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Couldn’t be in New Orleans? Join the fun anyway as we report on the awards and other activities from the 2011 Annual Meeting in Inside ASIS&T. In addition we have Gary Marchionini’s acceptance speech for the Award of Merit. Gary, who began his professional life as a mathematics educator, views information science as being primarily about relations, drawing on this central mathematical concept for his inspiration. Finally, completing our Annual Meeting coverage in this issue, we have Diane Sonnenwald’s inaugural address. Diane is the first ASIS&T president based outside North America, and she has many important things to say about continuing the Society’s work on becoming an international organization. Among other things, she proposes to change our name to the ASsociation for Information Science & Technology, retaining the acronym, but expanding the scope. She also announces projects to plan annual meetings that allow more international participation and to review our by-laws and procedures to identify North American biases that create unintended difficulties for other members.

Additional Annual Meeting coverage will follow in our next issue of the Bulletin with reports on the two plenary sessions.

The special section in this issue also has a connection to the Annual Meeting, in particular, to the Workshop on Knowledge Management of Social Networks sponsored by SIG/KM. Heather Pfeiffer and Emma Tonkin, guest editors for the special section, have prepared some thought-provoking articles in this emerging area with emphasis on individuals managing their personal and professional faces on the web and on privacy issues. However, it also includes some other very engaging material, such as an analysis of what kind of information was “tweeted” and “retweeted” on the social network Twitter during the London riots this past summer. The challenges in managing information on social networks affect all of us at a very personal level, and I’m sure you will find much that is useful in this collection. My thanks to Heather and Emma for their extensive efforts to bring this material to us.
Inaugural Address
ASIS&T Annual Meeting, New Orleans, Louisiana, October 11, 2011

It’s a privilege to serve as ASIS&T president this year, and I wish to thank all members of ASIS&T for bestowing this honor on me. As some of you know I first began my professional career and Ph.D. studies in computer science and switched to information science in order to pursue my interest and passion in investigating the interplay of people, information, technology and social structures. As a result of this switch, I was introduced to ASIS&T for the first time and was pleasantly surprised by the welcome, encouragement and support ASIS&T members provided. I continue to be grateful for the welcome, encouragement and support.

On behalf of ASIS&T I’d like to thank Linda Smith and previous past presidents, as well as Dick Hill and the headquarters personnel, for all the work they’ve done and continue to do on behalf of ASIS&T. Linda and Dick have been especially gracious in answering my questions throughout the past months.

I also wish to thank everyone who has volunteered to serve in ASIS&T in the past and during this coming year. ASIS&T is your association; you can help shape it and shape the benefits you receive from it. Thanks to everyone who responded to my recent call for volunteers. I’ve contacted many of you directly, and Dick and I are in the process of asking this year’s committee, task force, jury, SIG and chapter chairs to contact you as well based on your interests with respect to volunteering.

Each recent past president of ASIS&T has advocated...
Networking internationally is increasingly important in academia, companies and other organizations because innovative practices, quality research and similar challenges occur across geopolitical boundaries.

internationalization of our association. Throughout ASIS&T and beyond there is increasing recognition that interesting and valuable practices and research occur worldwide, and our discipline continues to have an important role to play in that wide arena. As many of you know I’m the first person living and working outside North America to be elected president of ASIS&T, and internationalization will continue to be a priority this coming year.

In countries other than the United States, belonging to an organization that is named the American Society of Information Science and Technology can – in the worst case – be politically infeasible and, at best, challenging to justify. Names matter. What if our acronym, ASIS&T, stood for the Association for Information Science and Technology? That is, what if the “AS” in our acronym could stand for association, followed by IS&T for information science and technology? I hope we can have a discussion this year, and possibly a vote, regarding keeping our acronym but changing the words behind it and explicitly signalling that we are an association for individuals and institutions from all countries around the globe.

Networking internationally is increasingly important in academia, companies and other organizations because innovative practices, quality research and similar challenges occur across geo-political boundaries. Collaborating across boundaries can enhance what we do. Thus during the coming year we will investigate ways ASIS&T can provide more opportunities for members to network with colleagues from different geographical locations and across different topics in our discipline. Various options include holding geographically distributed satellite annual meetings that are interconnected via technology or holding an annual meeting outside North America. Increased travel costs to some geographic locations can be balanced by less expensive hotel, food and wifi access costs. In addition grants may be available from the hosting country to support the annual meeting. Mei-Mei Wu from National Taiwan Normal University will be leading this investigation.

Another planned activity is a review of our awards, bylaws and communication practices to identify North American biases and to suggest alternatives. Many award criteria and bylaws were established before ASIS&T had a significant number of international members, and they may not be in concert with current practices outside the United States. For example, an eligibility requirement for our Doctoral Dissertation Proposal Scholarship is a dissertation proposal accepted by the student’s institution. However, in many countries, Ph.D. programs in our discipline do not require a dissertation proposal or have a proposal approval process. What other rules may not reflect practices in other countries and limit participation? Several members have volunteered to help us identify these types of issues and to suggest possible alternative approaches.

As an association and discipline we have much to be proud of. On the occurrence of ASIS&T’s 50th Anniversary in 1987 President Ronald Reagan described the value of our discipline [1]. He wrote:

By advancing the gathering, storage and transfer of information, you’ve touched the lives of virtually every citizen and led the way to wider opportunity for all of us. That’s because our scholarship, domestic prosperity and competitive stance in the world marketplace depend as never before on our considerable information technologies and on how we use them. Your vital role in our increasingly efficient and wide diffusion of knowledge has been a tribute to you and a real blessing for our Nation.

Our discipline does not often receive this type of recognition and praise. Too often our discipline is less visible and subsequently less appreciated than other disciplines. For example, government funding agencies in a variety of countries either do not recognize our discipline as a discipline or classify it as one sub-discipline among many belonging to a larger discipline. Many of you may have experienced this first hand. One of the first times I was a co-principal investigator on a multi-disciplinary collaborative research grant, a new program director from the
Thinking outside the box and building on members’ innovative research and practices can lead to new, innovative individual and institutional member benefits.

Funding agency emphatically questioned why an information and library science researcher was working on the grant.

There continues to be a need to more effectively advocate on behalf of our discipline – on behalf of information professionals, information science research and information science education. Plans are underway to investigate this issue during the coming year with the goal of developing recommendations for the board and membership regarding ways we can more effectively advocate on behalf of our discipline. Sandra Hirsh and Prudence Dalrymple along with Marcia Bates will be leading this effort in collaboration with the Task Force on Information Professionals.

All associations should continually review and ensure the benefits they provide to both individual and institutional members are relevant, and ASIS&T is no different in this regard. Thinking outside the box and building on members’ innovative research and practices can lead to new, innovative individual and institutional member benefits. The ASIS&T webinar series introduced this past year is one such example, and my thanks to all involved in that effort. I hope members will contact me with proposals regarding innovations to provide new benefits to members and be a showcase for innovation in our discipline. We innovate for other disciplines and other organizations; can we innovate for our own?

At our next Annual Meeting in 2012, we celebrate our 75th anniversary. Robert Williams and Toni Carbo are chairing a task force that will be hosting several special anniversary events at the conference. The co-chairs for the 2012 conference hail from three continents: Crystal Fulton lives and works in Ireland, Julie Hershberger in North Carolina and ShanJu L. Chang in Taiwan. Both the task force and conference co-chairs look forward to your participation in the conference. In order to accommodate authors who are required to obtain a visa to attend a conference in the United States and who can only obtain a visa after their submission is accepted, the submission and acceptance dates are a month earlier for the 2012 Annual Meeting. The earlier dates also eliminate personal challenges that emerged in the past when authors, chapters and SIGs in the United States attempted to finalize their submissions over the Memorial Day holiday which co-occurred with the submission deadline. And the later meeting date provides more time for ASIS&T headquarters to assemble the conference program. This is an excellent example of how, when we take into account the needs of some, many others also benefit.

In conclusion I very much look forward to working with the committees, task force groups, conference co-chairs, the Board, the executive office and most importantly, with members, throughout the year. I value your confidence in electing me president and your generosity in contributing to ASIS&T and our discipline. Thank you.
ASIS&T Wraps Another Annual Meeting; Next Up is the 75th

The 2011 Annual Meeting of the American Society for Information Science and Technology, held in October in New Orleans, was judged by its attendees an “overwhelming success” and a great beginning for ASIS&T’s yearlong celebration culminating next fall with the 75th anniversary meeting (see additional information about the 75th Annual Meeting elsewhere in Inside ASIS&T).

For the 74th meeting, planners designed a meeting with broad appeal for the diverse interests represented by the fields of information science and technology. According to early evaluations, both practicing professionals and educators were out in force, joined by a large number of students at both the master’s and Ph.D. levels. Of those reporting, 82% declared the meeting “good” or “excellent.”

Join us throughout this issue of the Bulletin of the American Society for Information Science and Technology for a look at some of the work and fun that members and guests enjoyed at the 2011 ASIS&T Annual Meeting in New Orleans. Following a photo montage from the meeting, you’ll find full coverage of the ASIS&T Annual Awards presented at the conference. Elsewhere in this issue, other Annual Meeting coverage includes the inaugural address of new ASIS&T president Diane Sonnenwald and the Award of Merit acceptance speech delivered by former ASIS&T president Gary Marchionini.

Enjoy the look back at the 2011 Annual Meeting and make your plans for next year’s celebration. As one new student member attending the New Orleans conference said, the meeting was “phenomenal….everything was awesome – the sessions, posters, talks, New Members Brunch, student competition… meeting people from all over the world – it was incredible fun.”

ASIS&T Invited to White House Awards Ceremony

When President Barack Obama honored the recipients of the National Medal of Science and National Medal of Technology and Innovation – the highest honors bestowed by the U.S. government on scientists, engineers and inventors – the White House invited the American Society for Information Science and Technology to be among the guests. Executive director Richard Hill answered the call and was front and center for the ceremony on October 21.

In introducing the dozen recipients, the President reminded the audience that “America has always been a place where good ideas can thrive and dreams can become real – where innovation is encouraged and the greatest minds in the world are free to push the very limits of science and technology.”

The President then spoke directly to the interests of ASIS&T when he spoke of the global economy in which we live and compete which resulted in part from the technologies of the information age. “The key to our success has always been and always will be our unparalleled ability to think up new ideas, create new industries and lead the way in discovery and innovation.”
A Look at ASIS&T 2011
2011 Annual Meeting Coverage
2011 ASIS&T Award Winners

One of the highlights of each year’s ASIS&T Annual Meeting is the presentation of the prestigious ASIS&T Annual Awards. This year’s winners are featured in this section.

**Award of Merit**

**Gary Marchionini**, dean and Cary C. Boshamer Distinguished Professor at the School of Information and Library Science (SIL) at the University of North Carolina at Chapel Hill, is the 2011 recipient of the Award of Merit, the highest honor presented by ASIS&T. The award goes to an individual who has made a noteworthy contribution to the field of information science, including the expression of new ideas, the creation of new devices, the development of better techniques and outstanding service to the profession.

Gary is an internationally renowned scholar who has contributed a lifetime of extraordinary accomplishments to the field of information science. He excels in a number of research areas, including digital libraries; information seeking in electronic environments and interactive information retrieval; human-computer interaction and design; health information technologies; information policy; and, more recently, social media such as YouTube. His contributions have resulted in further development of thought, better techniques and outstanding service to the field of information science through sharing the results of his substantial research throughout the world.

Gary has published more than 200 articles, book chapters and technical reports on these research topics as well as publishing results of his research on the usability of personal health records, multimedia browsing strategies, personal identity in cyberspace and other areas of research. Several of his publications have been cited hundreds of times. He continually shares the results of his research at home and around the world, most recently as an invited presenter of the prestigious Ranganathan Lectures in Bangalore, India (three lectures). Earlier this year, Gary was appointed to serve on the President’s Council of Advisors on Science and Technology (PCAST) Health Information Technology (HIT) Report Workgroup.

Through a combination of research, teaching and service to the community, Gary has demonstrated his passion for improving the ways in which people use computers to find and use the information they need. At every step, he has demonstrated that he is an expert in this field of information science, standing above others by envisioning a need and then attacking problems with fervor and an enthusiasm unlike most researchers. He focuses on the impact of his work and reaches for the ultimate benefit to users of the projects and products of his efforts, changing the world for the better.

Because of his extraordinary range of contributions to the field, the 2011 ASIS&T Award of Merit goes to Gary Marchionini.

**Watson Davis Award**

ASIS&T’s Watson Davis Award recognizes the contributions of someone who has shown continuous dedicated service to ASIS&T. It is hard to think of one more worthy of it than **Bob Williams**. Apart from his uninterrupted membership of more than 20 years and his regular participation in the Annual Meetings of the Society, he has served on a range of the Society’s committees and juries. He was one of the prime movers in the addition of “history” to the charge for SIG/History and Foundations of Information Science. He has served several terms as chair of SIG/HFIS and almost continuously as a member of the planning group for the presentation of its sessions at the Annual Meetings. The creation and work of SIG/HFIS underpins his interest in promoting both the history of the field within ASIS&T and the history of ASIS&T itself.

Robert Williams holds his Watson Davis Award plaque.
With a small grant from ASIS&T, Bob developed the Pioneers in Information Science website which continues to be updated and contains entries for over 100 pioneers. Bob is always on the search for more oral histories to add to this valuable resource. He never misses an opportunity to recruit a new professional to the field or to encourage someone to be part of the Society that he calls his home.

Bob has been a champion and advocate for information science throughout his career. He has been instrumental in the design and development of University of South Carolina’s undergraduate program in information science and continues to teach and contribute to the BSIS program at the University of South Carolina. He also has worked on the institution’s doctoral program, writing grant proposals, mentoring students and teaching the information science courses. Perhaps most important are the thousands of students that he has mentored into ASIS&T. He is a beacon for knowledge and continues to shine on everyone with even a glimmer of interest in information science.

In addition, Bob is a true scholar, a gentleman and an absolute joy to work with. He brings ethics and professionalism to new meanings in his everyday communications with students and his professional communities. For his long, active and highly productive service to the Society, Bob Williams well merits the 2011 ASIS&T Watson Davis Award.

**RESEARCH AWARD**

**Christine Borgman**, presidential chair and professor of information studies at the University of California, Los Angeles, and fellow of the AAAS, is the 2011 recipient of the ASIS&T Research Award. Professor Borgman has contributed to information science research on a number of fronts. Fundamentally and quite uniquely, Christine Borgman covers four essential dimensions of information research: 1) user-oriented and usability aspects of information searching and behavior; 2) the evolution of scholarly communication and scholarly publishing; 3) information technology, library automation and digital library development; and 4) the East European information science scene. The quality of her research and the resulting publications in all these scholarly dimensions of information studies has had, and currently provides, a powerful and worldwide influence on information science in general and information searching and information history research in particular. Besides her more than 175 written contributions in the form of journal articles, books, proceedings and invited keynotes, Professor Borgman is highly influential as a coach and research supervisor in many parts of the world. She has had several long-term visits as an invited scholar and researcher at universities and research agencies in the United Kingdom, Italy and Hungary.

During her scholarly career she has been cited more than 1000 times, mainly as first author, excluding self-citations. It is also significant that a substantial portion of citations to her work derives from non-U.S. authors and journals worldwide. This demonstrates her ability to penetrate the information research landscape at a truly international scale. This international recognition is further shown on the well-known maps of information. She has won the ASIS&T Best Information Science Book award twice – for her 2007 book, *Scholarship in the Digital Age: Information, Infrastructure, and the Internet* and her 2000 book *From Gutenberg to the Global Information Infrastructure: Access to Information in the Networked World*, both from MIT Press.

Professor Borgman has led many collaborative research activities over the years. Currently, she leads the data practices team at the Center for Embedded Networked Sensing, a U.S. National Science Foundation Science and Technology Center based at UCLA.

Her major contributions internationally lie in the user-oriented sphere of information studies, foremost concerned with library catalogue use and usability –
for both adults and children. Her bibliometric and scientometric achievements are mainly on the analytic and theoretical levels in the area of digitized scientific communication. In this connection she has also made major research achievements in digital infrastructure, e.g., in the form of digital library developments, and she is recognized as an expert on East European developments in information and information technology for information services and libraries. In many senses Professor Borgman represents the best of information science scholarship, thus earning her the well-deserved ASIS&T Research Award for 2011.

**THOMSON REUTERS OUTSTANDING INFORMATION SCIENCE TEACHER AWARD**

The 2011 Thomson Reuters Outstanding Information Science Teacher Award goes to **Howard Rosenbaum**, associate dean and associate professor at the School of Library and Information Science, Indiana University. The award is presented each year to an individual who has demonstrated sustained excellence in teaching information science with evidence of sustained excellence and innovative and imaginative teaching materials and methods.

During Professor Rosenbaum’s career, he has designed and re-designed his courses, demonstrating, as one jury member said, a “commitment to combining classic and current theories and studies, to connecting theory and practice, and to challenging students to grapple with issues and problems and defend their ideas and proposed course of action.” His nominator commented on the service-learning components of his courses, which have included the redesign of websites for local businesses, as well as creating and operating online businesses. One student described his approach as embodying “the idea of teacher-as-guide, as he ensures access to knowledge rather than serving as the source of knowledge.”

Professor Rosenbaum’s influence as a scholar, teacher and mentor are far-reaching and long-lasting. His writings range from conceptual contributions on social informatics and structuration theory to more applied work describing his problem-based approach to teaching and learning. His articles are assigned reading for many information science courses. Current and former students comment on his accessibility for consultation and take him as their model of a mentor and advisor.

Throughout his career, he has demonstrated what one student calls “deep engagement, pedagogical and scholarly creativity and sustained excellence.” For his contributions as scholar, mentor, advisor and above all, teacher, we are pleased to name Professor Howard Rosenbaum as the 2011 Thomson Reuters Outstanding Information Science Teacher.

**BEST INFORMATION SCIENCE BOOK AWARD**

The 2011 ASIS&T Best Information Science Book Award, for a book published in 2010, goes to **Katy Börner** for *Atlas of Science: Visualizing What We Know*, published by MIT.

In the *Atlas of Science*, Katy Börner has generalized a key component of information science, drawing on all the relevant work in many fields, and brought it into the broader world of science in a particularly thorough and beautiful way. Börner’s fundamental interest is in informetrics, one of the three basic branches of information science, and the “atlas” is a series of representations of science through bibliometric means. She ranges across efforts made in many fields, but all from a scientometric perspective, and she gives full recognition to major scholars in information science who have contributed to that development. Börner has brought scientometrics fully into the spotlight of the 21st-century world of multimedia visualization. This is the sort of representation of informetrics that will get the attention of the wider world for information science. The author’s own agenda for visualization in the introduction and in the overall organization of the book makes it unique and distinct among comparable efforts. The *Atlas* is impressively designed and produced – a triumph of scholarship and a reader’s delight.

The international jury of scholars was unanimous in its evaluation of this book.
Bulleted as an extraordinary achievement of scholarship. They describe the book as a spectacular achievement not only because it is the result of a prodigious amount of scholarly work of the highest quality and because its subject matter is absolutely central to the interests of ASIS&T and its community, but also because of the work’s visual qualities and high production value, which will ensure that it will be widely read beyond the information field.

**John Wiley & Sons Best JASIST Paper Award**


The paper contributes to the theoretical basis of information science by giving an overview of two important fields and a better understanding of the relationships between their underlying theoretical constructs. The study is based on a thorough review of the literature resulting in the identification of the 17 theoretical constructs. It discusses the relations between two related subfields of information science: information searching and information retrieval. Information searching is human centered while information retrieval is technology centered but of the 17 theoretical constructs identified by the authors four are cross-cutting, i.e., relevant to both subfields. The authors also discuss whether the two subfields tend to converge or diverge in relation to the specific constructs. Convergence and the cross-cutting constructs allow collaboration between the two subfields. Such collaboration will contribute to enhanced user experience when seeking information and to increased research activity.

In the words of the authors, “An understanding of the foundational elements at the core of each field is essential to the objective evaluation of the field’s contribution and the perception of each field’s goals and objectives.” (p.1531)

**Thomson-Reuters Doctoral Dissertation Proposal Scholarship**

Amber Cushing, University of North Carolina Chapel Hill, is the winner of the 2011 Doctoral Dissertation Proposal Scholarship for Possession and Self-extension in Digital Environments: Implications for Maintaining Personal Information. Research on this topic will extend our knowledge of how people relate to their digital files. It may lead ultimately to development of policies and programs that will benefit individuals in deciding what to preserve and archivists tasked with curating contributions. Amber will apply Q-method to her analysis. While Q-method has been used widely in business, marketing and other fields, it is largely unexplored in information and library science. The method will allow her to focus on the factors that influence how people relate to the various types of information that they maintain in digital form. Amber has tested and refined the method in a pilot study, and she has made successful presentations of her work at several professional conferences.

**ASIS&T/ProQuest Doctoral Dissertation Award**

The 2011 ASIS&T/ProQuest Doctoral Dissertation Award is presented to Shelagh Kathleen Genuis, student in the School of Library and Information Studies, University of Alberta, Edmonton, Canada, for Making Sense of Evolving Health Information: Navigating Uncertainty in Everyday Life. This study spans boundaries among many areas within health services including nursing research, medical anthropology, women’s health, health literacy, consumer health and emerging phenomena such as digital...
health or e-health information, the rise of the e-patient, shared decision-making and participatory medicine.

This research crosses the multiple fields of information science, including information-seeking behavior, information decision-making, information resource management and information technology, and it brings fresh discovery to information science research. The findings raise new considerations related to knowledge translation as an ongoing process of social construction which takes place within everyday life contexts. The results highlight important implications for both information professionals and health professionals, particularly in the areas of health information literacy and shared information decision-making.

This research successfully employs qualitative techniques to explore formal and informal sources of health information and to facilitate response to uncertain health information from various sources, including health professionals, the media, the Internet and interpersonal contacts. Using a social constructionist approach and social positioning theory to guide semi-structured interviews (narrative and “elicitation” approaches) with information seekers and health professionals, the author investigates women’s information worlds and their engagement with information sources.

Pratt Severn Best Student Research Paper

Evaluated by the same rigorous standards as papers submitted for the Journal of the American Society for Information Science and Technology, the best student research paper is judged on technical competence, significance of findings, originality and clarity of expression. The 2011 Pratt Severn Best Student Research Paper Award, recognizing the outstanding work of a current student in a degree-granting program in the information field, goes to Brooks J. Breece, University of North Carolina at Chapel Hill, for “Local Government Use of Web GIS in North Carolina.”

The paper explores the impact of web-based geographic information systems tools on North Carolina county governments. As one juror noted, “This is excellent work for someone at the master’s level, showing a good grasp of the relevant literature from the various fields that contribute to this kind of interdisciplinary work.” Another reviewer stated that “it is an interesting and well-done research project in the intersection of information science and public administration.” “The literature review demonstrates a high level of competence in and familiarity of the GIS area. The use of various methods is welcomed. The analysis and discussion are thoughtful,” according to a third juror.

Brooks is commended on a well-executed project.

New Leaders Award

Eight ASIS&T members have been awarded 2011 New Leaders Awards, recognizing their potential for future leadership in the Society. Winners this year are Caroline Whippey, doctoral student, University of Western Ontario, Canada; Vivienne Houghton, MLIS student, University of Denver; Eugenia Kim, data services specialist, Purdue University; Julia Martin, EdLab, Teacher’s College, New York; Chysta Meadowbrooke, doctoral student, University of Michigan; Chaoqun Ni, doctoral student, Indiana University Bloomington; Jacob Ratliff, Archivist/Taxonomy Librarian, National Fire Protection Association; and William Senn, doctoral student, director of decision support, University of North Texas.

Chapter Awards

Chapter of the Year Award

The 2011 Chapter of the Year Award goes to the New England Chapter of ASIS&T, recognized for its extensive program of well-attended book clubs, social events and presentations, among other activities. These events are made possible by the conscientious and continuous participation by committed
members at regular business meetings. The detailed meeting minutes provide an excellent example to other chapters. The chapter engages in outreach activities, targeted at members and non-members alike. Such initiatives include a travel award geared to students. The support of students in all chapter activities was noted by one reviewer as the chapter’s investment in the future of our Society. The chapter is also commended for its involvement in national governance and events. The energy of the chapter is visible in their use of social media, which serves as an excellent vehicle for outreach and recruitment. For these well-executed outreach, recruitment and support activities, we honor the New England Chapter of ASIS&T with the 2011 Chapter-of-the-Year Award.

**STUDENT CHAPTER-OF-THE-YEAR AWARD**

The 2011 Student Chapter-of-the-Year Award goes to the *Simmons College Student Chapter*. The chapter hosted a number of heavily attended events with some well-known names among the speakers, including Peter Suber and Nicole Hennig. Working with the New England Chapter of ASIS&T, the student chapter hosted an event on Content Management Systems which enjoyed a large turnout of current GSLIS students, faculty and staff. Simmons recorded and podcasted many of their events, keeping them available on the GSLIS podcast website. The chapter also maintains an active listserv with more than 300 GSLIS community members, including current and former students, faculty and staff. The chapter also created a listserv for its board so that student leaders can come together in a virtual environment to plan future events. The strong chapter leadership and the chapter’s close bond with the GSLIS community make the Simmons College Student Chapter the Student Chapter-of-the-Year for 2011.

**CHAPTER MEMBER-OF-THE-YEAR**

The 2011 Chapter Member-of-the-Year award goes to Sarah Buchanan of the Los Angeles Chapter of ASIS&T (LACASIST). Nominating letters emphasize consistently the significant amount of work that Sarah does to keep the chapter active and running. Her knowledge of the history of both ASIS&T and LACASIST, as well as her ongoing involvement as a member of the chapter’s board, are further evidence of her commitment. Sarah’s contributions range from extended service as the chapter secretary to the planning of programs and developing LACASIST’s milestone 50th Anniversary celebration to the creation of a website devoted to the history of LACASIST. She has also worked with Robert Hayes to complete an oral history project that will be published. For this work and more, Sarah Buchanan is awarded the 2011 Chapter Member of the Year award.

**CHAPTER EVENT-OF-THE-YEAR**

Two awards for Chapter Event-of-the-Year are given to two different chapters for their individual events: one to the *Potomac Valley Chapter* and one to the *European Chapter*.

The *Potomac Valley Chapter of ASIS&T* is awarded the 2011 Chapter Event-of-the-Year award for “An Evening with National Public Radio.” The event enjoyed a good onsite attendance, but greater benefit was achieved when the event organizers reached beyond the chapter borders to broadcast the session as a webinar viewed by over 100 online participants. Speakers described how a story is born and discussed the integration of the librarian role into the work of broadcast program staff members. Topics presented the perfect combination of information science and technology, and the event was relevant, informative and fun. For these reasons, the Potomac Valley Chapter earns the 2011 Chapter Event-of-the-Year Award.

The *European Chapter of ASIS&T* is awarded the 2011 Chapter Event-of-the-Year award for the “ASIS&T European Workshop 2011.” Event organizers reached out across Europe for attendance from professionals from eight countries. This outstanding event brought together members and non-members of ASIS&T,
and it served to promote the entire society throughout Europe. Students, faculty and industry experts talked on a variety of relevant topics, including knowledge organization, information retrieval, social media, digital cultural heritage and technology applications. Additionally, organizers were able to get industry sponsors to help with expenses for student attendees. The European Chapter is to be most highly commended for the dedication and drive needed to produce a two-day workshop of this caliber and merits the award for 2011 Chapter Event-of-the-Year.

**CHAPTER INNOVATION-OF-THE-YEAR**
The 2011 Chapter Innovation-of-the-Year award goes to the New England ASIS&T Chapter (NEASIST) for their meet-up, “All Things e-Readers.” Participants gathered to share their experiences of reading on Kindles, iPads, Nooks, smart phones and other devices, and they shared ideas on how to negotiate licenses, catalog books on Kindle and manage patron expectation for using devices and accessing material. As librarians struggle to develop e-content policies and deal with an assortment of issues surrounding e-reading, the New England Chapter provided a way for participants to test available technologies and discuss implications and ideas for implementation in their diverse organizations. This inventive gathering earns NEASIST the 2011 Chapter Innovation-of-the-Year Award.

**SIG AWARDS**

**SIG-OF-THE-YEAR-AWARD**

SIG/Digital Libraries (SIG/DL) is the 2011 ASIS&T SIG-of-the-Year. SIG/DL presented an impressive array of year-round programming, membership recruitment and retention, and leadership development activities. This SIG not only presented panels and a workshop at the 2010 Annual Meeting, but also planned and sponsored two webinars during 2011. This programming represented a range of interests, particularly in the institutional repository community.

SIG/DL used an online election process for its 2010-2011 officers, the result of which was dramatic improvement in SIG member participation and identification of new officers prior to the 2010 Annual Meeting. After the meeting, SIG officers kept in contact with members and interested non-members through their Facebook and LinkedIn pages and Twitter feeds, and the officers followed up by email after the Annual Meeting with attendees of their business meeting. Officers and interested members held planning meetings online multiple times during the year; one of these was archived so non-attendees could view the discussion after the fact.

The SIG notes the ongoing relationship between the SIG leadership and the SIG’s New Leaders Program awardee, Tina Jayroe, highlighting the role she has played in outreach and the use of social media for SIG activities. Finally, SIG/DL is working to develop members and potential members through an analysis of the membership lists of the SIG, the SIG listserv and the Facebook and LinkedIn pages. SIG/DL is a role model for other SIGs looking to develop its membership, particularly among members unable to attend Annual Meetings. SIG/DL is a worthy winner of the 2011 SIG-of-the-Year Award.

**SIG MEMBER-OF-THE-YEAR**

Diane Neal of SIG/Classification Research (SIG/CR) is the 2011 SIG Member-of-the-Year. Diane was instrumental in the rejuvenation of SIG/CR, including acting as its first chair for several years. Under Diane’s leadership the SIG recruited new members, continued the popular SIG/CR Workshop at the 2010 Annual Meeting and helped plan a popular session for that meeting. Diane’s recommenders write about her impressive ability to bring together multiple voices in fruitful discussion, particularly at the workshop. One reviewer of her efforts with the SIG/CR Workshop says “... she
designed a program that was provocative and stimulating in its format… which led to one of the most honest, open and insightful discussions I’ve ever encountered…” For her work rejuvenating SIG/CR, and particularly for her work to expand and grow the SIG to include a broad range of members, Diane Neal presents an example to leaders of all levels in ASIS&T and earns the 2011 SIG Member-of-the-Year award.

**SIG Publication-of-the-Year**

SIG Publication-of-the-Year honors for 2011 go to SIG/International Information Issues (SIG/III) for its SIG/III Newsletter. This PDF newsletter contains a welcome from the chair, minutes from the last meeting, reports from the 2010 Annual Meeting sessions and information about sessions proposed for 2011, bios of the InfoShare awardees, contact information for officers and other information about the SIG that is of interest to members. This well-written and comprehensive communications tool is a model for a SIG newsletter. Congratulations to SIG/III for the hard work and great results.

**ASIS&T 75TH ANNUAL MEETING**

Get Ready to Celebrate All Things Information

In honor of the 75th anniversary of the American Society for Information Science and Technology, the 2012 Annual Meeting will focus on Information, Interaction, Innovation: Celebrating the Past, Constructing the Present and Creating the Future. Weaving together all the threads that make the tapestry of information science, this landmark conference provides a great opportunity for practitioners and researchers to reflect on our past accomplishments and current activities and to chart potential pathways for the future.

Conference planners will utilize three reviewing tracks to ensure high standards and quality, as well as broad coverage of the field. The three tracks and their emphases are

- Information: topics related to metadata, information retrieval, organization of information, knowledge management, information architecture and more
- Interaction: topics related to information behavior, information sharing, human-computer interaction, gaming, visualization and more
- Innovation: topics related to emerging technologies, Web 3.0, innovations in digital libraries, cloud computing and more.

The 75th ASIS&T Annual Meeting will be October 26-31, 2012, in Baltimore, Maryland. For full details about the Call for Papers and deadlines for submissions, please visit the ASIS&T website at asis.org.

**News from ASIS&T Chapters**

The Northeast Ohio ASIS&T chapter (NORASIST) has an innovative weapon in its membership recruitment bag: a membership sale, providing discounted membership rates for student and regular members living in Northeast Ohio. For the second year, the chapter invited new members to join at a discounted rate and to attend the annual fall social mixer in September. New student members could join ASIS&T and the local chapter for $32 – just $2.50/month – during the membership sale period.

The chapter further encouraged new members by offering the first five people to join at the mixer free books from Rosenfeld Media, personally donated by Lou Rosenfield, one of the fathers of Information Architecture, and co-author of Information Architecture for the World Wide Web: Designing Large-Scale Web Sites.
Former ASIS&T president Debora (Ralf) Shaw, longtime faculty member at Indiana University (IU), has been named dean of the university’s School of Library and Information Science. IU executive vice president and Bloomington campus provost Karen Hanson made the announcement, noting that Ralf “has received strong support from SLIS faculty and staff as interim dean. She has served with distinction as interim, providing energetic and effective leadership of the school.”

The National Technical Information Service (NTIS) and Information International Associates (IIa) have formed a joint venture to develop an institutional repository (IR) service for federal agencies. Institutional repositories are collections of digital scientific and technical information documents and other content. This repository will be hosted by NTIS and supported by content managers and technical experts from IIa and NTIS. The program will make federal agency content available to users with increased ease of access and provide cost savings to the agencies. Representatives of both organizations will provide more details to the Bulletin as the project develops.

The School of Information and Library Science (SILS) at the University of North Carolina at Chapel Hill (UNC) announces that professor Richard Marciano, co-founder and former executive director of the Data Intensive Cyber Environments (DICE) Center, affiliated professor in American studies and director of Sustainable Archives and Leveraging Technologies (SALT), is now co-founder and co-director of a new virtual lab that will encourage collaborative, interdisciplinary and innovative digital humanities projects.

The Digital Innovation Lab, affiliated with the American studies department in UNC’s College of Arts and Sciences, will encourage the production of digital “public goods”: projects and tools that are of social and cultural value; can be made publicly available; are scalable and reusable; and/or serve multiple audiences. One immediate focus will be the use of large-scale data sources – maps, newspapers, city directories, public records – by scholars and the public in understanding the history of communities. The lab (http://digitalinnovation.unc.edu) was created with a startup grant from the college.

The lab will build on the nationally funded digital humanities work of Marciano and Robert Allen, co-founder and co-director of the lab. Allen is the James Logan Godfrey Distinguished Professor of American studies, history and communication studies.

University of Illinois at Urbana-Champaign (UIUC) has received a $390,000 grant from the Andrew W. Mellon Foundation for a project entitled Music Information Retrieval Evaluation eXchange: Next Generation (MIREX: NG). Led by J. Stephen Downie of the Graduate School of Library and Information Science, the project runs from October 1, 2011 through December 31, 2013. MIREX, which Downie has directed since 2005, allows music information retrieval (MIR) researchers to come together to investigate how well their innovative MIR algorithms perform. MIREX has played a pivotal role in the growth and success of the MIR research community, having performed more than 1200 evaluations of algorithms across 23 unique task categories.

In partnership with experts from Ithaka S+R, the MIREX: NG project will allow Downie to develop formal models for the financial and administrative sustainability of MIREX. Once the organizational structures have been created, the partners will work with the MIR community to finalize and then implement a sustainable business plan model to ensure the long term vitality of MIREX.

The International Calendar of Information Science Conferences (icisc.neasist.org) is a nonprofit collaboration between the Special Interest Group/International Information Issues (SIG/III) and the European (ASIST/EC) and New England (NEASIST) chapters of the American Society for Information Science and Technology, with the additional support of Haworth Press.
Accepting the ASIS&T Award of Merit for 2011, Gary Marchionini reflected on his early career in mathematics education and its synergies with information science. He observed that information scientists are connectors and that the field itself is based on establishing connectivity. We create mappings or links between elements, such as maps between search queries and documents, between databases and information objects, between concepts and taxonomies, between searchers’ mental models and interfaces. Mapping such relationships is similar to a bridge spanning spaces and cultures, a linchpin coupling an engine and load, and a membrane regulating cellular transport in that each relates sets of properties. In the sphere of human interactions, relationships enable us to move from “I” to “we.” Marchionini expressed appreciation for connections made through ASIS&T and looked ahead to making and studying intellectual and social connections in the field and the organization.

KEYWORDS
connectivity
information mapping
professional associations
honors

Gary Marchionini, a past president of ASIS&T, is the recipient of its 2011 Award of Merit. He is dean and Cary C. Boshamer Professor, School of Information and Library Science, University of North Carolina, Chapel Hill, where he also heads the Interaction Design Laboratory. He can be reached at march<at>ils.unc.edu.

I would like to thank the ASIS&T community for honoring me with the Award of Merit. None of the work that is recognized in this award could have been done by me alone. I have benefited throughout my life from gifted students, colleagues, friends and family. Many of you are here today, including my wife Suzanne, and this award is a testament to the strength you have all brought to our collective action.

When I came to this field 28 years ago, arriving as an interloper from mathematics education, I was welcomed and encouraged to forge bridges rather than burn them. I think this is a fundamental characteristic of information science and the people drawn to it. For me, the first few years of transition were filled with parsing the tokens of primary concepts (who is that guy MARC and why does everyone talk about him?) and discovering synergies among what and how I knew and what I was learning. Perhaps the most important insight that served as a critical bridge for me in those early years of my transition was that information seeking is a learning function.

It seems to me that the people who come to information science are connectors. We share values such as intellectual freedom and diversity, universal access, self-directed learning, organization, collaboration, trust and stewardship. It is these shared values that define our field more than our methods, problems or products.

I believe that the information science discipline and our community are inherently connective. Connectivity is a double-edged sword – powerful but dangerous to use. “Pure” disciplines stand alone and grow through elaborations and challenges to their core principles or canon. Interdisciplinary or what Marcia Bates calls meta disciplines cross boundaries and grow through synthesis and coordination. But they often struggle to establish
potency. In the few minutes I have today, I want to reflect on connectivity in our field and in the work that information professionals do.

I suggest that information science is in search of a theory of relationships. People find precise and universal relations quite beautiful; for example, the relation between the diameter and the circumference of a circle is a constant. It is quite extraordinary to think that whether the circle is the head of a pin or the sun, this relation is always pi. A binary relation is most generally defined as a proper subset of the Cartesian product of the set. Any arbitrary mapping of element pairs is, of course, a relation. The way this relation is formed is what is interesting, and we give special names to some of these mappings, such as isomorphism.

Our interests as information scientists tend toward n-ary relations among abstract or subjective elements. Lawrence Heilprin once told me that the fundamental problem of information science is compression, as illustrated in the creation of abstracts for longer works. He wrote about different types of relations that preserve distinct properties (for example, the homeomorphic relation between a coffee cup and donut make them topologically equivalent). There are an infinite number of relations possible between the donut and the coffee cup depending on the kind of mapping we choose such as weight, color, functionality, likeliness to be used as a weapon, appeal to ants and so on ad infinitum. Information science is about identifying and leveraging mappings that are interesting or useful, and information professionals earn their pay by excelling at creating these mappings.

We are concerned with selection of mapping functions: We select meaningful relations such as catalogs that link metadata to information objects, or books to library communities, or digital artifacts to preservation functions. Our work at UNC with Open Video for example, aims to identify and evaluate mapping videos onto useful video surrogates such as storyboards, fast-forwards or snippets that facilitate gisting. Information scientists work to map utterances or character strings we call queries to information objects we call documents. We create bibliometric databases that relate information objects, authors, institutions or fields. We develop taxonomies and ontologies that relate concepts, search engines that relate web objects and social media that relate people. We ponder recommendation systems that relate people to products or to other people and investigate text corpora to identify subtle properties such as sentiment, bias or intention. Much of my work in human-computer interaction and interactive information retrieval aims to find mappings among information seekers’ mental models for an information problem, different representations of information resources and control mechanisms for changing those representations we call the mappings interfaces.

Lately, I am interested in the relations between our physical and digital lives. Under what conditions are they distinct or blurred? What are the mutual dependencies? How might we manage critical characteristics such as ephemeralness and persistence? Where is the “I” in cyberspace? My students and colleagues tease me when I make up words so I will not give the lecture on proflection of self today :-(
Any one of these examples of information work could occupy a lifetime of research and practice, and I am certain that there will be countless new mappings identified that keep us engaged and employed. For example, imagine how the relation of “friend” as expressed in social media will be elaborated, leveraged and riffed in the years ahead. What I would like to see is some attention to the nature of relations in general rather than only identifying specific new relations. Rebecca Green attacked this problem in her dissertation on syntagmatic relations 25 years ago as did Randy Trigg in his dissertation of that period that characterized hypertext link types, and I would like to see more work like this that attends to the nature of classes of relations.

Consider three kinds of physical connectors as metaphors for thinking about kinds of relation mappings. A physical linchpin strongly relates an engine and load in a highly constrained coupling that resembles a constant binary relation. What are these constraints? What are the necessary and sufficient properties of the engine and load that determine them? In contrast, a bridge relates spatial extents; it may be one-way or two-way; there are load constraints, and there may be control mechanisms such as inspections or tolls. We know that a bridge meant to span a physical space can also serve to span cultures. In this regard, we might consider that relations propagate. How is this relation different from the linchpin? Finally, a cellular membrane selectively relates nutrients and wastes between cells and the ambient media. There are both simple and highly complex transport mechanisms that regulate these exchanges and sustain cell life. A theory of relations will explain what linking properties are common across each of these kinds of connectors. It is these linking properties that define relations and relations that in turn enable human interaction with information and with other people. Relations allow us to get from “I” to “we.”

In closing I want to return to the intellectual and social relationships that I experience in our field and in ASIS&T. It is telling that so many of our conference themes, including this year’s “bridging the gulf” theme, speak to making connections. Ours is a field and a society devoted to making and studying connections. As individuals, we select the relations we want to develop into meaningful relationships, and I am thankful that I chose ASIS&T and that ASIS&T nourished me. Thank you for your partnership and for this wonderful award.
Personal and Professional Information Management
by Heather D. Pfeiffer and Emma Tonkin, Guest Editors

EDITOR’S SUMMARY
Managing perceptions about personal and professional information on the social web is the focus of this Bulletin issue. Contributors offer insights on analyzing our personal presence online to determine whether it accurately reflects ourselves as we intend and on actively creating a personal knowledge profile. We can gain some control over our personal information and its unintended spread by separating social networking with personal information from professional web content and using privacy settings. The importance of user monitoring and participation is emphasized in observations about personal health records. Tools are being developed to limit software that accesses context-aware personally identifiable information. Information sharing and reuse can perpetuate false information, though content analysis of tweets about a series of events shows that irrelevant and contradictory Twitter comments fade rapidly from circulation. Knowledge management within organizations is spotlighted to explore how enterprises learn, grow and are affected by each other in a competitive environment. The many examples presented demonstrate the urgent need to actively manage the proliferation of personal and professional information on social networks.

KEYWORDS
personal information  accuracy
social web  false information
information management  Twitter

NOTE: This special section is presented by Special Interest Group/Knowledge Management (SIG/KM). Five of these papers were presented at the recent ASIS&T Annual Meeting at a SIG/KM workshop entitled Knowledge Management of Social Networks [1]. Two papers of particular relevance to the topic of this issue (Sarabia & Obeso and Al-Fedaghi) were also selected and added from presentations made at 2010 International Conference on Knowledge Management (ICKM 2010) [2].

In this age of web-based knowledge and information transfer we must be aware of how we are perceived both from a personal and professional viewpoint. Multiple social networks – from Facebook to LinkedIn – are available for everything from personal communication with family and friends to having notable colleagues write recommendations for us to enhance our chances of finding good jobs. All of these networks allow us to “paint” an image of ourselves, thereby dispersing and managing knowledge about us.

We want some of the information or knowledge that we input onto a social network to be viewed only by personal friends, while other information is intended for potential employers. To accomplish our intent we must be careful about our security settings and where and how we publish our information.

Facebook, Flickr and similar sites are social networks that are designed to let us communicate and share information such as opinions, photos or stories with our friends and family members, but if our settings are incorrect, these sites will also share our information with friends of friends and possibly the public. If we make negative comments about our jobs on social networks, we need to make sure that bosses, co-workers or even potential employers do not see these statements. With these issues in mind, Donyelle Murdock helps us analyze our presence on the web and think about how we want to represent ourselves through our personal information profile.

To control our personal information profiles, particularly our professional profiles, it may be useful to organize personal information through outside, non-web, means such as resumes. In their article, Teresa Jones and Deborah Swain suggest that we can then import that designed information into our
social network account. Even making more than one account for specific proposes is useful. Jones and Swain also make many practical suggestions about how to maintain a positive, professional image. In particular they emphasize that if you wish to communicate your professional face on the web, LinkedIn is an important tool.

Like Murdock and Jones & Swain, Denise Bedford discusses techniques to organize and present views of ourselves on the web, emphasizing the concept of personal knowledge management (PKM). She discusses how to develop a profile and determine and enforce privacy levels that would be appropriate to various kinds of information about us that might be incorporated into such a profile or controlled through it. However, some of these techniques are conceptually easy to design, but not so easy to apply.

As we organize our personal information, privacy is a major consideration. Sabah Al-Fedaghhi discusses being context-aware about our information in applications such as ubiquitous computing and how the privacy levels of such data might be determined. He develops tools that could be used by requirements analysts to make such decisions, but warns that these tools may sometimes fail to adequately manage personal data. Even if we are careful to monitor the information that we publish, we cannot know how it will appear in the context of current events.

Information on social networks can have much wider ramifications than just its impact on our personal information management issues. Many of the social networks available are designed for different communication techniques; for example, Facebook is generally used for communicating stories, events, articles seen and other information that can be quite lengthy; Flickr permits users to organize and display photos and videos; and Twitter allows the publication of short text messages (as well as links and snapshots). Each of these networks (and there are many more) may be used for purposes that their designers never imagined. In the article contributed by Emma Tonkin, Heather Pfeiffer and Greg Tourte, the authors look specifically at Twitter’s use during the London riots in the summer of 2011. They analyze what information we share out in the public, wondering whether there is evidence that social networks are used for inappropriate purposes. They observe that, even though the popularity of the source of a tweet affects how often it is retweeted, users do not retweet information that violates their own belief systems. Even though there are widespread claims, notably from politicians and the traditional media, that social networks perpetuate false information and communication that causes unrest in society, the analyzed results do not support this claim.

The last two articles in this special section give specific examples of places where knowledge is managed and organized in the world today. Social networking, imitation and information sharing are not just interpersonal phenomena, but inter-organizational as well. Maria Sarabia and Maria Obeso discuss how knowledge can be used for learning within small and medium-sized enterprises (SMEs). Knowledge gained through employees as well as through heads of companies can affect the business. Making educated guesses about how competitors are operating can also affect how well a business does. These two forms of knowledge, internal and external, can then be learned by the enterprise in order to improve the company’s performance down the road.

Finally, while many businesses have now taken to operating and providing information online, governments at all levels are also heavily involved. Charlene Johnson and Deborah Swain explore the sensitive topic of electronic patient records by describing how veterans in the United States can manage their medical data totally online. They emphasize the security and access requirements necessary to protect this data for its specific user.

In conclusion, social networks present challenging knowledge management issues at all levels – for individuals, organizations, communities, businesses and governments. In this issue we emphasize the personal aspect and point out that all of us need to be conscious and active in knowing what information exists about us in social media and in managing to see that the information is protected with the appropriate levels of security and privacy. As the Bedford and Al-Fedaghhi articles illustrate, there is also an extensive research agenda around these issues, as there is around the broader social implications discussed by Tonkin, Pfeiffer and Tourte. ASIS&T SIG/KM asks interested researchers and practitioners to join us in exploring these important developments.
Analyzing Personal Presence on the Web and Building Your Brand
by Donyelle Murdock

EDITOR’S SUMMARY
The web is a vast collection point for data about individuals and organizations, whether true or false, flattering or misrepresentative. Since checking a person’s background, credentials and professional and social circles has become routine, we should be aware of our own digital footprint and actively manage the information available about us to ensure it reflects the image we want to project. Building a personal brand online should be based on active involvement, including reading blogs in our interest areas and participating in blog discussions. It is important to use one’s real name to avoid falling liable to misidentification. Having a Facebook page permits one to build and control a network, and exploring Twitter enables one to keep up with and contribute to current communications on topics of interest. By proactively building our personal brand online, we can control our identity, image and reputation in the digital world.

KEYWORDS
social web
personal information
false information
social networking
user profiles

As the new web and cloud computing world changes, will the information about it change accordingly? The question that more than often poses itself is: How do we control and manage that changing information? In the last 10 years more information has been made very accessible to the public via the Internet. This statement is not to say that the information wasn’t available before, but now it is more accessible. Not only is information about our world changing, but also information about the people who live in it.

In this technologically advanced society information is at our fingertips 24/7. Some information is the type that some people shouldn’t have access to. For example, it is fairly easy for a sexual offender to find out the campus layout of a child’s school. This access is possible because so much information can be found via the Internet. By the same token, it is simple for an admissions counselor to find information about potential students on the web. The question then becomes: How can I make sure the information available about me on the web reflects who I really am? As a prospective student living in Florida, it may not be easy to visit personally every institution to which one applies. Therefore, that prospective student needs to make sure that his or her first impression, whether in person or via a web profile, is a great impression.

Having a healthy web profile gives you the opportunity as an entity or part of an organization to have more hands-on control over the information available about you. More important is knowing how to edit and manage information inconsistency. What does my digital footprint say about me? Is there more than one person with my name? Being informed about your image is the most fundamental aspect when trying to build your brand properly. As Houghton and Joinson [1] have shown in survey research, users
of social networking sites are concerned about privacy. This article responds to those concerns with tips and advice on how to manage Internet knowledge about yourself while still enjoying social networking sites.

In 2008 Will Richardson, co-founder of Powerful Learning Practice, wrote the following:

As the geeky father of a 9-year-old son and 11-year-old daughter, one of my worst fears as they grow older is that they won’t be Googled well. Not that they won’t be able to use Google well, but that when a certain someone (admissions officer, employer, potential mate) enters ‘Tess Richardson’ into a search line of the browser, what comes up will be less than impressive. That those quick surfs through the top five hits will fail to astound with examples of her creativity, collaborative skills and change-the-world work. Or even worse, that no links about her will come up at all. I mean, what might ‘Your search did not match any documents’ imply? [2, p.16]

Richardson had a point. It is understood that for some information you have no control over its use and dissemination. But at some point, everyone, and I do mean everyone, should be knowledgeable or at least have a handle on the information available about them via the web. Not only should professionals worry about their information, but their children’s information as well. Someone could unknowingly put their children, co-workers, family – or any constituent, for that matter – at risk. Everyone should also be mindful that the information they make available does not hinder anyone else’s brand building. It would be a conflict if a student were trying to portray him or herself as a young professional via a Facebook page or if a “friend” failed to disclose that the latest house party pictures were posted and tagged, making the images available to multiple users of the social networking site.

Once some information has been disclosed without your knowledge, what is the next step? Again the questions are: How do I make sure that I am being Googled well? What are the necessary steps to take to create a positive image of myself on the web? Concerning my collegiate peers, the bigger question is: Is this even important? Yes! Managing your personal image on the web is very important and doing so is worth the added stress. Your brand is important on the web, because, in essence, it’s the first impression you make with most people who want to know more about you and the things with which you are affiliated. If you take the time to maintain a professional demeanor, including professional dress, an impressive academic circle and being aware of your formal and informal conversations, then maintaining your personal brand online should be a no-brainer. Students and professionals alike should make an effort to clean house. I am referring to the person who has 3,692 friends on Facebook. Keeping your constituent circle smaller leaves less room for someone to unknowingly hinder your building a brand or identity. It makes sense to be friends with your friends, but just randomly having information available to people you do not know is potentially dangerous.

Who Wants to Know?

What are people looking for anyway, one may ask? Most Googlers want to find information about you, your friends, your job or university and to confirm your credentials. In some cases, boredom can cause a person to search for just about anything. Having idle time, whether in the airport, DMV office or a traffic jam, can lead to a very informative Google search. (Please be advised that I am not an advocate for using cellular and mobile devices while driving. It is dangerous and can cause fatal injuries. Also, it is illegal in most states.)

As a student, I may Google-search my professors to get a better feel about who they are. Where are they from? Where did they teach and for how long? Where were their degrees awarded? Having access to this information is key because there have been many situations where professionals falsify their credentials. For example, the dean of admissions at the Massachusetts Institute of Technology was fired for falsifying her credentials [3]. Who knows what an in-depth Google search would have found? Students want to know whether their professors have any relevant coursework concerning the particular course they will be instructing. My searching for information will reveal only two things: either the professors are who they say they are or the information that results from the search, as Richardson [2] stated, is “less than impressive.”

Chances are very high that someone will Google our names and affiliated institutions on a daily basis. Yes, you can be searched for without giving
permission. Because this interaction seems to be inevitable and ongoing without needing permission, measures should be taken to make sure the right information will be available to the right people. You can’t believe it’s that important? Studies show that many employers and staffing companies search for potential employees on Facebook pages. In fact, employers may now ask for online social-network usernames on pre-employment applications and use these tools to screen potential candidates. For the most part, human resources professionals use part of, if not their entire, real name in order to aid in their search for the correct individual.

Steps to Build Your Brand

So what are the proper steps individuals should take to ensure that their online images properly represent their brands? While there is no true science to building a personal brand via the web, many experts have proposed strategies that they think would assist in the effort [4]. Earlier, I mentioned being familiar with your digital footprint. According to one Webster dictionary, a digital footprint is defined as a collection of activities and behaviors recorded when an entity (such as a person) interacts in a digital environment. What would a search of your Internet browser links reveal? Are you doing more online shopping than researching information about your particular field? What are you interacting with in your digital environment? Would you be considered a workaholic, as all your web searches concern academic topics? Is it conducive to your brand? This evaluation is the first step to building your brand.

Becoming engaged with relevant topics is essential. According to Richardson [2], there are five main steps, discussed below, to help build a personal learning network, but they are also pertinent to building a better brand. While there are many other experts offering DIY (do it yourself) brand-building steps, I feel that his are the most up-to-date and relevant. Your web presence will revolve around the avenues used to communicate. Communication via the web is now a standard for most professionals around the world and vital to many families and sets of friends. It is important that we concentrate on the avenues used to communicate in this digital world especially when privacy has been proven to be hard to protect [5].

Richardson’s five steps are as follows:

1. Read blogs related to your passion.
2. Participate.
3. Use your real name.
4. Start a Facebook page.
5. Explore Twitter.

Step One: Read blogs related to your passion. Search out topics of interest at http://blogsearch.google.com, and see who shares those interests. For example, if you’re a “techy” visit open-source sites and search for software relevant to your interests. It’s okay to surf the web. Most digital footprints are composed of email correspondence and published work. Some forget that the web can be used as a personal pastime, too. Of course, it’s not baseball, but I don’t believe surfing the web is very far from being a sport. The Internet offers a plethora of topics from politics and sports, to homemaking tips and car tuning. Take advantage of available topics, and if there isn’t a market for your particular interest, now would be the perfect time to create a new genre. Being innovative is very attractive to potential employers and colleagues. So go for it!

Step Two: Participate. If you find bloggers out there who are writing interesting and relevant posts, share your reflections and experiences by commenting on their posts. This recommendation does not give a green light to engage in a full-blown blogger war with someone who may not share your passions or views. Remember you are in control. You do not have to befriend someone on Facebook. Twitter’s social network has a similar setup, as users must become “followers” to have access to the information you blog. Make the necessary decisions needed to maintain a professional profile. Remember affiliation plays a huge part in building your brand. It doesn’t make sense to befriend the town’s drunk when your potential employer is the AA. The same goes for web presence. You shouldn’t befriend a fellow blogger known for offensive rants or narrow-minded views. You are being held accountable for your own actions. So participate with caution.

Step Three: Use your real name. It’s a requisite step to being Googled well. Provide sparse information with caution, of course, as giving any personal
information puts you at risk. Using your real name is very important, however. There is a chance that someone else may be found during a search intended for your information. This error can cause a problem, as previously stated, in which the right people will not be getting the right information. Make sure that you tie up loose ends like maiden names and or a recent marriage. Making sure that accurate information about you is available in a one-stop shop will improve your Google search results. Using websites like http://about.me gives users an opportunity to provide good information in a one-stop shop. Some people fall into a smaller category of “the damage is already done.” This category means that some users need more advanced options concerning managing their web presence. There are more advanced steps available as a solution for the double-identity search issue. Google has created a service called Google AdWords. This service gives users the opportunity to ensure that specific information is made available when users search for specific keywords.

**Step Four: Start a Facebook page.** Educators and students need to understand the potential of social networking sites. Along with its potential come its threats. Ensure that you are well informed of the social networking sites that will be used in personal brand building. For example, the following links are reports of Facebook’s latest security blunders:

- [www.dailymail.co.uk/sciencetech/article-2042573/Facebook-privacy-issues-Social-network-watching-youre-logged-out.html](http://www.dailymail.co.uk/sciencetech/article-2042573/Facebook-privacy-issues-Social-network-watching-youre-logged-out.html)

Facebook is by far the leading social networking site, having overtaken the very popular MySpace in 2008. The functionality and security features of Facebook are in a constant state of flux. If you have not created a Facebook page, there is now an option to separate constituents into categories. In 2011, users were granted the additional option of separating their collegiate friends from their professional references. Most users of Facebook know that this social networking site is a mecca of information, from professional networking to much less interesting information that would be more important to an eighth-grade socialite. The following are some facts about Facebook.

**Facebook.com average user figures and facts:**

- Average user has 130 friends on the site
- Average user sends 8 friend requests per month
- Average user spends an average of 15 hours and 33 minutes on Facebook per month
- Average user visits the site 40 times per month
- Average user spends 23 minutes (23:20 to be precise) on each visit
- Average user is connected to 80 community pages, groups and events
- Average user creates 90 pieces of content each month
- 200 million people access Facebook via a mobile device each day
- More than 30 billion pieces of content are shared each day
- Users who access Facebook on mobile devices are twice as active on Facebook compared to non-mobile users
- Facebook generates a staggering 770 billion page views per month

(For more detailed facts, see [www.facebook.com](http://www.facebook.com) or [www.pingdom.com](http://www.pingdom.com).)

**Step Five: Explore Twitter.** Twitter ([http://twitter.com](http://twitter.com)) is a free social networking and micro-blogging service that enables users to exchange short updates of 140 characters or less. A downside is that some people may be intimidated by the user interface, but it doesn’t overshadow the fact that Twitter communicates in real time. Some experts argue that the “web is dead” and users are becoming more engaged with application use.

Concerning Twitter, there are more than a dozen applications being used with various devices. I personally use the Twidroyd application with an Evo mobile device. Real-time updates supply users with information, taking little more time than an equivalent human conversation (depending on hardware and provider and whether the interaction occurs via a mobile application or on the World Wide Web).
Summary

What did we learn? Having a professional web presence counts. More often than we realize, we are being Googled without our knowledge or consent. Making sure that you are engaged properly on the web is key to building a personal Internet identity or brand. Damage control concerning existing information is possible with tools like Google AdWords. Web users should be knowledgeable about the social networking sites they use and be proactive about information security. The information being provided to the web should be enough to clear up information inconsistencies but not enough to jeopardize your reputation – or anyone else’s, for that matter. Periodic searches should be conducted to make sure that the right information is available to the right people. After beginning the five steps to brand building, a conscious effort to maintain the newly created profile should become easier. Have fun and remember to be yourself in person and on the web.

Resources Mentioned in the Article


Managing Your Online Professional Identity
by Teresa D. Jones and Deborah E. Swain

EDITOR’S SUMMARY
Confusion around names and identity features can undermine professional standing, but it can be avoided by carefully managing one’s online personal and professional identity. It is advisable to routinely check hits on one’s name online to be sure desired information is not clouded by mistakes or misinformation or overshadowed by another with the same name. Professionals should create personal e-portfolios and tie them to LinkedIn and other appropriate social networking sites. Active participation on those sites helps boost search returns tied with one’s professional identity. Promotional websites such as Vizibility.com can be made more effective by adding keywords to highlight interests and achievements, while MyWebCareer.com evaluates one’s networking profile. By customizing privacy settings, one can limit access to personal information. Managing personal information takes time but is critical to be sure online information accurately represents your identity.

KEYWORDS
- personal information
- social web
- social networking
- knowledge management

Your professional web identity says a lot about you. But do you know what it is? How often do you Google your name to understand what your professional identity is? Since 2005, when 75% of search firms regularly used Google to investigate job candidates, that habit by potential employers has increased now to 90% [1]. So your name on the web is important. But is your information clear and accurate? What can you do to enhance searching and better control your identity? According to James Alexander, founder of Visibility.com, about 2000 people on LinkedIn share names with persons on the FBI’s most wanted list [1]. What can you do if this confusion is true for you? There are steps you can take to ensure that the real you stands out on the web.

When you want to improve your personal identity search, you can add keywords that are specific to your address or job such as title, work place, city or state. Then, you should do a quick evaluation from the point of view of the employers or collaborators you want to work with so that you can be sure to list what you found that they would like to read about you. Also, did you find anything you didn’t like about you? Date and summarize in a log your professional Internet identity. Make it a habit to check periodically and use different browsers to find as many web identities as may be out there for you. Setting aside a time once a month or quarterly to maintain this identity allows you to manage the information and control the knowledge about you [2]. We will give you tips below to change your identity.

Basic Tips for Managing Your Professional Online Identity
On each site you have a presence be sure to maintain a level of professionalism that emphasizes your skills and interests in a positive light. Correct any mistakes, such as spellings of emails and name variations on any...
site, especially on your employer or institution’s website [2]. Minor typos can prevent your being located or correctly identified.

For your basic personal identity, you may already be using social networking tools such as Facebook, MySpace, Flickr or Twitter. But for your professional identity set up a career-based social network page through tools such as LinkedIn. Also, consider creating an online portfolio. This step can be done by taking your resume and converting it into an electronic format, with links to publications, research papers, presentations and other samples of accomplishments. There are cost-free tools for creating an e-portfolio that do not include ad displays, for example, Pwworks, Google Sites and WordPress. Minimal fees are charged for maintaining more detailed sites. Then to be sure your portfolio is used and that you are found by searchers, add links to it from your social pages: LinkedIn, Facebook, MySpace, Flickr and Twitter. Finally, on all these social pages, develop a profile and update it periodically [2].

A special note about LinkedIn: As a social networking site for sharing career information and establishing a professional identity, LinkedIn has become very successful and preferred by many Internet users connecting with others in their profession. Check it and become active on that network by accepting invitations and monitoring what associates and colleagues are doing. Keeping active and current in LinkedIn will also help bring your professional profile and preferred identity to the top of searches on most search engines [3].

Additional Steps

There is more that you can do to affect results of web searches. For example, you can register on promotional websites such as www.vizibility.com. Vizibility.com supports tools that make it easier for people to find you online. You can provide specific keywords that highlight new degrees or trainings, list subject areas from recent publications or presentations and emphasize old or new research interests. For example, use the tools provided by Vizibility.com to help others find you on the web. Also, you can effectively use the “SearchMe” link button to lead people directly to your web identity by adding them to your resumes, business cards or email signatures [1]. This way, you are ensuring that when employers and other professionals search for you, they find the information you want them to find. Your professional, online existence is essential. In this technology-driven society, you are expected to maintain a professional online presence. Otherwise, you might run the risk of being overlooked or seen as not progressive enough [2].

Another option is to sign up for sites such as www.MyWebCareer.com. This website evaluates both your social and business networking profiles. MyWebCareer tools also review and critique your overall network presences and define your search engine footprint to generate a personalized career score. Changing the score and controlling your professional identity on the Internet are up to you.

Using social networking to your advantage and doing what is required for personal knowledge management can depend on you and the time you take for social networking. First, you can use LinkedIn and other social sites to network and build connections among others in your field of study or work. Just as you network by attending conferences or taking courses for professional development, you can network on the web. Someone may know of a grant, research project or job that would interest you and further your career. To keep in touch, you might add the URL link for your LinkedIn profile to your contact information on your curriculum vitae and online portfolio, thereby making you clearly available [3].

However, you also need to protect yourself and your connections. So first of all, customize your privacy settings. You never know if a friend or a friend of a friend could become one of your potential employers [2]. If you are on Facebook, where a new version of Facebook has been released, it is advisable to create a new list on Facebook for your professional friends. You should customize it so that professional friends and associates can only see what you want them to see. Mainly, you want to manage online knowledge about your professional self, so be sure your Facebook profile is private if you don’t want others browsing your personal updates, photos and non-business comments. Keep updating to polish and control that identity [3].

Summary

Knowledge is gained from doing activities. In this paper, we offer a few suggestions for real knowledge management of your online identity.
Organizing your social network connections to manage your professional online identity starts with searching and analysis, “Who am I online?” Next, you can build profiles and portfolios and then possibly code descriptors to enhance your brand on the web. No matter your profession, your web identity has become an important aspect of who you are. Managing personal information and knowledge about yourself is a never-ending task, but we think it can start at a simple level and be creative. Most of the tips and suggestions we provide here were shared during a workshop presentation at the 2011 ASIS&T Annual Meeting and are intended as hands-on activities as well as introductory information.

Resources Mentioned in the Article


Enabling Personal Knowledge Management with Collaborative and Semantic Technologies
by Denise A. D. Bedford

EDITOR’S SUMMARY
Personal knowledge management (PKM) has come to be a central and critical element in the spectrum of knowledge management. The context and control of knowledge management is shifting from global and organizational levels to communities and ultimately to individuals. In developing a model for managing personal intellectual capital, two basic issues stand out. First, we must attend to the broad context of the individual represented on social networks, collaborative environments and other channels. Second, individuals should assume ownership, active management and control over information about themselves by building a formal PKM profile. We can collect elements of our personal information, aided by semantic and knowledge technologies for discovery and normalization, to compile and manage as our own intellectual capital. Work in progress at Kent State University has highlighted important lessons in personal knowledge management, including the foundational role of semantics and the need for a standard definition for a personal data model.

KEYWORDS
personal information data models
knowledge management semantics
information resources management knowledge discovery

In this article knowledge management is seen from the personal perspective. It is about people, what they know, how they learn and how they innovate. In 2011, four trends are redefining our understanding of knowledge management and highlighting the importance of both strategic organizational and personal knowledge management (PKM). They are:
1. The shift from an industrial to a knowledge economy
2. The rapid development of semantic and knowledge technologies – covering both Web 2.0 and Web 3.0
3. The virtualization of work and the working environment
4. A fundamental shift from application-based, information-centric architectures and technologies to open and knowledge-centric architectures and technologies.

The shift from an industrial to a knowledge economy positions intellectual capital [1, 2, 3, 4, 5] as the central factor of economic growth and production. In a knowledge economy, knowledge powers transactions, production and consumption. In the knowledge economy, there are heightened incentives to create, share, mobilize and preserve all forms of knowledge. Open knowledge markets support knowledge transactions and allow knowledge producers and consumers to establish the value of knowledge based on a particular context. It is the individual person that engages in knowledge exchanges and transactions, learns, acquires new knowledge and validates or invalidates knowledge. The primary agents in a knowledge economy are the individuals who possess the intellectual capital.

The rapid development of semantic and knowledge technologies – including those that power Web 2.0 and Web 3.0 – is the second trend. Web 2.0 focuses on interaction, the engagement of people and communities. Web 2.0 provides the context in which knowledge transactions occur. Web 2.0...
supports unobtrusive capture of semi-tacit knowledge or knowledge that is
un-reviewed, serendipitous and closer to raw. The new collaborative and
social environments make it much easier to discover and capture all forms
of knowledge at an earlier point in the knowledge life cycle [6, 7].

According to Mills Davis [8], a high-profile advocate of the semantic web,
Web 3.0 is about semantics and semantic technologies. Semantic technologies
have the potential to expand the scale and scope of knowledge transactions.
Semantic and knowledge technologies enable us to capture and leverage more
knowledge at a faster pace and to leverage the capacity of machine-based
agents. Semantic and knowledge technologies provide the tools and opportunity
to encode human knowledge so that it is available to a broader population.

The third trend is the virtualization of the working environment and the
increasing popularity of remote working [9, 10]. People will work where
and when they want to work. Workers will do their work in an environment
that is designed for them. Workers will have personalized agents that find
information for them regardless of where it lives. The new virtual
environment supports dynamic people-to-people connections. It leverages
and builds upon the two previous trends to support collaboration and
facilitate the development of knowledge-centric cultures. Much of this new
work environment exists beyond any one institution’s information
management or information technology infrastructure. In this new virtual
working environment, knowledge must flow beyond the application in
which it was originally created or stored. Furthermore, knowledge is made
accessible to other environments and applications.

A fourth trend is a fundamental shift from traditional information
architectures and information management technologies to knowledge
architectures and knowledge management technologies [11]. The challenge
this trend presents is as profound and fundamental as the challenges
referenced above. Our current infrastructure is solidly grounded in the
information management technologies that were developed from the 1980s
through the early 2000s. These technologies served us well during those
decades but they represent a pre-semantic and pre-knowledge mindset where
information is packaged, stored and locked down, rather than a viewpoint in
which knowledge is dynamic, continuously evolving and free flowing.

Knowledge becomes a complex object. In this context, it is clear that people
are a knowledge object. Our challenge is to determine how to represent people
as knowledge objects and to understand how their knowledge may be managed,
maintained, accessed, mobilized, exposed for consumption and protected.

The Traditional and the Future Focus of Knowledge
Management

Over the past 20 years, we have made significant advances in our
understanding of the theory and practice of knowledge management.
Traditionally, we began by looking at knowledge management from a world
level, at the levels of national economies. In the past decade we have expanded
our understanding of community and group knowledge. Today, forces such as
the focus on intellectual capital, the virtualization of the working environment,
semantic technologies and the shift to knowledge architectures focus our
attention and efforts on personal knowledge – at the individual level.

Two Fundamental Questions

This shift raises two fundamental questions. Both questions can be
simply stated but they have profound implications. Question one: If people
are the primary source of knowledge in 2010, what is the fundamental
representation of an individual’s knowledge? What constitutes metadata and
meta-information about people? The information science discipline offers
decades of experience and advice on metadata and bibliographic profiles for
information objects and information packages. Can that experience be applied
to defining descriptive representations of people as knowledge objects? To
answer this question, we need to understand all of the dimensions of a person
as a knowledge object. In order to operate in the new working environment
described above, we need people profiles that are similar to but more
extensible and flexible than metadata profiles for books or reports. People
are more complex than books and reports.

The second question arises from the first: If there is a universal people
profile and data model, who owns it, where does it live and how do we
maintain it? The issue is that entities other than the individual will create
and promote information about the individual. The four trends discussed
earlier make it easier to access information about an individual and to create an image for an individual. While there is little we can do to stop these trends, we can create a counterbalance. The counterbalance involves helping individuals take responsibility for their own profile and identity and their own knowledge representation and to manage that representation in the four contexts (see Figure 1). Individuals need to understand how to create a personal knowledge profile and how to actively manage it so that what is accessible is appropriate to the context.

**Question Two: Raising Awareness of Context**

Reversing the order of the questions for the moment, let’s assume that we have a universal people profile. Who creates the data that fills this profile? Where does it live? Who owns it? How is it maintained? And who can access it? To answer this question, we need to understand the context in which we would be using people profiles and data models. The answer depends on whether you are in a closed personal space, a community space, an organizational space or an open world environment. We suggest that the knowledge contexts identified in Figure 2 can help us to define our behaviors, set our expectations for management and access and better understand what is expected of the governance model.

The individual space is accessible to and governed by a person. In this space we would expect to be able to represent all facets of our intellectual capital. We would also expect to be able to determine who can see which facets and under what conditions. In the future, the extended capabilities that are available in the individual space will be protected and firewalled just as an organization is firewalled today. Today the capability to create a profile that represents all of our knowledge, all of our intellectual assets, does not exist. The data that would comprise this representation is scattered across applications that we do not control. Such capabilities are not only possible but are also inevitable, given the four trends discussed earlier. The critical question, as Dede [12] suggests, is this: Can we create a counterbalance that puts control and ownership of an individual knowledge representation in the hands of the individual? This is the challenge for the next 10 years.

The community context exists today in the form of collaborative environments, social networks, community spaces and all forms of communication channels. The community context provides rich opportunities for an individual to represent them – to express ideas, thought and raw knowledge. This context allows us to capture those ideas and raw knowledge in a persistent way. What we now express in a social context is publicly and persistently accessible. In this context, we expect to engage in shared
transactions. We understand implicitly that we share control with the others who are part of that community, as well as whoever owns the platform in which those transactions are taking place. The governance rules and protocols are generally known and in many cases may be defined by the members of the community. We understand what should be shared and what shouldn’t be shared in this space. We don’t make all of our intellectual capital assets available in this context.

The organizational context is similar to the community context in that we expect shared transactions. We also expect more formal organizational controls and less opportunity for individuals to represent themselves in ways that are not sanctioned by the organizations.

Third party transactions make up the world context. While we may be participants in those transactions, how we are represented is largely controlled by others. Our ability to influence or counterbalance those representations is limited.

Question One: Representing the Intellectual Capital of an Individual

Returning to Question 1, we observe that today, the need for individuals to be aware of and manage their own intellectual capital and to control their own knowledge representation aligns with an organizational need to manage intellectual capital assets. Over the past six decades, knowledge management theory and practice have come to understand that the individual is the primary source of knowledge. Organizations must strategically manage and value their knowledge and intellectual assets just as they value their financial and physical assets. Organizations need to ensure that their intellectual capital assets grow, are mobilized and leveraged to create new economic growth. Ultimately, though, only an individual can invest in, grow and mobilize knowledge and create intellectual capital. What do we mean by intellectual capital? How do we gauge the intellectual capital of an individual? And what can we do to help individuals grow their intellectual capital?

A classic definition of intellectual capital provided by Daniel Andriessen [13], illustrated in Figure 3, places intellectual capital in the context of two other types of capital – tangible capital and financial capital. Tangible capital includes land, fixed resources, plants, equipment and those resources that were critical to both the agricultural and the industrial economies. Financial capital is self-explanatory – it was a critical factor of production and growth for the industrial economy. Intellectual capital, a key factor of the knowledge economy, is defined to include human capital, structural capital and relational capital. Human capital includes implicit knowledge, skills and attitude. Andriessen defines structural capital to include explicit, encoded knowledge, processes and procedural know-how, and all forms of culture, including organizational, personal and national. Relational capital includes reputational knowledge and relational knowledge such as an individual’s networks, social relationships and business relationships.

Over the past 60 years, we shifted our perspective from a national accounting perspective to an individual worker perspective. In 2011, we need to translate this high level definition of intellectual capital management to a personal knowledge management (PKM) space. In 2011 it is important that we take this concrete step forward. The Kent State University IAKM (information architecture and knowledge management) program is launching a pilot test to determine what such a personal intellectual capital/knowledge management model would look like. Let’s consider what such a PKM conceptual model might resemble.
From Intellectual Capital to PKM

For the purpose of this discussion, we adopt a broad definition of PKM that includes the ideas expressed by Davenport [14], Frand and Hixson [15], Pauleen [16], Grundspenkis [17] and Wright [18]. Essentially, our conceptualization of PKM is as multi-faceted as the domain of knowledge management itself. PKM simply shifts the focus of key knowledge competencies from the strategic and organizational level to an individual level. PKM refers to the individual’s competencies in knowledge leadership, knowledge culture, collaboration and communities, knowledge asset management, personal knowledge architectures and personal learning. What does a PKM conceptual model look like?

We can begin with Andriessen’s intellectual capital model. Each facet of Andriessen’s model can be translated to a PKM characteristic. Figure 4 provides a high level representation of personal knowledge and intellectual capital facets. Each facet of Andriessen’s intellectual capital model can be translated into a rich set of PKM sources and indicators.

Designing a Dynamic Personal KM Profile

The PKM conceptual model provides us with a framework for designing a PKM profile. A PKM profile can be operationalized as a dashboard for an individual, who could then use it to monitor, manage and present their own intellectual capital.

The first step in constructing a PKM profile involves a formal translation of the intellectual capital facets of Andriessen’s model into personal knowledge behaviors and characteristics. A possible translation of human capital factors to PKM attributes is illustrated in Figure 5. A possible translation of structural capital to PKM is illustrated in Figure 6.

The second step in building a PKM profile is data collection and evidence discovery – finding the critical sources and examples of personal knowledge to use to build the profile. Figure 7 provides examples of sources of evidence
that might support the capture of PKM indicators. As we can see from some of the translation examples in Figure 7, such data collection is not a trivial task. Prior to the advent of Web 2.0 and the availability of collaborative and social media, this task would have been daunting to undertake once and almost impossible to consider maintaining on a continuous basis. However, with the availability and use of Web 2.0 technologies, finding and accessing these sources of data and evidence is possible.

The purpose of defining PKM profiles is to provide individuals with the capability to monitor their own intellectual capital creation, growth and use and to publish PKM profiles to their communities, their organizations and to the broader world. Operationalizing a personal management profile can be a labor-intensive and subjective undertaking. In order to operationalize the PKM profile, we need to leverage semantic and knowledge technologies – Web 3.0 capabilities.

At this stage we encounter two major challenges: (1) the varied form and nature of the evidence and its scatter across many applications and (2) the inherently subjective nature of some of our proposed indicators. For example, let’s consider how we would define indicators of an individual’s procedural knowledge. An individual might want to include in her profile the performance appraisal feedback she had received. Such feedback is generally embedded in other applications and wrapped in security. From organizational unit to organizational unit and across organizations the form in which this information is captured may vary widely. And, by definition, the performance appraisal feedback is subjective – provided by individuals and interpreted by individuals. A second example of procedural knowledge might consist of business decisions that an individual has made or ways of doing business that a person has defined. Again, this information may be embedded in business applications as business rules in an enterprise resource management application. A third example of procedural knowledge may be business

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**FIGURE 6. Translation of structural capital attributes to PKM characteristics**

<table>
<thead>
<tr>
<th>Structural Capital</th>
<th>Intellectual Capital Attribute</th>
<th>Personal Knowledge Management Translation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procedural Intelligence</td>
<td>Procedure language</td>
<td>Activity reports</td>
</tr>
<tr>
<td></td>
<td>Performance evaluations</td>
<td>Business-function classification of language and writing</td>
</tr>
<tr>
<td></td>
<td>Application orientation of language and writing</td>
<td>Job descriptions of positions held</td>
</tr>
<tr>
<td></td>
<td>Business process specific training</td>
<td>Term of reference</td>
</tr>
<tr>
<td></td>
<td>Committees or team roles and responsibilities</td>
<td></td>
</tr>
</tbody>
</table>

**FIGURE 7. Alignment of intellectual capital factors, indicators and sources of evidence operationalizing the PKM model**

<table>
<thead>
<tr>
<th>Intellectual Capital Factor</th>
<th>Personal Knowledge Management Indicators (As evidenced by...)</th>
<th>Sources of Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human Capital</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Culture</td>
<td>• Opportunity seeking language</td>
<td>• Email conversations</td>
</tr>
<tr>
<td></td>
<td>• Problem surfacing and characterization</td>
<td>• Social networking conversations</td>
</tr>
<tr>
<td></td>
<td>• Risk preferring or aversionism in language</td>
<td>• Correspondence</td>
</tr>
<tr>
<td></td>
<td>• Normative language vs. rule adherence</td>
<td>• Membership in organizational clubs</td>
</tr>
<tr>
<td></td>
<td>• Level of participation in organizational activities</td>
<td>• Involvement in group activities</td>
</tr>
<tr>
<td></td>
<td>• Level of participation in professional domains</td>
<td>• Organizational committee assignments</td>
</tr>
<tr>
<td></td>
<td>• Level of community or social involvement</td>
<td>• Professional community memberships</td>
</tr>
<tr>
<td></td>
<td>• Favor or acknowledgement of others actions</td>
<td>• Professional committee assignments</td>
</tr>
<tr>
<td>Attitude</td>
<td>• Professional tone of conversations</td>
<td>• Any correspondence or dialog instances</td>
</tr>
<tr>
<td></td>
<td>• Learning attitude in discourse</td>
<td>• Any documentation produced by individual – internal or external to the organization</td>
</tr>
<tr>
<td></td>
<td>• Work attitude demonstrated</td>
<td>• Learning relationships with others – bidirectional</td>
</tr>
<tr>
<td></td>
<td>• Use of collaborative language in discourse</td>
<td>• Levels of activities reported</td>
</tr>
<tr>
<td></td>
<td>• Mentoring relationships</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Mentee relationships</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Engagement in professional activities</td>
<td></td>
</tr>
</tbody>
</table>
process knowledge that an individual has created as part of fulfilling his work obligations – it may be represented as unstructured business documents that are linked to a business process or even represented as business knowledge in an email communication. Discovering this evidence will be challenging and, again, interpreting it may be subjective.

Semantic and knowledge technologies such as those referenced earlier in Mills Davis’ roadmap [8] provide the tools that allow us to discover evidence and to interpret it in order to develop PKM profiles. For example, sophisticated semantic technologies, when configured with relevant language and characterization about business processes, can assist us in discovering and interpreting evidence across applications. Interpretation of evidence as indicators can also be achieved using semantic analysis technologies where the technologies have strong natural language processing foundations and where there is a capability to engineer human knowledge into the application.

Sample Use Case

Let’s take as a use case the interpretation of business decisions or business communication as an indicator of procedural knowledge. Let’s assume that we have examples of business tasks and decisions represented as decision explanations in business forms or as narrative in email communications. Our goal is to interpret this feedback to determine something about the nature and depth of the individual’s procedural knowledge. Let’s also assume that we have a sophisticated semantic analysis technology to work with.

Our first step will be to determine what is important to us in terms of business knowledge – what is the nature of the language used? How complex is this language? How pertinent is the knowledge this person has expressed to the technical competencies we expect for this business task? Is there an indication of growth or learning in these competencies over time? Is the language used sufficiently expressive that others might learn from reading it? All of these parameters can be characterized through knowledge engineering methods and encoded as conceptual rules and parameters in semantic analysis technologies.

The next step is then to select a sample set of individuals for pilot testing. The pilot test should take place over two years, beginning in Fall 2011. The sample set is being identified at this time. Individuals who are interested in participating or who would like to recommend others for participation or profiling are encouraged to contact the project team.

Observations and Lessons Learned

We have been exploring these issues for just one short year now. Our early exploration, though, suggests that it is possible to configure and design semantic applications that will support the construction of PKM profiles. As with all early stages of new applications, however, the scale and scope of development is not yet cost effective. Those areas of the profile that are specific to structural capital in particular – where the embedded knowledge is closely aligned with a particular business domain or a way of working at an organization – may require targeted design and development. Nonetheless, other areas of the profile such as those aligned with human capital or relational capital may have a broader, cross-organization and cross-sector appeal.

We have learned several lessons in exploring these ideas over the past year. A central lesson is that the most important knowledge for building semantic profiles to support PKM is not knowledge of the technologies but rather the semantics of business and procedural knowledge. Constructing a semantic application that is intended to profile procedural knowledge must be grounded on the semantics of procedural knowledge. Similarly a semantic application that would profile narrative intelligence must be grounded on the semantics of narrative intelligence.

A second key lesson learned is that the core component of a PKM foundation is lacking – a standard definition for a people data-model. The expanded focus of knowledge management in the 21st century to include people and knowledge itself will require that we fill this gap. At this point in time, the only instance we found of even the beginning of a standard people data-model was in fact in social media applications. It is important for knowledge professionals to become more involved in the definition, description and standardization of people data-models and profiles.

A third key lesson is that while the intellectual capital models provide a strong foundation for representing an individual, they are not complete. Individuals possess other assets that should be included in a universal people profile.
A fourth key lesson learned is that semantic technologies that support the configuration and embedding of human knowledge or knowledge organization systems are likely to be the most productive for supporting this effort. While the semantic technology market is vibrant and rich with tools, there are some key components that appear to be more productive for this type of knowledge-management-focused work than others.

Resources Mentioned in the Article


Awareness of Context and Privacy
by Sabah Al-Fedaghi

EDITOR’S SUMMARY
Adding contextual information enhances the content and value of communications, yet it can also introduce risk and threaten privacy. A common piece of contextual information is location, but context extends to identity, user profile, e-mail address, time and more. Understanding context from the standpoint of privacy awareness requires a systematic conceptualization of the concepts of privacy and context, personally identifiable information and the ways information flows, from processing and creation through transfer and acceptance. Numerous examples illustrate the potential chain of connections that could be revealed between a personal subject and context. Such information, made explicit, can undermine privacy policies. Integrating context- and location-aware services in software should be approached cautiously and with full understanding of the implications. Diagrammed scenarios provided can inform considerations and software specification building.

KEYWORDS
contextual information
privacy
personal information
location based services
software engineering
information flow

Context awareness refers to linking changes in the environment with systems. Context is an important factor in improving computer-human communication. In ubiquitous computing, users work in a more dynamic context, and they can access services in a wide range of possible situations. A better understanding of context will help application designers determine which context-aware behaviors to support in their applications.

After reviewing many definitions of context, Dey et al. proposed the following definition:

Context is any information that can be used to characterize the situation of an entity. An entity is a person, place or object that is considered relevant to the interaction between a user and an application, including the user and applications themselves. [Italics added] [1, Section 2.2]

According to Drost,

This definition is not really consistent, because context is not information. From the broadest view possible, context is anything that could improve or influence the behavior of the application according to the environment in which the user operates. However [this] definition is one of the most widely used. [2, p. 4]

In context-aware applications, context information is input when delivering a service. This information can be segregated into categories. A categorization of context types helps application designers uncover the pieces of context that will most likely be useful in their applications. Many such categorizations have been proposed. Ryan et al. [3] segregate primary context types into four categories: location, environment, identity and time.

Dey et al. replace environment with activities, since environment “is a synonym for context and does not add to our investigation of context. Activity, on the other hand, answers a fundamental question of what is
occurring in the situation” [1, Section 2.3]. From primary context we can find secondary context (for example, identity may lead to e-mail address, birthdate, friends and location, which may lead in turn to other people in the same location and activities occurring nearby). Again, according to Dey et al.,

This characterization helps designers choose context to use in their applications, structure the context they use and search out other relevant context. The four primary pieces of context indicate the types of information necessary for characterizing a situation[,] and their use as indices provide[s] a way for the context to be used and organized. [1, Section 2.3]

In this paper we concentrate on studying the notion of context in the area of privacy. According to Tatli [4], “Considering the risks, the users should be in the position to control their location privacy. Even though location is the most used context, there are other context data that increase functionality.” He notes that previous works on context privacy consider a small subset of context like location, date and time, while Drost notes that “There have been various investigations on privacy in context aware systems, but many address only one threat in the field of privacy or they regard only one type of contextual information” [2, p. 2]. Topics discussed in these works include separating location and identity [5] and applying privacy rules to applications [6].

Schmidt et al. [7] proposed a context data model (Figure 1) for context data stemming from the user himself and his surroundings. Tatli [4] enhanced Schmidt et al.’s model with two categories: protected context and evaluated context. Protected context includes user identity, user profile, physical conditions and location. Evaluated context includes user morale, infrastructure, social environment, user tasks and time. According to Tatli,

The context data in the protected context group are distributed to other principals in order to increase the functionality and therefore require privacy protection. Any context data in this group can get benefit of blurring. The context data in the evaluated context group are not sent to other principals, but affect user’s privacy concerns and therefore are used to evaluate the privacy of the context data. [Italics added] [4, Section 4]

The resultant privacy dependence of context data in this privacy-aware model is illustrated in Figure 2.

This review of these models is not meant to be fair and complete; rather it is intended to give a flavor of some approaches that conceptualize a privacy-aware context. In this paper, rather than proposing yet another enhancement of these models, we elect to develop an entirely different approach since these models of privacy-aware context do not provide a systematic conceptualization of the notions of context and privacy. As further preparation, the next section scrutinizes the underlying concepts utilized in these models.

Underlying Concepts in Context-Aware Models

As mentioned previously, in context-aware applications, context is defined as “any information that can be used to characterize the situation of an entity” [1]. This raises the issue of the difference between information used to characterize the situation of an entity and information used to characterize the entity itself. A situation and context are sometimes defined in terms of each other, for example, a situation is “the context that a person or organization is operating within at a specific point in time” [8, n.p.].

The terms context and situation are widely used in different study areas.
In psychology, Harwood et al. [9] define “situation awareness” as having four components: where (spatial awareness), what (identity awareness), when (temporal awareness) and who (responsibility or automation awareness). Burke [10] conceptualized a situation as a scene (as in theatre) where agents enact behaviors (acts). Yet situation is mostly viewed as a dynamic or structure that initiates actions. It unfolds actions in a plot. In the area of context diagrams, “The 'context' of any situation is the external environment in which it exists... In process terms, the context contains other processes that provide inputs and outputs to and from the process in question” [11, n.p.].

Comparing these uses of context with “any information that can be used to characterize the situation of an entity” as defined by Dey, it appears that information about “the situation of an entity” is different from information about the entity (for example, user).

In this paper, we adopt a more systematic modeling methodology based on the notion of flow and apply it to context-aware systems. The examples given later will clarify this approach.

Interestingly, works on context privacy such as Tatli [6] do not define privacy or private information although Tatli mentions privacy-aware data. According to Drost [2], “[p]rivacy is hard to define because it differs from person to person. Therefore many definitions of privacy exist” [p. 5]. Nevertheless, he notes that informational privacy is the “most relevant when dealing with a context-aware system,” defined as “the right to know what is done with a person’s personal data and which personal data is being gathered” [p. 6].

In this paper we adopt a more objective definition of personal information and apply it to context-aware systems. Thus the next two sections are reviews of published works about privacy and flow-based modeling as a preface to using them to develop a systematic conceptualization of the notions of context and privacy.

Privacy

What is personal information (PI)? According to Cavoukian and Tapscott [12], PI can be defined in many ways, including

- any information associated with or linked to an identifiable individual (for example, personal preferences, beliefs, opinions, habits, family and friends)
- information about an individual provided by third parties (credit reports).

While this description of personal information encompasses most meanings of PI, it mixes or does not clearly distinguish personal identifiable information (PII) from personal information that does not embed a person’s identity. Furthermore, it does not clarify how information is personal if it is about more than one identifiable person.

In the United States, the Personal Data Privacy and Security Act, S. 1332, 109th Cong., in Sec. 2, Findings, uses the terms personal identifiable information, identity, personally identifiable information and personal information. The term personally identifiable information is defined in Sec. 3, Definitions, to mean “any information, or compilation of information, in electronic or digital form serving as a means of identification, as defined by section 1028(d)(7) of title 18, United States Code” [13].

Different types of information pertinent to this paper are shown in Figure 3. So-called personal information is a type of information that includes PII and personal non-identifiable information (NII).

Personal non-identifiable information is called “personal” because its owner (a person) has an interest in keeping it private, even though it does not embed his or her identity. This information is owned by the person, as in the expression “personal belongings,” for example, a personal collection of research papers or songs.

From a security point of view, PII is more sensitive than an equal amount of NII (“equal amount” will be discussed later). With regard to policy, PII
has a more policy-oriented significance than NII (see, for example, EU Directive 95/46/EC [14]). With regard to technology, there are unique PII-related technologies such as the W3C Platform for Privacy Preferences Project (P3P) (www.w3.org/P3P/) and techniques such as k-anonymity (http://spdp.dti.unimi.it/papers/k-Anonymity.pdf) that revolve around PII. Additionally, PII possesses an objective definition (to be introduced later) that provides a means (identities of its proprietor) for separating it from other types of information, thus facilitating organization in a manner not available to other types of information.

PII involves special relationships with proprietors (persons about whom the information communicates something) that it does not have with non-proprietors (persons who have other persons’ PII) and non-persons such as institutions, agencies and companies. For example, a person may possess PII of another person, or a company may have the PII of someone in its database; however, proprietorship of PII is reserved only for its proprietor regardless of who possesses it.

From the informational perspective, the proprietor’s PII is the “person.” According to Floridi [14], my “personal information is a constitutive part of me-hood,” while the proprietor’s NII and “others’ (for example, friends’) PII” form his or her context.

Reference as a Base for defining PII. To base personal identifiable information on firmer ground, we turn to establishing some principles related to such information. For us, personal identifiable information is any information that has referent(s) to uniquely identifiable persons [16, 17]. In logic (correspondence theory), reference is the relation of a word (logical name) to a thing. Every PII refers to its proprietor(s) in the sense that it leads to him/her/them as distinguishable entities in the world. This reference is based on his/her/their unique identifier(s). The relationship between persons and their own PII is called proprietorship [16, 18].

A piece of information is PII if at least one of the objects to which it refers is a singly identifiable person. Any singly identifiable person in the PII is called a proprietor of that information. The proprietor is the person about whom the PII communicates information. If exactly one object exists of this type, the PII is atomic PII; if more than one singly identifiable person exists, it is compound PII. An atomic PII is a piece of information about a singly identifiable person. A compound PII is a piece of information about several singly identifiable persons.

Any compound PII is privacy reducible to a set of atomic PII. For example, John and Mary are in love can be privacy reducible to John and someone are in love and someone and Mary are in love.

Identifiers and PII. Consider the set of unique identifiers of persons. Ontologically, the Aristotelian entity/object is a single, specific existence (a particularity) in the world. For us, the identity of an entity is its natural descriptors such as tall, brown eyes, male or blood type A. These descriptors exist in the entity/object. Height and eye color, for example, exist as aspects of the existence of an entity. We recognize the human entity from its natural descriptors. Some descriptors form identifiers. A natural identifier is a set of natural descriptors that facilitates recognizing a person uniquely. Examples of identifiers include fingerprints, faces and DNA. No two persons have identical natural identifiers. An artificial descriptor is a descriptor mapped to a natural identifier. Attaching the number 123456 to a particular person is an example of an artificial descriptor in the sense that the number is not inherent to the (natural) person. An artificial identifier is a set of descriptors mapped to a natural identifier of a person. By implication, no two persons have identical artificial identifiers. If two persons somehow have the same Social Security number, then this Social Security number is not an artificial identifier because it is not mapped (does not refer) uniquely to a natural identifier.

A basic principle in this definition of PII is as follows: Identifiers of proprietors are PII. Such definition is reasonable since the mere act of identifying a proprietor is a reference to a unique entity in the information sphere. Every unique identifier of a person is a basic PII in the sense that this identifier cannot be decomposed into more basic PII.

The second principle defines PII in general: Any personal identifier or piece of information that embeds identifiers is personal identifiable information.

Thus, identifiers are the basic PII that cannot be decomposed into more basic PII. Furthermore, every complex PII includes in its structure at least
one basic identifier. Note that the concern here is not issues of flexibility or narrowness of PII definitions, which is a matter that can be settled after developing a precise definition that encompasses all types of PII. For example, the USA Personal Data Privacy and Security Act (Text of S. 1332, 2005 [19]) limits PII by introducing the notion of sensitive PII.

PII and Non-PII. Consider the PII Alice visited clinic Y. It is PII because it represents a relationship, that of the proprietor Alice with an object, the clinic. Information about the clinic is contextual information about Alice. It may or may not be privacy-related information. For example, year of opening, number of beds and other information about the clinic is not privacy related. Thus, such information about the clinic is not related to Alice’s PII; however, when the information is that the clinic is an abortion clinic, then Alice’s PII is related to this non-identifiable information about the clinic. That is, the statements \{Alice visited clinic Y, Clinic Y is an abortion clinic\} give Clinic Y is an abortion clinic privacy-related significance. Thus contextual information may have privacy significance.

Flow Systems

In this section we turn to the types of actions that can be performed on information including PII. While such operations as collecting, accessing, transmitting, using, storing or processing have been mentioned in many studies about information, a systematic framework for relating such operations in an organized manner has never been developed. According to Al-Fedaghi [19], information is a flowthing. A flowthing refers to types of things that flow, hence, are processed, created, released, transferred, arrive and are accepted. Figure 4 is a state transition diagram of information flow showing six states of information.

A flowthing model (FM) is
- a flow system (flowsystem) that represents stages and
- things that “flow.” The flowsystem is a state diagram that includes
  - six (and only six) states (also called stages) of information: processed, created, released, transferred, arrived and accepted, with possible substates.
  - flows among these states represented by solid arrows
  - triggers that activate a different flow, represented by dashed arrows, as will be described later.

A process in FM is any operation that does not produce new flowthings. For the sake of simplicity, when appropriate, we will merge the arrival and acceptance stages into one stage called receive.

Proprietor and Context

Since privacy, according to our approach, is the informational privacy of an individual person (the proprietor, say, Bob), then the (informational) context of this proprietor is as shown in Figure 5. Thus, context information (CI) is all information that is related to the proprietor, excluding his or her own PII. Notice that CI may include PII of others in the context of the proprietor.

Nevertheless, in terms of flowsystems, Figure 5 can be viewed as information flowsystems. Suppose that the context of proprietor Bob includes one person (say, Alice) and a computer. This can be conceptualized as shown in Figure 6.

Suppose that awareness of Alice’s actions in Bob’s context is somehow
Examples

Blount et al. [20] analyzed the task of satisfying preferences for exposing context data to authorized applications and individuals. They developed a role-based, context-dependent privacy model for enterprise domains. An example of privacy policy is as follows:

President (subject) grants (releases) information to White House staff (requester) about his location when both the president and the requester are in the White House (context).

<table>
<thead>
<tr>
<th>Requester</th>
<th>President</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>President.dept</td>
</tr>
<tr>
<td>Context</td>
<td>$subject.location=whitehouse AND $requester.location=whitehouse</td>
</tr>
<tr>
<td>Information</td>
<td>whitehouse</td>
</tr>
<tr>
<td>Release</td>
<td>Grant</td>
</tr>
</tbody>
</table>

In this case, a context-dependent policy database is constructed, as shown in Table 1.

The flow model representation for this example is shown in Figure 8. The requester creates (circle 1) a request that flows to the president. It is received (circle 2), but its processing is blocked until triggered by the White House. The White House records the arrival (receiving) of persons, and it initiates
triggering only if the requester and the president are received (in the White House). The context is represented explicitly: the requester and the White House. Conceptually, the White House is an entity like the requester and the president.

In comparison, Table 1 is a shorthand notation that embeds ambiguity. For example, there is nothing saying that the request is directed to the president (implicitly it is assumed that the receiver is the subject). The textual description complements the table. Suppose that only the table is available to the designer. He or she can interpret the table to mean that the request goes to an employee (for example, the president’s secretary). The semantics of “context” in Table 1 are also troublesome. Who is keeping track of whether the requester and the president are in the White House? “White House” in Figure 8 explicitly expresses that an entity (for example, the security unit) is responsible for that.

Flow conceptualization represents a complete description characterized by contiguity of the privacy policy.

As another example, consider Kjærgaard et al.’s [21] modeling of complex and interwoven sets of context-information “by extending ambient calculus with new constructs and capabilities” [21, p. 1]. They give the following scenario, where a query for information is issued, and the response is adopted based on current context. The scenario is summarized in the following description in terms of the Aware-Phone application:

A ... nurse needs to contact a more experienced doctor to consult him on some issue. So the Aware-Phone is queried for where the nearest doctor which is not occupied by some other work task is located. The application then returns the best suited doctor in the current context of the location and activities of the doctors on duty. [21, p.4]

The example scenario is described using textual syntax as follows (illustrated in Figure 9):

Entity: [Awarephones[#AP1 | #AP2] ]
Person: [Doctor[#AP1] | Nurse[#AP2] ]
Status: [Busy[#AP2] | NotBusy[#AP1] ]
Location: [Hospital | Ward1[#AP1 | #AP2] | Ward2[ ] ]

Figure 9 exhibits fragmented representation when compared with the flow-based conceptualization shown in Figure 10, where there are spheres for nurse, doctor, Ward 1, Ward 2 and AwarePhone, which is the querying system that receives information about doctors and responds to nurses’ queries.

The nurse has three flowsystems: location information, status information and queries. First she creates a query (circle 1) and sends it to the query flowsystem in AwarePhone. The query is processed and triggers a flow of response (circles 9 and 10) in the location and status information flowsystems, and the response is transferred to the nurse (circles 11 and 12).

The doctor’s sphere includes tasks and physical (body) flowsystems. As indicated by the arrow at circle 3, the doctor receives tasks from somewhere.
Here there is ambiguity about the flow of these tasks that make the doctor busy or not busy. For example, is there a system that records a doctor’s medical sessions (e.g., start and finish times)? In Figure 10, tasks trigger (circle 4) the AwarePhone to create information about the doctor’s status. Similarly, the doctor’s physical flow system releases (circle 5) the (physical) doctor to Ward 1 (circle 6) and Ward 2 (circle 7). Notice that it is logical to add movement of the doctor between the two wards and outside. Note the convenience of the Release stage in representing such a situation as the doctor goes from Ward 1 to Ward 2; however, he waits for the transportation carrier between wards.

The presence of a doctor on a ward triggers creation of location information in AwarePhone (circle 8). Status and location information are stored and retrieved after being triggered by the query flow system (circles 9 and 10).

This flow-based representation is analogous to a story or plot in a comic book, where flow of events is continuous and without gaps, similar to, for example, accomplishing tasks, going outside or between wards.

**Conclusion**

Thanks to a number of high-profile platforms and use cases, context- and location-aware services are now familiar concepts to consumers and developers. However, understanding of the potential risks and data protection implications has lagged behind. In this article, we have worked through a series of practical examples and demonstrated that a high-level, abstracted approach to conceptualizing knowledge awareness context/privacy systems is a useful component in reasoning about the sensitivity of personal information. Given the very real importance of the theme of data privacy in our everyday lives today, we suggest that this form of analysis can serve as a useful engineering technique, supporting the development of an initial software specification, and would be particularly applicable at the requirement phase of building context-aware and privacy-aware systems.

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**Resources Mentioned in the Article**


Continued on next page
Knowledge Management of Social Networks

AL-FEDAGHI, continued

Resources Mentioned in the Article, continued


Twitter, Information Sharing and the London Riots?
by Emma Tonkin, Heather D. Pfeiffer and Greg Tourte

EDITOR’S SUMMARY
The prolific commentary disseminated via Twitter on the riots in London and other British cities in August 2011 has given rise to the question of whether their reflection in such social media forums may have added to the unrest. Investigators analyzed 600,000 tweets and retweets about the riots for evidence that Twitter was used as a central organizational tool to promote illegal group action. Results indicated that irrelevant tweets died out and that Twitter users retweeted to show support for their beliefs in others’ commentaries. Tweets offered by well-known and popular individuals were more likely to be retweeted. In the case of the British riots, there is little overevidence that Twitter was used to promote illegal activities at the time, though it was useful for spreading word about subsequent events.

KEYWORDS
Twitter, computer-mediated communications
social networking, sociocultural aspects
social web

The recent riots in London and other cities in England have inspired a great deal of interest in the role of social media in incitement, organization and analysis of events. Initial reactions to the events saw many commentators laying blame upon social networks such as Twitter, suggesting that networks are being used to incite social unrest and that their absence would reduce the likelihood of ongoing unrest.

The microblogging tool Twitter has become a popular service, widely used worldwide. Its popularity has grown rapidly in the United Kingdom, where the traditional media have recently begun to use it both as a source for information and as a dissemination platform. From its beginning, it has been the subject matter of occasional BBC news items; for example, the BBC now refer to Twitter regularly as a news source (see Figure 1). It is possible to see a cyclic element in the relationship between Twitter and the national UK media. On the one hand the traditional media are driven by various factors, including events, existing discourse and public opinion (as represented by Twitter among others sources). On the other, as the service becomes entrenched in journalistic practice, some perceive the flip side of the coin, that Twitter content is driven by traditional media and traditional journalism – thus the potential cyclic element.

As well as functioning as a forum for comments and discussion, Twitter also provides the retweet mechanism; relaying another individual’s tweet through one’s own account and to one’s own followers is “the key mechanism
for information diffusion in Twitter” [1]. Boyd et al. [2] suggest that retweeting is part of a complex conversational ecology – more visible Twitter participants “retweet others and look to be retweeted” – and is a means of participating in a “diffuse conversation.” The frequency of repetition of a message does not imply accuracy; indeed, Boyd et al. [2] describe a case in which an inaccurate story received frequent retweets, while a published correction of the story did not.

What does it mean to retweet a message without introducing one’s own interpretation – repeating someone else’s tweet “with a straight face”? Twitter participants frequently provide a short preface to retweeted messages. A few examples of this sort of usage include:

- One or more exclamation marks, such as: ‘!’ or ‘!!’, apparently conveying shock or raised-eyebrow surprise
- “<3”, an ASCII heart symbol recalling the omnipresent “I <3” t-shirt/bumper sticker slogan
- Brief textual comments such as “Anyone?” “Best yet:” “Couldn’t agree more”

In this way, the retweeter is able to say, “I read this – and I would like to indicate the extent to which I agree/disagree.” Under some circumstances, it seems, Twitter can operate as an echo chamber for rumor/gossip. As we will see in this article, it can also serve as a stage for humor or drama, and it can help to amplify humanitarian impulses. There is a temptation to see retweets as a “dramatic performance” [3], a sort of digital grandstanding before one’s friends and acquaintances; yet to adopt this description wholesale would be to trivialize a very real interaction.

It is useful to note the context in which the tweet is placed by the author. Terms starting with a #, or hash symbol, known as #hashtags, are treated specially by Twitter, enabling streams of tweets containing the same #hashtag to be read in sequential order by any user. This device is often used to create the effect of a topical chatroom dedicated to the subject of that #hashtag. Examples include essentially innocuous activities like games, such as #oneletteroffmovietitles (movie titles with one altered letter, radically changing their meaning) – for example, The Empire Strikes Jack, The Incredible Sulk and so forth.

New performance #hashtags appear often, and it is common for them to play on issues currently popular in traditional media. For example, the discovery that a journalist for the UK’s Independent newspaper had created partially fabricated interviews based on material lifted from elsewhere led to the appearance of a #hashtag, #interviewsbyhari, containing brief extracts generated using the same methodology. Any number of individuals may perform freely on this impromptu #hashtag stage. One @RichardLucas3, for example, contributed, “Shakespeare sharpened his quill, turned to me, and enquired, ‘Shall I compare thee to a summer’s day?’ #interviewsbyhari.”

Another, @betapolitics, proposed, “As Neil Armstrong came bounding over to me he said: ‘One small step for man, one giant leap for mankind’ #Haregate #interviewsByHari.” These examples demonstrate a further characteristic of #hashtags. More than one may be referenced within a single tweet. The practical limitation is the character count limit of Twitter, which penalizes excessive #hashtag use. It is not, however, uncommon for two #hashtags to be in use simultaneously for a period of time.

In general users on Twitter only see the content posted by friends – in other words, information from approved sources. Hashtags provide an exception to this rule: as Twitter users watch a #hashtag stream, they will see tweets from anywhere in the network. However, these tags are by default filtered by Twitter to show only top tweets, so the user must actively request an unfiltered view of the #hashtag stream.

**Link Sharing.** Previous studies suggest that the majority of retweets contain links [4], a far larger proportion than is representative of original tweets. Two popular types of content retweeted are links to social media content sites such as Flickr, yfrog, FaceBook or YouTube and links to web-based content sourced from traditional media institutions such as online newspaper articles.

The extent to which discourse on general social media and on Twitter, in particular, is driven by individual initiative or emerging consensus versus broader dissemination through traditional media is an open question. Zhao and Jiang [5] performed an empirical study comparing content coverage on
Twitter with that of the *New York Times* (NYT) on a total of 96 million tweets, which they compared against approximately 12,000 contemporaneous news articles crawled from the NYT. The topics of each were identified in a semi-automated manner, loosely categorized into event-oriented, entity-oriented and long-standing topics. Their findings unsurprisingly confirm that event-oriented topics constitute a larger proportion of NYT than they do for Twitter. But they also found that event-oriented topics are more actively spread through retweeting, particularly when significant world news such as natural disasters was the topic. Zhao and Jiang concluded that Twitter users are more likely to spread world news than other types of information.

**Social Networks and the Flash Mob.** Social media, in general, and Twitter, in particular, have long been associated with spontaneously arising behavior such as the flash mob. The term *flash mob* applies to a decentralized group activity that typically has a performance aspect; for example, spontaneous group outbursts of dancing; a crowd converging on a public space to stand in motionless silence for a predefined time before moving on as though nothing had happened; or light-saber battles in a shopping center. Gore [6] traces the history of the flash mob to precursors in the 1960s and identifies as well similar concepts such as science-fiction author Larry Niven’s “flash crowd.” She describes it as a concept in flux, moving away from an initial definition as “pointless” performance activity or “gratuitous acts of fun” to become associated instead with “celebration, political activism and/or commercial advertisement” [6, pp.126-127]. Nonetheless, the unthreatening organized spontaneity of the flash mob is a benign form of “swarming,” which is defined by White as “the unexpected gathering of large numbers of people in particular public locales” [7, p. 321]. Flash mobs usually depend on the same technical communication links that are said to facilitate more sinister applications, such as organized gate-crashing and, indeed, riots.

**The London Riots.** During the week of August 6, 2011, a series of riots occurred in England. The point of origin of the disturbance was Tottenham (in the greater London area), following a fatal shooting that occurred with unclear circumstances. This death sparked a peaceful protest. However, rioting began shortly thereafter and spread through London, nearby towns and cities and eventually to several of England’s larger cities, including Birmingham, Nottingham, Leicester, Wolverhampton, Liverpool, Manchester, Bristol and others. During this time period, 3,443 crimes related to the riots were recorded across London. Over a thousand people were charged as a result. The sentences handed out divided public opinion, with some seeing the penalties as unusually severe and others describing them as too light. It is clear that the impact of these events on Twitter users provides only a partial accounting of them. Nonetheless, here we will present the events from the Twitter perspective, but as with any social medium it is important to note the limitations of the source.

As examples, here are some notable events or movements:

- **Vigilante groups formed.** A notable example: a group of Millwall Football Club supporters, themselves typically associated in the media with hooliganism, controversially took to the streets as vigilantes.

- **Large groups of volunteers offer to clean up the damage.** Arriving at various locations armed with cleaning materials. Various appellations were used for these efforts; following the widespread distribution of an image showing a crowd carrying brooms, many used the term *broom army*. Another popular term, and hence #hashtag, was #riotwombles (#wombles), a nostalgic term that represented the Wombles, which are characters in a cult-classic BBC television series, itself based on a set of children’s novels. They are a species of furry characters who live under Wimledon Common in London and occupy themselves by cleaning the common of rubbish, which they then recycle for their own purposes.

- **The hashtag #OperationCupOfTea,** which called for participants to “stay in and drink tea” (that is, establish a self-imposed curfew). An alternative interpretation related to another symbolic image: a police officer using an upturned riot shield as a tea tray.

- **Campaigns were set up to help individuals particularly affected by events.** Several such initiatives raised around £30,000 ($45,000) each for people including 89-year-old barber Aaron Biber and shopkeeper Siva Kandiah to pay for repairs to commercial premises and contents. Perhaps
the highest-profile case was that of the #somethingniceforashraf appeal for Ashraf Haziq, a Malaysian student who, having been injured, was then robbed by a group of youths under the guise of rescuing him.

It is perhaps relevant to note that during the London riots, two men were given four-year jail sentences for inciting to riot by creating Facebook pages or Facebook events, although in neither case did anyone turn up for them [8] a fact attributed by some to preventative action by the police. As others have found in less extreme circumstances, the use of social media as an organizational tool does not necessarily lead to a demonstrable result. Any flash mob event, even the most harmless, may sound compelling online, perhaps even receiving considerable attention on Facebook or other sources. Flash mobs may fail for any of several reasons ranging from lack of interest, to poor timing, coming to the attention of the authorities – thus discouraging potential participants – or an intimidating/inappropriate choice of venue [9, 10].

Here we look at the following questions, reviewing publicly visible evidence appearing within our dataset, to explore how Twitter was used during the riots:

1) Is there evidence to suggest that Twitter was used as an organizational tool during the riots, and what uses were made of it?
2) What can we learn from retweets? Do tweets primarily influence individuals toward new concepts, or are retweets performed primarily when the tweet confirms existing beliefs?
3) What uses/analysis might be made of real-time data from Twitter during events such as these?

As a consequence of the sudden ascendance of Twitter in the media environment, researchers have come to view it and similar tools as a useful resource susceptible to a broad variety of possible uses and analytical methods. Sentiment analysis, for example, may be applied for opinion mining, which, in turn, may be used by businesses in order to gather opinions about a product or the public image of an individual or establishment or for political purposes to establish the popularity of policies or proposals [11]. However, it is not an easy task. The enforced brevity of messages (140 characters or less) and the informal and specialized language make established approaches, such as part-of-speech tagging and sentiment lexicons, less effective [12]. Message content may be subjective or objective, informational or opinionated; Barbosa & Feng [13] find that the most prolific tweeters frequently are advertising a product or service.

Methodology

Tweets were harvested and stored in a local database. Twitter wasn’t always available, possibly due to server load, so coverage is incomplete. The dataset includes the August 9-11, approximately half of the disturbance, as well as its aftermath. Coverage is limited to tweets mentioning selected hashtags, notably #londonriot and #riotcleanup.

Following the harvesting process, we began by taking the following steps:

1. Identifying retweets and duplicate tweets
2. Identifying references to other participants in the social network, enabling a graph of participation to be built
3. Identifying repeated phrases, loosely describable as noun phrases plus relevant, usually adjectival, modifiers (police car, burning police car, vigilant people, long night,…).
4. Identifying individuals and locations (David Cameron, Clapham, …)
5. Identifying URLs and preprocessing them in order to identify their target URLs (if the link goes through a URL redirection service).

The quantity of data involved in this sort of study is large enough to make automated (or semi-automated) analysis highly desirable, provided the methods used yield sufficiently high-quality data. Manual data analysis must be performed where necessary in order to check the accuracy of these methods.

We used natural language processing to identify interesting terms, indexing tweets according to the occurrence of these phrases. This enables us to build up frequency tables of interesting phrases, allowing us to identify popular topics and change in topics over time. The data includes a great deal of noise, but there are various ways of mitigating this problem – machine learning methods are particularly useful, using existing knowledge to clean up results and improve accuracy. One task that does present a
problem is identifying individuals by nickname or partial reference, although working from an ontology can help with this challenge.

There are similar difficulties of ambiguity in identifying locations. A contemporary gazetteer (a location database designed to support the extraction and resolving of place names from texts) may be used for this purpose. However, the success of this tool is at best partial, since there are many examples of contextually bound information, such as “on the street outside” or “near my office,” terms that require more contextual information to resolve successfully.

URL shortening services (that is, services that provide a short URL, or web link, to be used in place of the original link) typically provide a redirect instruction to the browser, pointing it to the intended destination URL. We found well over two dozen URL shortening services in use, including “vanity” services from many newspapers and news services, including British, American and European services. Vanity services are designed in part as a utility and in large part for the purposes of branding. For each link, we identified both initial and destination (resolved) URLs.

Results

Six hundred thousand tweets were stored and analyzed as described above for topic, content and reference.

Topic of Tweets. Our findings indicate that, twinned with a supervised learning algorithm such as a Bayes filter (a system trained on an existing reference data set) in order to classify types of entity, it is plausible to identify individuals (David Cameron, Boris Johnson), named events (England v Holland match), times/dates (tomorrow night), organizations (Sky News) and collective identifiers (London rioters, police officers). It is also possible to identify theme-relevant compound terms such as rubber bullets and water cannon (proposed for use, but not employed during the disturbances) as well as social media and Facebook page, terms that appear extensively as a result of discussion in the traditional and new media about the role of social media in organizing and propagating the riots.

Proportion and Content of Retweets. Retweeting is commonplace; slightly under half (over 48%) of the tweets identified contained a retweet. Slightly over a quarter of non-retweets (original tweets) contained one or more links. Of retweets, 45% in our dataset contain one or more links (an actionable URL). These refer to a variety of sources, notably traditional media web presences and social media sites, including social networking sites such as Facebook, image hosting sites such as yfrog and Flickr, and others.

Twitter and Media. A complete review of the most popular resources falls outside the scope of this paper, although we intend to review them in detail in future. The evidence shows us clearly that many of the individuals tweeting on the riots draw inspiration from news articles or directly make reference to news articles. News sources referenced include British newspapers, TV stations and websites; international sources are also discussed, including central European sources and North American sources among others.

The most common phrases visible in the dataset appear to be driven by traditional media. While the danger zones for riots in London, Birmingham, Manchester and Bristol are represented in the data, they appear with a relatively low frequency compared to themes arising from media coverage on topics related to the riots.

The influence of the classical media coverage is clearly visible from the extracted noun phrases: for example, water cannons, rubber bullets, the England vs Holland Match tomorrow night and so forth. From the evidence collected, it appears that most people were either tweeting or retweeting news related to the riots. By contrast, original information or opinion appeared in a minority of tweets.

Social media as an information source. Analysis of the most popular links suggests that a large proportion of the most frequently mentioned links are themselves products of social media – images published online through yfrog, for example. Interestingly, the single most popular sites referenced are images rather than textual resources; for example, there is a famous image from this time, showing a sign from the front door of a Subway restaurant containing the handwritten text, “Due to the imminent collapse of society, we regret to announce we are closing at 6pm tonight.” Each of these very popular images is separately identified by a large number of web links – several different URL shortcuts have been used by different twitter users.
There are also many resources from Facebook, blog sites such as Tumblr and others which have become major parts of various campaigns such as the money-raising campaigns mentioned earlier. Another popular set of resources is the e-petitions website belonging to the UK government, which was quickly populated with a set of demands, requests and suggestions relating to the riots, such as “Convicted London rioters should lose all benefits.”

**Identifying New Information.** Through detailed content analysis (semantic analysis of part-of-speech tagged data such as searching for specific types of event, categories of incident and so forth) it is possible to extract various examples of reports of specific events – fires, crimes, police presence and so forth. However, Twitter seems to be less effective for crowd-sourcing than might be expected, due to the huge RT (retweet) echo effect from those who are not directly involved, most of whom appear to be reacting to media coverage rather than directly reporting individual experience.

**Performance Tweets.** Of apparently suspicious tweets, there are a number that riff on current events for comedic value. For example, a tweet that ostensibly advertised a Craigslist London advertisement for 40 16GB iPhone 4 units, “brand new and sealed,” in fact sarcastically parodied the original advertiser’s response to queries regarding the devices’ authenticity: “Honest, I bought 40 iPhone 4s for friends and family and they just don’t want them.”

Some can be identified through telltales such as references to memes (loosely definable as “widely propagated catchy ideas” [14]).

As is the case in sentiment analysis in general, sarcasm and metaphor are stumbling blocks. Human judgment, if supplemented with relevant contextual information and background knowledge about the community, is still not always able to tell for certain whether a tweet is satirical or intentionally inflammatory in intent; context is the key.

**Hashtag Selection.** The emergence of a dominant #hashtag (as seen in Figure 2) for a channel is not a simple matter of nomination and acceptance. Sometimes it is a collaborative process, sometimes it is competitive and often the process seems to involve elements of both. It could be described as a special case of what Cattuto et al. [15] call “semiotic dynamics,” meaning the process of developing and sharing a name for something, with the practical aim of using it to talk about the object in question. Leaving aside the details, the development of a term from a temporary label to a general convention is a feature of many parts of the social web, such as social tagging [15] and #hashtag development [16].

In Figure 3, the tags are associated with actions that individuals can take as part of their beliefs or agree to promote for the original tweeter. The chart shows approximate numbers, estimated through Google’s site-search function. An interesting result seen in Figure 3 is the way in which apparently duplicate terms can coexist; another is the use of idiomatic phrases. Many of these phrases are in-jokes of one kind or another and are not very accessible to those who are not familiar with British humor.

Our methodology was based on the assumption that popular resources would be referenced under various names, and Figure 4 shows that such variety is indeed the case. On the whole, it seems that popular resources are referenced under many names. This practice has several effects, one being that it is difficult without individually checking out the destination of every
link to find out precisely how many people are talking about the same thing – indeed it is quite possible for many people to talk about the same web page without knowing it! Another is the extreme dependency on URL shorteners. Their use may make it difficult for people to understand the context of archived conversations, since, if these shortened links no longer work, people will no longer be able to see the resources being discussed. Discontinuance is a problem not only because of the possibility that the resource itself has been taken offline, but also because the URL shortener may have been discontinued as a service.

Hashtag Adoption and Individual Twitter and Media Profile. It is often difficult to identify the source of ideas, including #hashtags. Retweets of an individual tweet do not necessarily identify the originator of the idea; instead, they usually identify the individual who formulated the tweet in its eventual, popular form. To explore the question of whether there is any correlation between the popularity of the hashtag and the new or traditional media profile of its supporters or originators, we extracted the top 10 entirely unaltered retweets (retweets that contain only the body of the original tweet, along with the retweet markup). These examples were chosen because there is no obvious mechanism to analyze the sentiment behind the decision to retweet; that is, there is no contextual information available on which to base a judgment. For the sake of argument, we assume that in the majority of cases the individual agrees with the content of the message.

Statistics from these retweets show that of the top 10 retweets in this category, the majority – and four of the top five – originate from celebrities and media figures. The most popular originated with Piers Morgan, a former newspaper editor and now a television presenter who has recently moved to CNN to replace Larry King with an evening interview program. The originator and driving force behind #OperationCupOfTea was Sam Pepper, a contestant on the reality television show, Big Brother. Others included a crime journalist; a musician; actor, writer and comedian Simon Pegg; and former pop musician turned television presenter and physics professor, Brian Cox.

Figure 5 reviews the top 25 unaltered retweets. It compares the number...
of followers attracted to a given account with the number of retweets received by a popular tweet originating from that account. The result suggests that there is a visible variation in the ratio between the number of followers and the number of retweets received; graphing this information shows a fairly coherent group of non-celebrity Twitter users, which appear in a different region of the graph from the broader range of celebrity users. The usefulness of this observation depends on how well it generalizes to a broader dataset, which we will investigate as part of our future work.

**Conceptual Ontology.** It is interesting not only to look at the content, what is being said within the tweets, but to analyze the structure of the tweet hashtags. Viewing the hashtags over time, these tags can be placed into a hierarchy of parent/child relationships depicting how the information of the tweets’ hashtags are being passed along. This hierarchy is referred to as a conceptual ontology [17], where the concepts in the hierarchy are actually the hashtags themselves.

In Figure 6, the hashtags from the top 10 retweets were analyzed over time to see which hashtags appeared first, next and so forth, such that, later tweets, with other hashtags (such as siblings), can also be seen. In these top 10 tweets there was a total of 6 hashtags used. As we have already seen earlier in this article, #londonriots was the first and number one hashtag of the retweets and appeared the most often; therefore, this hashtag will be put at the “root” (top) of the hierarchy indicating that all other hashtags have something to do with this one. The next three hashtags appear in tweets as siblings; that is, they are not emanating from each other, but are equals. Therefore, in the ontology they will be at the same level. In tweets about the Blackberry Messaging Service (BBM or BMM) it is interesting to see that tweets using the hashtag referencing the BBM (support of) and tweets referencing #BlockBBM (block out BBM) are seen as siblings in the hierarchy and not as parent/child. We also see that out of the #BMM hashtag grew the #OperationCupOfTea, but not out of #BlockBMM. This indicates that people in support of the BBM were also in support of #OperationCupOfTea (remember that is people with their own imposed curfew), while people not in support of the BBM (#BlockBMM) were not retweeting the #OperationCupOfTea hashtag. The hierarchy, thirdly, indicates that #wombles hashtags grew out of the #riotcleanup people, but not necessarily the people that were following #BBM or #BlockBMM hashtags. More analysis of the conceptual structure of the hashtags’ ontology will appear in future work.

**Conclusion**

Looking at data from Twitter may be challenging, but it is also worthwhile – it frequently reveals fascinating trends. From the data that we were able to retrieve from Twitter on the London riots, three aspects of tweeting became clear: 1) people support and retweet conversations that support their beliefs; 2) tweets that are off topic and have unrelated information die on their own; and 3) tweets that are made by popular or newsworthy people are more supported (retweeted), in general, than non-notable people. There’s little data to support the idea that the service was widely used for inappropriate uses – tweets of this nature generally either die out without being retweeted or are retweeted to “name and shame” the offender.
Knowledge Management of Social Networks

Resources Mentioned in the Article


Knowledge Gained from Action and Reaction Learning in Small and Medium-sized Enterprises: Two Sides of the Same Coin
by Maria Sarabia and Maria Obeso

In this article, we explore the behavior of leaders and followers within interaction systems in the business environment, using the example of small to medium-sized enterprises (SMEs). In order to understand this behavior and the issues surrounding it, we should first describe the typical behavior of leaders and followers and explore the competitive way in which they interact. Rival firms often show a tendency to agglomerate or cluster in close geographic proximity. Research in management suggests that the external environment confronted by individual firms within such clusters may differ from the environment faced by similar firms outside the agglomeration. In his book *Micromotives and Macrobehavior*, Thomas Schelling explains this behavior as follows:

People are responding to an environment that consists of other people responding to their environment, which consists of people responding to an environment of people’s responses…To make that connection we usually have to look at the system of interaction between individuals and their environment…[1, p. 14]

As Schelling observes, firms respond not only to what they perceive as relatively objective environmental factors, but also to the actions of other firms. They in turn are responding not only to the same environmental factors, but also to the actions of the first set of firms [2]. This is the description of a competitive market – an interaction system.

Imitation is accepted as commonplace in many business domains. For example, firms imitate each other in the introduction of new processes and products, in the adoption of management strategies and even in entry to new markets and timing of investment. In this way, when competitors take...
similar actions, there is less chance that any firm will succeed or fail relative to others. This preserves the balance between leaders and followers, even in industries where there is a strong rivalry.

Lieberman and Asaba [3] suggest that attempts to describe imitative behavior fall into two general categories:

- information-based theories: firms that appear to enjoy privileged access to information are followed by other firms, and
- rivalry-based theories: firms imitate others in order to maintain competitive parity or balance in their grouping or clustering of information.

Information-based theories apply in environments of uncertainty and ambiguity where managers cannot definitively assess how action and market performance are connected. In such cases managers are likely to look for informational clues implicit in the actions of others. The most famous theory pertaining to this behavior is information cascades or social learning [4, 5]. According to Bikhchandani et al. [6], information cascades occur when there is a greater economic benefit to be gained in following the behavior of others than in acting from one’s own understanding or private information. For example, a manager may elect to follow a management trend rather than to follow strategies that he has found successful in the past. One possible reason for that decision is the perception that the fashion leader is likely to have superior information. Small firms may follow larger rivals, believing the latter to be better informed. In the same way, firms that have been successful in the past are more likely to be imitated.

Another interesting concept within information-based theories is proposed by DiMaggio and Powell [7]: isomorphism. These authors argue that rational actors make their organizations increasingly similar when they try to change them, leading to mimetic isomorphism, a process whereby organizations model themselves on other organizations when the environment is uncertain. The modeled organization is perceived as more legitimate or successful, and such modeling is a rational behavior because it economizes on the search costs to reduce the uncertainty that organizations are facing [8].

Lieberman and Asaba’s second approach is centered around the notion of competitive rivalry [3]. Firms imitate others in an effort to maintain their relative position or neutralize the aggressive actions of rivals. In this case, firms’ actions are not about conveying information but instead suggest that imitation to mitigate rivalry is most common when firms with comparable resource endowments and market positions face each other. Porter [9] suggests that firms within the same strategic group may adopt similar behavior to constrain competition from outside sources.

We have seen that this process of imitation is an important factor in corporate decision-making, but what impact do environmental factors have on the ways in which SMEs within a given interaction system act, reason and learn? In answering this question, we begin by exploring the active learning process from the viewpoint of knowledge (cognitive development of learning) and subsequently look at behavioral levels or change in levels linked to the learning process. As we will show, the reactive learning process can be seen as a consequence of considering environmental factors, and a firm can learn from others as a consequence of previous actions by its leaders.

**Action Learning as Internal Process within a Firm**

An organization learns when knowledge held by each individual who is part of the group is shared beyond temporal, spatial or structural limits. Just as each individual must learn to surmount changes in his or her circumstances, so must the organization. In this way, learning can be seen as the key tool in the management of companies in turbulent environments. According to Huber [10], learning can be defined as the organization’s ability to self-adapt to environmental changes, to be flexible and respond quickly with appropriately chosen actions, enabling implementation and management of internal change within the organization. Garvin [11] explains that an organization that learns needs expertise in five areas: systematic resolution of problems, experimentation of new focuses, use of their own experience and past to learn, learning from the experiences and practices of other companies (benchmarking), and transmitting this knowledge to the whole organization, quickly and efficiently.

Argyris and Schön [12] propose two learning types: 1) single-loop
learning, which involves making continuous adaptations to keep the organization stable and within normal operating parameters; 2) double-loop learning, which involves being prepared to question the fundamental values and parameters under which the organization operates. Nonaka and Takeuchi [13] contribute a point of view of their own: The creation of knowledge implies the interaction of both single- and double-loop learning. Then, within the idea of “an organization learns,” we cannot forget Senge [14] and his MIT colleagues, who, in their desire to model organizational learning, laid down five disciplines as prerequisites:

1. to adopt systemic thought,
2. to encourage personal abilities,
3. to have doubts about the traditional mental models,
4. to generate a shared vision and
5. to facilitate team learning.

The real problem of learning lies between what is known and what should be known. Under some circumstances, individuals may develop defensive routines, preventing the situation from being clearly or accurately perceived. As a consequence, mental models are sometimes built on the basis of distorted perceptions, thereby reducing the perceived necessity of learning [15]. What is the nexus of union between knowledge and learning? Garvin [11, p. 56] was able to establish a clear relationship between both concepts: “An organization that learns is an expert organization in creating, acquiring and transmitting knowledge and in modifying its behavior to self-adapt” [author’s translation].

Following Nonaka and Takeuchi [13], knowledge creation takes place at three levels: the individual, the group and the organizational levels. Developing their theory, they also identified two forms of knowledge interaction (tacit and explicit). The forms and the levels must both be developed in the knowledge creation process (see Figure 1).

Knowledge interaction represents the different modes of knowledge: tacit and explicit. In the epistemological dimension, knowledge derives from its distinction between tacit and explicit. In the ontological dimension, organizational knowledge creation is understood as a process that amplifies existing knowledge created by individuals and crystallizes it in a shared knowledge network. Thus, the knowledge curve that results by graphing the two dimensions shows how knowledge is created from individual to organization and from tacit to explicit.

If we analyze knowledge creation at the group level, it is interesting to examine how, on a group level, knowledge is transmitted from an individual to the organization. At the same time, the information transforms from being tacitly understood to explicitly stated. On the individual level, this epistemological transformation explains how tacit knowledge is created and transmitted to the group, becoming explicit. The group dimension is defined as a set of individuals who develop knowledge from its tacit origins into an explicit representation. A group of individuals possesses both types of knowledge, tacit and explicit, shared by individuals with the group, and finally maintained explicitly as organizationally shared knowledge.

However, knowledge and action are far from synonymous. Fiol and Lyles [15] hold that, especially in the context of organizational learning and adaptation, there is an important difference between cognition and behavior.
Changes in behavior may occur without any associated change in cognition or belief or knowledge may be gained without any accompanying change in behavior.

Fiol and Lyles propose a figure for understanding changes in behavior and level of cognitive development (see Figure 2) and further define stances commonly taken by firms on the topic of change and learning and how firms may react to changes in the broader environment:

- **Position A** is typical of bureaucratic firms where no learning takes place and no attempts are made to change. This position is common in a stable and predictable environment.

- **Position B** represents firms that regularly take actions and change strategies but within which very little learning takes place. This position is recommended in an environment in which accurate prediction is impossible.

- **Position C** (high learning, low change) is the most appropriate behavior in a turbulent environment in which innovation is crucial for survival but too much change would result in the firm losing its sense of direction.

- **Position D** (high learning, high change) is appropriate in a moderately turbulent environment where firms are agile and adaptive, constantly changing with few defined rules because they are better at learning, problem formulation and problem solving.

This raises the questions of how, what and how much an organization should seek to learn. Revans [16] believes in generating knowledge through experience — working with and learning from practical problems — rather than the application of pre-existing knowledge (book-learning). He describes this approach as “action learning.” In his famous formula, Learning = P + Q, the “P” stands for programmed learning, whereas “Q” represents learning that comes from asking questions and looking at evidence. In consequence, Revans argues that a team must be organized into two groups: the task of the first is to complete the project by solving the problem, while the second group is to learn from the experience. In this sense, action learning involves the following major steps [17]:

- Organize into a team with ownership of problems
- Use diversity in team formation when possible
- Allow few planned programs but require much questioning
- Use a team advisor if needed
- Meet regularly to discuss solutions to the problems
- Once problems are solved, continue to meet to focus on learning and reflection
- Conclude action learning only when all relevant learning is gleaned from the projects

As we have seen, knowledge and learning are closely linked. Knowledge may be converted from tacit to explicit representations and be distributed by the individual to the broader organization [13], a model that is crucial in understanding how different levels of learning and levels of organizational change are influenced by the environment [15]. Furthermore, Revans’ approach [16] defined action learning as a step-by-step process where teams distinguish between solving a task and learning from the experience, identifying two types of learning – programmed versus exploratory – questioning investigation.

It is important to recognize that environmental factors can have an effect on behavioral development or change, as well as on cognitive development or learning level. In consequence, environmental factors can affect the
process of action learning. At this point, in-depth study is required to understand how action learning and environmental factors influence different organizational behaviors, such as the mimetic or imitative instinct (“followership”) exhibited by firms within an interaction system of SMEs.

We suggest that one of the missing elements in this analysis is reaction learning. Revans’ approach can be adapted to explain rivalry strategies in which action-reaction behaviors are adopted within a competitive market. In this sense teams within the firm adopting this imitative strategy also distinguish between two tasks: imitating a process adopted by a leading firm and adapting it to the firm – that is, imitation – and learning from experience. In the remainder of this article, we explore how a group of SMEs within an interaction system can obtain knowledge developed through an action or reaction learning process.

**Reaction Learning as a Consequence of the Interaction System among SMEs**

Many studies of knowledge use in SMEs suggest that knowledge is gained through the tacit experiences of specific individuals. For example, Honig [18], who explored learning strategies used by entrepreneurs and intrapreneurs in Sweden, found that entrepreneurs tended to use unstructured flexible processes, used external networks and avoided established patterns of doing things. Floren [19] found that owner-managers (directors or senior management within an enterprise) learn by exposing themselves to opinions originating outside the enterprise. So, the criteria for success relate not only to self-motivation and vision, but the entrepreneur’s ability to adapt to external influences [20].

Entrepreneurial knowledge structures explore the idea of how entrepreneurs learn from others and how others learn from entrepreneurs. This approach reflects that other external factors have an effect on learning behavior within SMEs. Following Revans’ approach [16] to describing action learning, a similar approach can be used to demonstrate how a small or medium-sized enterprise within an interaction system develops its action learning process. There are learning activities that take place during every day working life. Revans emphasizes that this learning comes from questioning. However, Revans does not indicate if this learning process primarily involves internal experiences or outside influences. If we modify Fiol and Lyles’ learning/change levels to add this distinction, we can then modify the four positions (A, B, C, D) as discussed below. Table 1 summarizes this expanded model.

**TABLE 1. Fiol and Lyles’ four positions related to action, reaction and programmed learning**

<table>
<thead>
<tr>
<th>Positions</th>
<th>Programmed learning (P)</th>
<th>Inside &quot;action&quot; learning (Q1)</th>
<th>Learning by outside observation (Q2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: Low learning level,</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Low change level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B: Low learning level,</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>High change level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C: High learning level,</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Low change level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D: High learning level,</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>High change level</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Looking at the table we can see the following:

- **Position A** (a stable and predictable environment: bureaucratic firms, no learning and no change): There is no programmed learning (P) and no incentive for change or learning from insiders (Q1). These firms are also looking at outsiders without thinking about any improvement (reaction learning, Q2).

- **Position B** (unpredictable environment characterized by quick reactions): These firms are not looking at insiders in order to learn because they are very worried about competitors and acting quickly for survival. The programmed learning (P) is a consequence of observed learning from outsiders (reaction learning, Q2).

- **Position C** (turbulent environment in which firms produce innovations): For that reason, they do not learn from competitors (Q2), but they do learn from insiders and their way of doing innovative work (action learning, Q1).

- **Position D** (moderately turbulent environment, firms constantly changing with a few well-defined rules): Program learning is therefore
close to zero but the observations from insiders and outsiders (action and reaction learning, Q1 and Q2, respectively) are relatively significant components in the system overall.

This analysis of learning from outsiders (Q2), or by analogy to the term coined by Revans, reaction learning, explains a class of observed behavior exhibited by SMEs within an interaction system. Firms can learn either by leading the way and learning from the consequences or by following the actions of their close competitors – action and reaction.

**Conclusion**

This article investigates behaviors of leaders and followers within interactive systems. It can be seen that the process of imitation is crucial in environments where uncertainty is present and where the firm’s strategy is not only to consider internal and personal factors, but also to hope for risky decisions to be made by competitors. By evaluating these behaviors, the close link between knowledge and learning can be examined, revealing that action and reaction learning are two sides of the same coin.

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**Resources Mentioned in the Article**

Managing Your Medical Data
by Charlene Johnson and Deborah E. Swain

since passage of the 1996 Health Insurance Portability and Accountability Act (HIPAA) and the Health Information Technology for Economic and Clinical Health (HITECH) Act to support health information exchanges (HIE), efforts to convert medical information from paper documents into electronic health records (EHR) have increased dramatically [1]. Concerns by medical informatics developers and healthcare practitioners are shifting from conversion of data to the sharing of data and the application of analytics to large databases and exchanges [2]. We have witnessed this transformation in information research and application development in the United States [3]. In an effort to study personal knowledge management of medical data, we have selected examples that reflect current practice in healthcare records and tools in the United States from the American Veterans and Wounded Warriors online programs. The important issue of trust is well illustrated in these efforts. We review here data tools and EHRs already in place for U.S. veterans and anticipate some future approaches to knowledge management of health information in the states.

Establishing Trust
The first requirement for the veterans’ online healthcare providers or any provider [4] is to establish trust in informatics tools and web-based data storage of personal information among veterans who are patients. A professional, job-based familiarity with government bureaucracy for service persons might seem to make the task easier, but maintaining that culture of trust is evidently a concern in introducing veterans to the My HealtheVet program and tools. Moreover, standard correspondence from the government introducing veterans to any health services and announcing changes or enhancements to their services includes web links to educate veterans and email or electronic copies of statements about legislative initiatives or policies. In this case, for instance,
the site provides orientation in the form of a virtual online tour (available under the “Help” tab on the My Health eVet home page) [5].

In addition, when gradually rolling out a new online health tool, such as My Health eVet, the Veterans Administration (VA) has typically provided in-person contact with representatives to answer any questions or concerns. This person-to-person connection allows users to use and gain confidence in the online service tool and/or resources. It has been a supportive communication approach to the transition from paper to electronic health records for veteran patients with representatives available to answer questions and respond to concerns.

**Steps for Establishing Online Health Knowledge Base**

For the My Health eVet system, veterans must first register by creating a My eHealth user profile [6]. The profile requires basic information and actions:

1. Provide basic identifying information
2. Identify relationship to the VA
3. Describe donor information
4. Provide primary healthcare information
5. Provide contact information
6. Respond to request for health awareness information
7. Set up unique ID and password (with answers to password hint questions)
8. Accept the Terms and Agreements and Privacy Policy

Once registration on My Health eVet has been accomplished, patients have various health online services available and are able to use specific components of VA health care. For example, a registered patient can view current emergency contact information, and his or her personal profile can be edited or updated as required. In addition, veterans can easily download their personal health data and information.

To maintain services and manage their health knowledge, users need to review and update their online health record identities. In other words, they must maintain their My Health eVet accounts by making password revisions as required, retaining in-person authentications as needed, and keeping the accounts active. The web portal requires personal authentication to allow use of enhanced features that support online viewing of electronic medical records. Actual account holders can view and work with their information after logging in.

The most popular resource available in the My Health eVet system concerns prescription medicines. Participants can use a prescription refill feature (the service used most often by most veterans) and keep track of data on all refills, medication history including overlapping and changing medications, information on medicine and herbal supplement interactions and a database list of VA medications.

**Authentication Process**

The process of in-person authentication (IPA) allows participants to access enhanced functionality via their My Health eVet account with an underlying objective of maintaining a high level of security for the online medical information. This functionality is used for routine, non-life threatening communication. IPA requires patients to physically visit a My Health eVet representative at any designated veteran healthcare facility. Representative confirm that the participants are registered as VA patients in My Health eVet and that they have viewed the online My Health eVet Orientation Video at www.myhealth.va.gov. Participants who have not viewed the orientation video will be given the opportunity to do so prior to beginning the IPA process. Participants must orally state full names, social security numbers and birth dates. Representatives access the patients’ online records and verify information on screen with government-issued photo IDs provided by the participants. Participants are then given the VA’s Release of Information Form (Form # 10-5345a-MHV) to complete and sign. My Health eVet representatives confirm that the IPA process has succeeded and informs participants that advanced functionality will be available within 12 hours. Once the IPA process is in effect, participants will no longer be able to make changes to the following fields in their account: first name, last name, date of birth, Social Security Number and relationship to patient.

**Secure Messaging**

The latest My Health eVet feature is a secure messaging system that supports telemedicine and interactive, online communications in real time.
The messaging system is designed to provide patients with a means of viewing current medical records online, communicating with a primary care health team, requesting a medication renewal and updating address information. This feature is being rolled out in phases throughout 2011. A network security authentication process is mandatory for veterans to use this feature.

**Setting Up and Using Secure Messaging.** The following steps are required to set up and use secure messaging:

1. Member login with User ID and password
2. Select the SECURE MESSAGING tab
3. Click the orange Open Secure Messaging button
4. Read the Terms and Conditions and opt in to use secure messaging

Upon completion of the secure messaging account set up, participants can access the preferences link to set up email notifications of new messages or to opt out of secure messaging at any time.

**Secure Messaging System Operations.** Providing an intuitive interface with the same features participants are accustomed to seeing when using Yahoo or Google email applications facilitates easy navigation. Secure messaging contains four primary folders: inbox, drafts, send and deleted. Participants can create their own personalized folder system under My Folders to organize their messages for easy retrieval and viewing at a later time.

There are two options for creating a message to send to the healthcare provider: free-text or a predefined message. The free-text message allows the participant to type a subject or to compose a message without any predefined components allowing the participants to freely communicate healthcare needs and inquiries in their own words. Participants are advised by the My HealtheVet representative to confirm that they have addressed their messages to the correct healthcare team members prior to sending a secure message. Providers have 48 hours to respond to the message. However, if the message is inadvertently sent to the wrong provider, the message will be re-routed to the My HealtheVet coordinator to confirm the correct provider and be re-sent to the correct healthcare team member. The secure messaging feature is currently only available to primary care providers and not to the specialty clinics. The participants receive an e-benefits user guide for veterans as well as printed information on My HealtheVet secure messaging, how to refill prescriptions and how to view appointments, and they are given a business card with the My HealtheVet coordinator contact information.

**Shared Health Responsibilities and Interactions**

An important aspect of the VA approach to online medical records is the active participation of patients in their own knowledge management. Studies have shown the efficacy of this approach [7] in particular where health disparities exist in specifically underserved racial or ethnic communities [8]. For example, through the VA, online health journals are provided to encourage veteran patients to self-regulate health conditions by keeping a virtual record of their medical data. The following information is recorded and maintained: vital readings, lab histories, changes to health histories and daily activities (specifically exercise and food intake). The VA patients are also able to use this site to maintain their journals.

Interactive tools featured in the My HealtheVet system are part of the online educational centers for healthy living and display this introductory information on accessing data records and taking an active role in improving their health as described on the site’s Healthy Living Centers page [9]:

The Office of Veterans Health Education and Information within the VHA National Center for Health Promotion and Disease Prevention, in collaboration with the Office of Public Health and Environmental Hazards, has developed a library of educational and health promotion materials on healthy living to enable Veterans to take control of their own health. VHA is in the process of developing a full library of topics for this website.

When health care is required, patients can use the “Get Care” tool to track data about their condition, but the tool depends on their documenting specific records online [10]. First, the patients must list their caregivers and record all health-related information about the caregivers. In addition, patients list all their treatment facilities, providing data about all the clinics and health centers where they have been treated. Thirdly, records of healthcare coverage are required, so that veteran patients can keep health information in one place. Finally, the health calendar feature is interactive and helps patients keep track of their health appointments, meetings and to-do task lists.
Another interactive, support feature of My HealtheVet is the provision of links and connections that allow veterans to be part of online communities of practice (CoP) for knowledge management of healthcare data. The My HealtheVet (MHV) community provides links to information about:

- VA benefits
- events and programs
- VA honors vets
- how to get involved as a volunteer
- veterans’ health news

Collaborative Application Use among VA Entities

The in-person authentication process is presently being phased out and will be replaced by the VA authentication federation infrastructure (VAAFI) that links participants’ VAAFI credentials to My HealtheVet. The overall objective for VAAFI is to serve as a single portal of entry for supported VA and DOD applications. Operational Research Consultants, Inc. (ORC) is a provider of a service called ORC eAuthentication through the use of secure online information technologies. ORC eAuthentication provides third party individual identity credentials (login IDs) and authorization services to My HealtheVet, the healthcare initiative; a remote order entry system (ROES), which provides online ordering of medical supplies and healthcare products to veterans; and the electronic contract management system (eCMS), a government vendor resource portal.

The process for ORC eAuthentication is similar to, but more stringent than, the in-person authentication and upgrades the participant’s ability to access and use government resources beyond My HealtheVet. The process follows the National Institute of Standards and Technology’s (NIST) four levels of assurance, which provide a tiered credentialing process to protect the participant’s identity and to maintain a high level of security for access to certain government sites. ORC eAuthentication requires the following participant actions:

1. Complete the online portion of the registration on the ORC website at https://csp.orc.com/reg/SelectApp after logging in to your account.
2. Print registration form and have it notarized.
3. Send notarized form to the address on form, either by certified U.S. mail, Federal Express or United Parcel Service.
4. Receive verification by third party (ORC).

The security of government websites is obviously a major concern and requires mechanisms to be in place to deter unauthorized use and illegal online behavior. As a part of their security measures, ORC provides monitoring of the system. Participants are informed that all activities will be monitored, and use of the system serves as consent (see Sidebar). Note: access and privacy issues need to be considered for all health information, and veterans’ services come with monitoring. Only time will tell if such scrutiny will hinder participants’ willingness to utilize the online government resources and services.

Personal Knowledge Management Research Questions

Knowledge engineering, information science and systems development research questions remain with electronic health and medical systems like My HealtheVet. As more corporate and government systems are developed in the United States using cloud network services, questions about security seem to have become a priority. The implications of emailing personal and confidential information via secure email and the Internet impact the
cooperation and participation of patients. Is there any way to ensure total security of emails? How do healthcare providers continue to gain the trust and confidence of patients using online services and resources?

Recent research suggests that the use of Web 2.0 social media will remain a prominent tool for healthcare professionals to educate, communicate, deliver and address health-related issues. The utilization of social media can complement direct care services through immediate online information, for example, on a Facebook site that addresses a particular disease or in a blog [11]. Interaction among members going through the same experience can serve as support between and beyond visits to the healthcare provider.

Summary

Healthcare knowledge management systems from companies such as Siemens, SAS, Oracle, Teradata and IBM are currently being announced as products and recommended to doctors and hospitals in the United States. Pressure to collect problem list information electronically is growing as regulations like ICD-9 and ICD-10 (9th and 10th revisions of the *International Classification of Diseases and Related Health Problems*) require doctors, clinics and hospitals to maintain up-to-date lists of current and active diagnoses. In medical and health informatics, specific codes for illnesses and conditions are required, just as Medicare and Medicaid funding requires these codes in records. Furthermore, the use of patient-centered database systems like My HealtheVet will allow the application of analytics to HIEs and data warehouses of aggregated data on diseases, medical conditions and health problems to improve health care worldwide. As this paper shows, “trust” and “participation” will be important aspects of healthcare informatics and the knowledge management of your medical information.

Resources Mentioned in the Article


I’m a middle-aged fellow who recently visited a massage therapist. He asked me to move my body; I apparently did it wrong, and he commented, “You sure are uncoordinated.”

I don’t believe this arrived to me as news. I recalled that label from public school days, when those of us who were deemed “uncoordinated” were lined up against a wall and pummeled with dodge balls. Instead of reflecting on those good times, I wondered (oddly enough) how the dictionary defined uncoordination. So I looked it up.

The thesaurus offered these synonyms: clumsy, awkward, ungainly, bungling, lumbering, inept, graceless, heavy-footed, maladroit, clodhopping, all thumbs, ungraceful and butterfingered.

That’s uplifting, isn’t it?

And then I noticed the second group of equivalents: disorganized, confused, chaotic, disordered, muddied, jumbled, haphazard, unorganized, unsystematic and unmethodical. I read this example: “Government action has been half-hearted and uncoordinated.”

I looked at that statement and I thought “information architecture.” I’m sure I also thought “government communication,” because that’s what I often encounter as a resident of Washington, D.C. But I’m certain that colleagues in other parts of the world have also faced many examples of disorganized, confused, chaotic and disordered information and asked, “What can we do? How can we structure information to improve clarity?”

Like many of you, I’m passionate about crafting communication products that help others understand and act. I appreciate the work by writing practitioners who ask how sentence structure can support humans. I’m intrigued by the work of those of us who explore taxonomic relationships and ensure our tools bring consistency to thought. And recently I’ve become engaged by the thinking of information architects who attend to patterns and components.

**Improving Coordination by Thinking in Patterns and Components**

A pattern is a consistent and recurring trait or characteristic. As humans, we rely on patterns to make sense of our world. When we analyze information, we often look for patterns to identify a problem or a specific phenomenon. We often refer to patterns as indicators or models for predicting behavior.

Patterns play an important role in developing communication products. Developers refer to design patterns as general, repeatable solutions to problems. Online environments will often include design patterns, each a solution that targets a specific need. Yahoo! publishes 59 design patterns (http://developer.yahoo.com/ypatterns/everything.html), each responding to a specific visualization need. UI Patterns identifies hundreds of patterns and provides different routes for viewing these structures (www.ui-patterns.com).
Similar to patterns are components. Like patterns, components support re-use. Unlike patterns, components are more contextual; they will relate to a specific system. If you were to identify components for your system, you would name page-level functions and relate them to specific coding and editorial specifications.

Nathan Curtis, a principal of the Washington, D.C.-area firm EightShapes, defines components in this manner:

A component consists of two or more elements that are combined to result in a structure that is standalone, reusable, design system-specific and uniquely purposeful within a page view. Such components – also known as modules, chunks, portlets, widgets, blocks or other labels, depending on the design context – are always aggregated to compose a holistic page view. Each component evolves to have an understood context and application within the design system’s page grid as well as specifications for behaviors, formats, editorial and more that’s specific to its instantiation in that system (www.nathancurtis.com/2008/02/21/pattern-library-vs-component-library-whats-the-diff/).

How Can I Envision Patterns and Components?

Nathan and his team at EightShapes help clients envision patterns and components as part of the discovery process. They will, for example, conduct workshops to help team members envision similarities (and differences) in structure. He explains it this way:

Nothing beats the energy of getting a team together to mutually decompose an existing design system and arrive at a component library together. From information architects to visual designers, from coding technologists to site strategists, from UX leads to directors, the more you involve, the easier you gain consensus and create a baseline for adoption and practice over time. … Teams slice up screenshots with scissors, organize the multitude of variations and work on grouping, labeling, prioritizing and archiving the results. All the while, individuals work together to discuss assumptions and clarify component roles and approaches (www.nathancurtis.com/2008/03/21/creating-a-component-library-step-1-discovery/).

James Melzer (http://jamesmelzer.com/interaction-design/patterns-resources), an information architect for EightShapes (and aggregator of useful content on patterns and components), recently visited my IA/UX class and described visualization this way: “When we think in patterns and components, we typically think of rectangles or blocks. We might ask how many blocks fit into the visual space we are considering. For example, as you think about a typical web page, you may consider headers, lists, search, account information, logo, banner ads, featured content and/or recommendations as typical patterns we might see on the page. If we drew the page, we would likely create boxes for these elements.”

The advantage to the user – and to a development team – comes from consistency and visual clarity. Certainly, it improves the user experience to have a standard design system. And, if you have assembled these elements into a component library, you are one step ahead.

James suggests these steps for identifying components in your pages:

1. Find unique page types.
   • Take screen captures of the different page types.
2. Include stakeholders in a clipping exercise.
   • Give everyone scissors and Sharpies and ask them to identify chunks of content that are “patterned” or repeated over and over. James says, “You end up with lots of different rectangles – you might find 60 to 100 components.”
3. Catalog and prioritize components.
   • Organize your components into groups. Name your components. And ask yourself and team members, “What do we want to do with this?”
4. Correlate your components with code.
Bake Coordination into Your Products

You can explore patterns and components as part of your discovery process, or you can incorporate your thinking into structured libraries. “Component libraries,” James goes on to say, “improve both user understanding and the performance of our development teams. Because the component library defines the right way to solve common problems, design teams can focus on the unique elements of each project.” He continues, “The component library becomes the forum to discuss the right way to solve new problems and the place to record each decision.” He explains how you can “bake” the personality of the organization into your products.

It makes me wonder how well the rest of us are baking structure into our organizations. Have we taken the time to ask, “What patterns exist in our online presentation? Can we name these components and relate them to specific code provided by our developers? Can we re-introduce these components in all our products?”

At the end of the day, you can ask, “Is my information patterned and coordinated? Or is it disorganized, confused, chaotic, disordered, muddled, jumbled, haphazard, unorganized, unsystematic and unmethodical?” You have a choice.