columns, rows) of data sets, their contents, and the meaning of those contents (real and intended); data locations; and metadata.

2.5.4 Internal Data Usability

There is a tremendous need in many data-drowning organizations for information designers who can turn data into usable, aesthetically pleasing products (whether for public or internal consumption or both) and intuitive interfaces. Usability practitioners are well poised to advise on data usability, ensuring not only that the people who need certain data can access it in the ways they expect (laptop, mobile, in and out of the office) but that the forms in which they need it are meaningful, enjoyable, attractive, and useful.

Further, usability practitioners and information designers are needed to suggest ways in which metadata is best integrated with data displays, to communicate to data users what they're seeing, and what data is higher quality and more trustworthy than others. All data is not created equal: some is noisier, dirtier, and not maintained as well as others. Such attributes are important for making decisions based on data.

Data usability is an area that is ripe for research by technical communicators and information designers. Best practices, particularly in regard to data visualizations with ever changing data, metadata, and myriad possible annotations, are sorely needed.

3 CONCLUSIONS

The increased quantity, availability and visibility of user data, some of which is usability data, accomplishes what Johnson et al. suggest, which is that the usability practice "develop a partnership between science and rhetoric between observation, representation, and statistical analysis so that we can ultimately o□er our best advice applicable to the situation at hand rather than, as science is want to do, definitively settle questions." Quantitative user data lends rigor to the usabil- ity practice while the popularity of methodologies like Agile reinforce the idea that things are evolv- ing and never settled, diminishing expectations for decisions to be "final."

This paper has shown some of the benefits of "big data" to usability, specifically more visibility of users (because data about the user, and thus user behaviors, are front and center) at all times; supplementary study data and data guidance of the design of observational studies; and the ability to track changes over time more easily, providing evolutionary rather than snapshot views of user behavior.

These changes are not without their drawbacks, which should be evaluated and researched further so their implications might be better understood. "Big data" creates more initial work for usability practitioners, a "never done" feeling with ongoing studies and data evaluation. It points to the need for practitioners to create best practices on data usability, not just product usability. Most concerning, user data creates a temptation to replace observational studies altogether; the most quantitative method may not always be the most appropriate. Finally, practitioners must help organizations to avoid "data survivor bias": the available data is the sample but is not necessarily the universe of data, or literal "all."

User data is, however, worthy of inclusion in the usability practitioner's toolbox. Its prevalence and quantity mark a major shift, and this paper has only begun to touch on its implications.

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