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Thriving on Diversity: Information Opportunities in a Pluralistic World Page 6
Our annual special section on information architecture (IA) – *A Tonic for the Busy Troops* – is the centerpiece of this issue and a very fine one. Stacy Surla, our associate editor for IA, has put together a collection selected from presentations at the 2009 IA Summit. As they were coming in, I was already emailing friends saying that a number of the articles were going to be must-reads. Immediate utility and impact were Stacy’s selection criteria, and she certainly implemented them well: lots of very timely information for practitioners and some fine thought-pieces. Stacy’s introduction says it all in terms of what’s there and why. Don’t miss it.

Our feature article is another one not to miss. Marko Rodriguez writes about the Web of Data – the RDF (Resource Description Framework) side of the web – and the problems of exploiting it. Whether you are an RDF novice or someone for whom RDF is daily fare, Marko’s ideas and insights will intrigue you. It’s an outstanding contribution.

As though that weren’t enough, we also have our first video clips in this issue – fittingly in one of the IA articles. Adaptive Path IA senior practitioner Kate Rutter considers organizational change through the metaphor of slime mold behavior – and we get to see the amoebas sensing their environment, reorganizing and moving on. One small slither for the slime mold; one large step for the *Bulletin*.

On the ASIS&T side, President Donald Case outlines the Society’s response to proposed revisions in the accreditation criteria for LIS schools that the American Library Association is now considering. Some of the proposed changes could have a big impact, particularly on schools that emphasize programs besides traditional librarianship, including, of course, IS and IA.

In short, it’s an issue with excellent discussion on cutting-edge challenges, and I hope you will enjoy reading it as much as I did while preparing it.
On the Controversy Regarding Proposed Changes to ALA Standards

Quite a bit of online discussion has occurred recently regarding a report of the ALA Presidential Task Force (TF) on Library Education, submitted to the ALA Executive Board on January 13, 2009 (www.oa.alala.org/accreditation/?page_id=44). That report recommends a variety of major changes to the current Standards for Accreditation of Master’s Programs in Library and Information Studies. The TF recommendations were not circulated for comment prior to their presentation to the ALA Executive Board, which is why the discussion of them has been taking place this spring.

Several of us on the ASIS&T Board of Directors were concerned about the nature of these recommendations. On April 13th a letter, over my signature, was sent to the ALA Committee on Accreditation (COA) and copied to various other interested parties, pointing out the problems we saw in the TF’s suggestions (www.asis.org/news/ALA_COA_response.pdf). Our letter highlighted four specific concerns:

1. The proposed changes represent a narrowing of scope for the LIS field, which tends to work against diversity of ideas.
2. A requirement that the majority of faculty teaching in LIS programs be “grounded in librarianship” might also restrict the diversity and interdisciplinarity of school faculties.
3. The recommendations are highly prescriptive (“mandates” is the word ALA used) regarding the curricula of programs.
4. Other stakeholders in the LIS programs that ALA accredits, such as ASIS&T, ALISE and ACRL, were not involved in developing the recommendations.

ALISE and the iSchools have also voiced concerns to COA. Now, no one doubts the good intentions of ALA and the members of the task force nor that the majority of graduates of LIS programs continue to be employed in libraries nor that the ALA made efforts to include a variety of voices in the proposed changes (for example, the task force did include several LIS educators who were members of ALISE and ASIS&T, although they did not represent those organizations). However, given past dissatisfactions with accreditation and limited success in involving other organizations such as ASIS&T in that process, a reservoir of strong feelings remains about the topic. Consequently, online discussions on lists like JESSE tend to generate more heat than light, and I am as guilty as the next person in having fanned the flames. One positive outcome is that more people outside of ALA are now aware of the proposed changes – although many voices, such as those of LIS deans, have been conspicuously absent.

The ALA TF report uses phrases such as “perceived gap” and “perceived inadequacies”; however, it is unclear whose perceptions these are and what observations they are based on. Thus, in my view the wisest response thus far is found in Illinois dean John Unsworth’s letter on behalf of the iSchools (www.oa.alala.org/accreditation/?page_id=61). Unsworth suggests that changes to the standards ought to be based on empirical research regarding the needs of the profession and a subsequent determination of whether those needs are being met by existing LIS programs. In other words, more facts and fewer opinions are needed to inform change.

The TF’s recommendations are now in the hands of COA, which will collect opinions and respond. For those of you who want to comment, the COA has set up a moderated blog for that purpose: www.oa.alala.org/accreditation/.

Should the TF recommendations be enacted, I am sure that we will hear a great deal about them in future years.
Electronic balloting is now open at the ASIS&T website for the election of a president-elect and two directors-at-large. Voting ends on September 30, 2009, with newly elected officers taking their seats on the ASIS&T Board of Directors at the conclusion of the upcoming Annual Meeting in Vancouver.

Candidates for president-elect for 2010 and succession to the presidency in 2011 are Suzie Allard and Linda Smith. Candidates for two director-at-large slots for three-year terms are Caryn Anderson, France Bouthillier, Prudence Dalrymple and Karen Fisher.

Suzie Allard is associate professor and assistant director at the University of Tennessee School of Information Sciences. Suzie has served on the ASIS&T Board of Directors and on a variety of standing and ad hoc committees (e.g., membership, leadership, information science education, etc.) and has received ASIS&T’s James M. Cretsos Leadership Award. She co-founded SIG/DL and has served on task forces for marketing, digital library development and website redesign. Suzie teaches in the areas of science information and digital libraries. Her research focuses on how scientists use and communicate information, particularly within the life-cycle of electronic data. Agencies that are funding Suzie’s research include the National Science Foundation, IEEE and the Institute of Museum and Library Services.

Linda C. Smith is professor and associate dean for academic programs in the Graduate School of Library and Information Science, University of Illinois at Urbana-Champaign, where she has been a member of the faculty since 1977. With support from the Institute of Museum and Library Services, she has worked with colleagues to enhance curricular offerings in digital libraries and data curation and to build a collaborative distance education model through initiatives of the WISE (Web-based Information Science Education) consortium. She received the ASIS&T Outstanding Information Science Teacher Award in 1987 and has served ASIS&T in many capacities since joining in 1972: SIG and chapter officer and advisor, award jury member and chair, conference program committee member and chair, member of various standing committees, and editorial positions with both JASIST and ARIST.

Caryn Anderson is the integration research manager for the ARC Centre of Excellence in Policing and Security at Australian National University in Canberra, Australia. Her work focuses on developing theory and methods for cross-disciplinary research in the areas of integrating and synthesizing disciplinary and stakeholder knowledge, managing what we don’t know and translating research into policy and practice change. Caryn was previously doctoral studies program manager at the Simmons College Graduate School of Library and Information Science, where she received her master’s degree. She came to information science from public policy analysis and non-profit management.

Caryn has held many leadership roles in ASIS&T, including service on standing committees and as chapter and SIG officer. She received the Chapter Member-of-the-Year Award in 2007 and the James M. Cretsos Leadership Award in 2006.

France Bouthillier is associate professor and director of the school of information studies, McGill University. She received her Ph.D. from the University of Toronto, her masters in library and information sciences from the Université de Montréal, and she graduated from the University of Quebec in
Education and Business Administration. Her teaching areas are related to the management of information services, business information and competitive intelligence. Her recent publications and conference presentations deal with the information needs of small businesses, knowledge management, management of information services, training of information professionals and competitive intelligence. She has worked on program committees for several ASIS&T Annual Meetings and as a reviewer for JASIST for a number of years.

**Prudence Dalrymple** is on the faculty of the College of Information Science and Technology at Drexel University where she also directs the Institute for Healthcare Informatics. She holds a doctorate from the University of Wisconsin-Madison and a master’s degree in health sciences informatics from Johns Hopkins University School of Medicine. She has also been on the faculty at the University of Illinois at Urbana-Champaign, was the director of accreditation at the American Library Association and served as dean of the Graduate School of Library and Information Science at Dominican University. Pru attended her first ASIS&T meeting in 1976 as a student and has been an active participant in conferences, committees and SIG/HFIS. She has served on several award juries and standing committees. She is a member of the ASIS&T Task Force on the Information Professional where she is a key participant in the task force’s activities.

**Karen Fisher** is professor in the University of Washington Information School and chair of the Information & Society Center (ISC). She teaches and conducts research on how people experience information as part of everyday life. Frequent author, she is currently studying the benefits of free access to computers and the Internet in public libraries, supported by the Institute of Museum and Library Services and the Bill & Melinda Gates Foundation. Karen holds Ph.D. and MLIS degrees from University of Western Ontario and a bachelor’s degree from Memorial University of Newfoundland. Previously, she chaired the UW iSchool’s Master of Library and Information Science program, was a visiting researcher at Microsoft Research and a visiting professor at Oslo University College, Norway. Her ASIS&T activities include leadership activities in SIG/USE, service on the search committee for the JASIST editor and on the program committees for two Annual Meetings.

For more information about the candidates and their position statements for the offices they seek, please visit the ASIS&T website. All current ASIS&T members with voting privileges are invited to visit www.asis.org/elections/index.html for full information on the electronic balloting process.

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**ASIS&T Announces New Awards for Historical Study**

The advisory board of the ASIS&T History Fund, established by the ASIS&T Board in June 2000 to support and encourage research and publication in the history of information science and technology, has announced the establishment of two new awards: ASIS&T History Fund Research Grant Award and ASIS&T History Fund Research Paper Award. Both awards will be available for the first time this year.

The Research Grant Award will honor the best research support proposal submitted by September 1. All topics relevant to the history of information science and technology may be proposed. A maximum of $1000 will be awarded; all funds must be expended by August 31, 2010.

The Research Paper Award, maximum of $500, will honor the best paper submitted by September 1. Again, all topics relevant to the history of information science and technology will be considered.

The History Fund Advisory Board will review all submissions and determine if an award will be made. Members of the Advisory Board are **Robert V. Williams**, chair; **Michael Buckland**, vice chair; **Trudi B. Hahn, Ben-Ami Lipitz** and **Samantha Hastings**.

For more information on ASIS&T awards, visit the ASIS&T website at www.asis.org.
News about ASIS&T Chapters

**Gregory Hutton**, student in the School of Information Management at Dalhousie University, is the winner of the 2009 NEASIS&T Best Paper in Information Science Award from the New England ASIS&T chapter. Hutton’s paper, “Scientific Grey Literature in a Digital Age: Measuring Its Use and Influence in an Evolving Information Economy,” earns him up to $1000 to help defray costs of attending the 2009 ASIS&T Annual Meeting in Vancouver.

Jury members **Maureen O’Driscoll** and **Patricia Baudoin** noted that Hutton’s paper “is extremely well-written, providing good explanations for a very dense topic… [H]e describes his project clearly, packs a lot into a few pages and reaches a conclusion.”

News about ASIS&T Members

Three ASIS&T members will join the faculty of the School of Library, Archival and Information Studies at the University of British Columbia for the 2009-10 academic year. **Eric Meyers**, **Lisa Nathan** and **Aaron Loehrlein** will come in as assistant professors. Eric and Lisa, both graduating from the University of Washington, arrived on campus this summer. Aaron will complete his studies at Indiana University and join the staff in January 2010.

**Amanda Spink**, research capacity building professor of information science at Queensland University of Technology, has been appointed editor of the Emerald Library and Information Science book series, succeeding retiring editor **Bert Boyce** of Louisiana State University. The Emerald Library series publishes scholarly books on leading edge issues and broad research areas of library and information science.

**Amy Wallace**, formerly head of public services and outreach, California State University Channel Islands (CSUCI), has been named dean of the University Library. She succeeds Paul Adalian who has retired. In her new role she will guide strategic and operational planning for the library and seek innovative ways to foster information literacy, expand the library’s collection and maximize the use of technology. Wallace has been with CSUCI since June 2003. She previously held library positions at the University of California, San Diego; The Claremont Colleges; and Chapman University.

Thriving on Diversity: Information Opportunities in a Pluralistic World

November 6-11, 2009, Vancouver, BC, Canada

The 2009 ASIS&T Annual Meeting is fast approaching. Make sure you’ve marked your calendar. Check your mailbox for a printed version of the preliminary program; or go online for an electronic version. Registration forms are available in both formats. Make your travel plans now. We all look forward to a large crowd in Vancouver. See you there.
**PAUL WASSERMAN**

Paul Wasserman, professor emeritus and founding dean of the College of Information Studies at the University of Maryland, passed away May 8, 2009, following a period of ill health. He was 85 years old.

Wasserman took the post of dean of the School of Library and Information Services in January 1965, shortly after the school was formally approved. Beginning without faculty, curriculum or students, he built a new interdisciplinary school by recruiting an engineer, a physicist and an industrial psychologist, among others, to be the first faculty. By the time the first student graduated in 1966, the program was fully accredited by the American Library Association. He led the design of the doctoral program, which admitted its first students in 1967. He left the deanship in 1970 and returned to a fulltime faculty position.

Wasserman was well known for his contributions to library administration. He lectured and consulted internationally, frequently working on programs to educate library administrators in developing countries. He lent his professional expertise to projects in more than two dozen countries and was admired and respected by library educators and practitioners throughout the world.

Wasserman is survived by his wife Krystyna Wasserman, son Steven Wasserman, daughter Jacqueline Monroe and grandchildren. Cards and notes may be sent to the Wasserman family c/o College of Information Studies, 4105 Hornbake Building, University of Maryland, College Park, MD 20742.

**E. J. JOSEY**

E. J. Josey, library civil rights activist, administrator, author and educator, died on July 3 in North Carolina. He was 85 years old. Best known in the library world for his successful efforts to integrate state library associations and his challenges to ALA members to adopt policies and procedures that would improve the conditions for minorities in librarianship, he also held a series of prominent administrative and faculty positions at institutions around the country.

Josey was professor emeritus in the School of Library and Information Sciences, University of Pittsburgh. Before joining the Pitt faculty, he held several New York State government positions in library development. He also headed the library at Savannah State University; directed the library at Delaware State College; and served on the staff of Columbia University Library, Free Library of Philadelphia and New York Public Library.

A foundation has been set up to honor his life and work: The E.J. Josey Foundation for Justice and Peace, 526 West Second Street, Washington, NC 27889.
A Tonic for the Busy Troops
by Stacy Merrill Surla, Guest Editor

Work life is intensive! My time clearance for reading trade publications – always restricted – has been elevated to a need-to-know basis. Every conference session or local event I attend, every article or book chapter I ever get to read is permitted only in response to a pressing need to learn how to do something now.

Pulling together the articles for this information architecture issue was motivated by the same criterion. I wanted to find out who’s doing interesting, new IA work that very busy practitioners can use right now. At the ASIS&T IA Summit in Memphis I was able to attend a range of fascinating sessions and talk with the authors as well. As a result the articles in this issue all stimulate our thinking in useful directions, present practical problem-solving suggestions or both.

For instance, only days after the IA Summit I had a brainstorming session on my calendar to address “adding social computing” to the government portal we’re currently building at work. I was able to easily apply the guidance from Christian Crumlish’s “The Information Architecture of Social Experience Design” with the team. His framework and specific tips both accelerated and simplified our work and enabled us to draft recommendations on the spot for how we would proceed.

Some time after that we had an urgent need to craft a set of “tone of voice” guidelines for the same project. Colleen Jones’ “The Debut of Usable, Influential Content” provided an armature and specific direction for our content strategy.

In the coming months, as our project considers how to integrate mobile devices into its array of channels, we’ll refer to John Pettengill’s “An Internet Watered Down.” This work will allow us, for instance, to consider leveraging the unique geo-locational elements of web-enabled cell phones and other mobile devices. Similarly, as we design more interactive aspects of the site, Kellie Rae Carter’s and Dominic La Cava’s “Gaming the Design” will provide a strong reference for the smart and appropriate use of gaming tropes.

My two favorite thought pieces from this year’s Summit are captured in Kate Rutter’s and Miles Rochford’s articles. In connection with a website translation/internationalization project, I’ve already had the opportunity to refer colleagues to the slideshow of Rochford’s “IA for the Rest of the World.” The notion of numeracy as well as literacy as an important consideration enables IAs to better design for access by all. And Rutter’s “Lessons from Slime Mold” is simply brilliant. It’s a smart and funny treatise on how to – as the subtitle says – “survive and thrive in ever-changing organizational environments.”

Enjoy these articles. As I have done, you will find yourself using them in unexpected ways, in your projects… and in your cocktail party chatter.
Designing and building a successful social website or application is no mean feat. Adding a social dimension to an existing experience is trickier still. Nevertheless, the skills to do so are well worth cultivating, as the ubiquitous, pervasive, massively interconnected world of the Internet and allied digital networks, such as mobile SMS (short message service) connections, have unlocked a growing panoply of opportunities for social relationships, remote presence, real-time interactions and the capacity for self-organized groups of people to coordinate their behavior and collaborate on changing the world.

So when your boss, client, teacher or mentor drops a project on your lap and asks you to “add social to it,” where do you start? I’m thinking you start with the information architecture and in particular your conceptual models.

The pattern language that Erin Malone and I are working on (inspired by Christopher Alexander, Ward Cunningham, the Gang of Four, Jennifer Tidwell, Matt Leacock and Bill Scott, among others), describes patterns we’ve observed roughly sorted to focus on three major elements of our concept model: people, objects and relationships. Over several years, and with input from many people, we gathered a large list of potential patterns to investigate, and so far we’ve codified 96 of them, with 56 other principles and practices, and five major don’ts, classified as anti-patterns.

Christian Crumlish is the curator of the Yahoo! Design Pattern Library and the author of The Power of Many. He is writing a book called Designing Social Interfaces with Erin Malone. He is also a director of the Information Architecture Institute and co-chair of the monthly BayCHI program. He can be reached at xian<at>pobox.com.

Five Principles

Of the myriad principles we’ve unearthed so far, five cut across the entire experience:

- Pave the Cowpaths
- Talk Like a Person
- Play Well with Others
- Learn from Games
- Respect the Ethical Dimension

Pave the Cowpaths. Pave the Cowpaths means, essentially, look where the paths are already being formed by behavior and then formalize them, rather than creating some idealized path structure that ignores history and tradition, human nature, geometry and ergonomics, and common sense. Sometimes this principle is applied on campuses – and sometimes a rear-guard “keep off the grass” action is fought instead to no avail.

In the design of social interfaces, this rubric has two applications. The first is simply to do your ethnographic homework – study some of your potential customers. How do they do what they do today? Yes, of course, the thing you want them to do will be better, but is it really entirely different? Can you offer people a way to continue doing most of the things they’re comfortable doing today as you introduce new possibilities into their lives, or are you really going to insist on them changing everything at once?

The second application of Pave the Cowpaths comes later in the lifecycle of your site, when you’ve got a user base and they start doing things you never anticipated. Often the impulse is to stamp out these rogue behaviors and
enforce draconian rules requiring only the behaviors you had planned for. This course of action really only makes sense if the behaviors you are trying to stamp out are truly destructive or evil. There are many anecdotes about thriving social sites that killed themselves off by legislating against fun and forcing their users into exile to find the activities they had been improvising “incorrectly” in the site they had to leave.

A better plan is to support the behaviors your users are engaged in. Let your users tell you what the best and highest use of your interface may turn out to be. Don’t be so arrogant as to assume you know everything about how the social dynamics you’ve unleashed need to evolve.

**Talk Like a Person.** When many of us started putting together personal sites, art projects and other creative or informal objects starting in the 1990s, the air of informality online was palpable, but when business came online a bit later in the decade, many of the first business-oriented websites reproduced the remote, inanimate, almost robotic corporate voice you tend to find in annual reports and catalog copy.

Even there, the more savvy enterprises appreciated the value of communicating to potential customers in a human voice. The corporation has always been a mask that disguises the human nature of the people who do the actual work of the business. Revealing the humanity of the people at the other end of the wire has a softening and welcoming effect.

Sure, there are still times where great formality and even perhaps distance are useful, but in an age where authority emerges from collaboration rather than by being handed down from on high, the remote, formal, stylized tone of printed communications is continually in the process of giving way to a more natural, conversational tone.

This is all the more true in the context of social sites. If a website does not communicate from the get-go that it is peopled – and written – by ordinary human beings, how will people ever feel comfortable there? The antiseptic air of a hospital or the bureaucratic formality of the department of motor vehicles is no environment for fostering connections, relationships or collaboration. Bear in mind that the writing on your site or in your application is a key part of the user interface (UI). Call it web copy, nomenclature and labels if you like, but it’s as much a part of the UI as the buttons, windows and sliders.

**Play Well with Others.** Carry out this principle by designing an architecture that’s as open as possible, in particular:

- Embrace open standards
- Share data outside of the bounds of your application
- Accept external data within the sphere of your application
- Support two-way interoperability

To be clear, we’re not religious about any of this. If a proprietary protocol, technology or model works best for you then use it in good health, gain whatever benefits you get, but be aware of what you may be giving up in exchange. Where possible, though, we’ve found that the more you can build your app upon the rock of proven, well implemented, open standards and technologies, the easier it is to participate fully in the social potential of the web and the always-on digital environment we now live in.

**Learn from Games.** The intersection between game design and social design is opening up new possibilities for social experiences in game environments and introducing playful elements to social interfaces. An application doesn’t have to literally be a game or be presented as a game to employ many of the same design techniques that make games fun to play.

It’s no coincidence that Ludicorp’s first product was something called Game Neverending (their second was Flickr, which owes at least some of its success to the almost addictive game-like quality of its user interfaces).

Even in the enterprise, interfaces don’t have to be dry and tedious. Think about how to delight your users and encourage them to engage with each other.

Games are among the oldest social interfaces. The rules and tokens of a game provide a set of affordances and an environment in which people interact. In fact, people will make up their own games with whatever elements they find handy. Many of the memes that spread on sites like LiveJournal, blogs, MySpace and Facebook (“Which Buffy Character Are You?” “37 Things You Didn’t Know About My Cat” or “iPod Shuffle Ouija”) utilize built-in posting, commenting and polling features, which
isn’t to say that you couldn’t encourage your users to invent games for each other by giving them generative tool with which to do so.

**Respect the Ethical Dimension.** When you are designing experiences for people or designing frameworks within which people will create their own experiences, there is always an ethical dimension. What commitments are you making explicitly or implying when you open your doors for business? Are you promising to keep people safe, to keep their information secure or to respect their privacy? Are you willing to bend ethical rules to cheat your way through the cold start problem and rapidly build your social graph?

Balzac once wrote, “The secret of great wealth with no obvious source is some forgotten crime, forgotten because it was done neatly,” and many successful social sites today founded themselves on an original sin, perhaps a spammy viral invitation model or unapproved abuse of new users’ address books. Some companies never lived down the taint and other seems to have passed some unspoken statute of limitations.

**Five Anti-Patterns**

You’ll find that some of the forces that must be balanced to apply many of these patterns involve ethical dilemmas. Is opt-out good enough? Is this disclosure adequate? Is it your responsibility to stop the bullying? The five anti-patterns:

- Cargo Cult
- Don’t Break Email
- The Password Anti-Pattern
- Ex-Boyfriend Bug
- Potemkin Village

Briefly, the Cargo Cult means imitating superficial features of successful websites and applications without really understanding what makes them work. Don’t Break Email warns against the practice of using email as a one-way notification or broadcast medium while disabling your users’ ability to hit reply as a normal response. The Password Anti-Pattern is the pernicious practice of asking users to give you their passwords on other systems so that you can import their data for them, thus training them to be loose and insecure with their private information. The Ex-Boyfriend Bug crops up when you try to leverage a user’s social graph without realizing that some of the gaps in a person’s network may be deliberate and not an up-sell opportunity. Lastly, a Potemkin Village is an overly elaborated set of empty community discussion areas or other collaborative spaces, created in anticipation of a thriving population rather than grown organically in response to their needs (see also Pave the Cowpaths).

**A Pattern Language Framework**

With those major principles and caveats in mind, consider now the following pattern language framework. You could almost consider it a meta-information architecture – a taxonomy of patterns that can be selectively recombinated and implemented to create new social information architectures that learn from the best of what has come before. The framework has three major buckets: concepts of the self, activities around objects and relationships and community dynamics.

**Concepts of the self.** Patterns in this cluster deal with how people inhabit the social space, represent themselves and appear to each other:

- Engagement (patterns for invitation and signup)
- Identity (profiles, avatars, user cards)
- Presence (availability, status, activity streams)
- Reputation (levels, labels, awards, points)

**Activities around objects.** Patterns in this cluster involve the activities and interactions that people engage with around social objects. Without objects to congregate around, social networks can end up becoming static lists of connections. These objects include the following:

- Collecting (bookmarking, tagging)
- Sharing (sending, sharing, gifts)
- Publishing (broadcasting, blogging, right)
- Feedback (rating, comments, reviews)
- Communication (forums, public conversation, private conversation)
Collaboration (governance, getting work done)
Social Media (tuning, filtering, real-time search)

Relationships and community dynamics. Patterns in this cluster involve connections between people and among larger groups of people and coordination of events in space and time. They include the following:

- Connecting (reciprocity/symmetry, followers, adding friends, publicizing relationships)
- Groups (group formation, moderation)
- Community Management (norms, role models, community governance)

Place (being local, geo, scheduling)

Other factors you’ll want to consider include context (recreational, enterprise, government?), and demographics (boomers, elderly, youth?).

Conclusion

Obviously, this discussion is just an overview, but you can delve into any of the patterns in this collection on the web at http://designingsocialinterfaces.com/patterns.wiki, or you can wait for our book, Designing Social Interfaces, coming from O’Reilly in September 2009.
What happens when we architect a user experience that makes the content easy to find? The content becomes a focus of the experience, a star of the show. If the content performs well, it will have an influence. Users will be more likely to take the action we want them to take, make the decision we want them to make or have the perception we want them to have. Users will be more likely to consider our brand, our product or our idea.

Yet we do not treat content like a star. We treat it like an extra, at best. What is more, after years in the trenches of designing interactive experiences, I have found that user experience (UX) professionals and interactive marketing professionals push for opposite content extremes. UX professionals try to ensure the content is usable. A few characteristics of usable content include being findable, scannable, readable, concise and layered. The problem is that content can be usable but not influential. Consider the Holiday Inn page (Figure 1). All of the right information about the property is available, but it is not compelling.

Interactive marketing professionals try to influence, sometimes with little regard to usability. In the Victoria’s Secret example (Figure 2), a layer promoting tank tops slides down the screen and disrupts the checkout experience. The user is trapped and cannot move forward in the process without closing the layer.

Clearly, we need balance.

In addition to solving this practical problem, now is the time to consider influence for several strategic reasons.

1. **Tough economic times call for being aggressive – in the right way.**
   Now is the time for our employers and our clients to speak effectively to users about differentiators, benefits and care for customer satisfaction. Now is the time to show customers appreciation for their business. Now is not the time to bombard users with obnoxious, disruptive ads.

2. **Content (not technology) is a social actor.**
   In the book *Persuasive Technology*, B.J. Fogg identifies social actor and creating a relationship as one way technology persuades. [1]
   I argue that usually the technology itself is not persuading. The content is. A computer, website or mobile phone delivers the information to a user at the right time. But the content ultimately has the influence.
Moreover, we live in an age of automation and self-service. [2] Interactive experiences are taking the place of or augmenting in-person experiences. Interactive content is taking the role of customer service representative, sales representative, concierge, tech support and more. Content needs to speak and act in the way an organization’s best customer-facing representatives do. Sadly, content often speaks like an organization’s duds, not its stars.

3. Analysts are talking about it.
In the business world, analysts have recognized a problem – companies pay too much attention to managing content and too little attention to crafting it. The Forrester report *Use Persuasive Content to Improve the Customer Experience* puts it this way:

> We “…can drive significant improvements in customer experiences. How? By putting more emphasis on using content to help customers – whether it is providing relevant information when customers buy a product or delivering easy-to-use and understandable content for customer self-service websites – rather than simply focusing on how to create, manage and search for content.”

So how do we make content influential? First, a definition is in order. Merriam-Webster [3] defines influence as “the act or power of producing an effect without apparent exertion of force or direct exercise of command” (p. 59). Our content can subtly yet powerfully produce the effect we want so that we do not have to resort to force tactics, as Victoria’s Secret did. Based on my experience, I offer three key tips below. For more tips, please see the slides from the IA Summit 2009 presentation. [4]

1. **Talk like a person.**
This tip sounds simple. Yet I am amazed how time and again content reads as if a content management system regurgitated. Take, for example, the main content from a product page of a major online retailer (Figure 3). At a glance, the content appears usable. It even uses bulleted lists. However, if read, the content repeats itself and is an incoherent mash of features, benefits, specifications and product numbers.

[figure 3: An incoherent mash of information]

Content is a social actor, so it needs to sound human. It needs to reflect care, enthusiasm and emphasis. Above is a product page with content that does just that (Figure 4).

2. **Use the right tone.**
Tone imbues content – and consequently the user experience – with a
flavor or feel. Tone is important to conveying a brand or organization personality. Bliss, for instance, demonstrates a distinct personality through the content’s sassy tone (Figure 5).

3. **Appeal to the left and right brain.**
   Ever since Aristotle, we’ve known the importance of appealing to logic (logos), emotion (*pathos*) and credibility (*ethos*). For example, the Gotvmail home page (Figure 6) appeals to logic through pricing, to emotion through a branding message and testimonial, and to credibility through partner logos, award logos and “featured in” logos. The result is a powerfully persuasive mix of content in a compact area.

Achieving these tips is impossible without giving content care. If we continue to treat content as an extra to information architecture, to content management or to anything else, we miss a bright opportunity to influence users. Content is not a nice-to-have extra. Content is a star of the user experience show. Let’s make content shine.

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**Resources Mentioned in the Article**

An Internet Watered Down
by John Pettengill

We live in a world of cords and keypads. Every experience, from getting lost to doing laundry, is benefitting from the gadgets that fill our lives. And people have benefited too, as we are more connected now than we ever were before. We can speak to family living in Munich and coworkers in Beijing, all from our desk chairs in New York. We’re so wired that our connectivity isn’t just taken for granted, it’s passé. But while everyone may be wired, none of our things are wired together.

The gaps in our daily experiences can be found all over, in our homes, our offices and stores. Information that can be found online is divorced from the cold, hard reality of the flesh. But a Mobile Web could bridge all of these gaps – giving us the information and tools we need, where we need them most.

The Problem

So why haven’t we exploited the Mobile Web’s potential?

The web isn’t a local tool. From the early days of the BBS to these days of 4chan, the web has worked to bring together people that distance separated. The World Wide Web has become an all-encompassing symbol for connecting people and for letting remote voices get heard. In fact, what we now know as the Internet started as a tool to enable remote lab teams to share research. Once we had accomplished that, it was a backhand thought and a regression to make the World Wide Web a local one. Communities like Craigslist have been drawing cities closer since 1995, effectively replacing classified ads. And sites like Yelp are giving the yellow pages a serious run for their money with in-depth reviews for community businesses. Websites providing local content have drastically improved upon their real world alternatives. Quickly filtering to a custom list of businesses or finding user reviews are two things that were effectively impossible to do using the old standby, the yellow pages.

It’s painfully clear that these websites meet a user need. But that doesn’t make them the Mobile Web. Mobile-optimized versions of these websites aren’t part of the Mobile Web either. While the information they host may be local, the way it’s presented is not. We’re just offering users the same old Internet that features broad content and powerful (but general) functionality. An Internet that just doesn’t work, fit or make sense on a phone.

Phones aren’t computers. Your phone is not the same thing as your home computer. This sounds basic but there are hundreds of mobile websites that prove how we don’t understand this yet. Your home computer has a large display, a full-sized keyboard and a fast connection. As a result, the Internet is sloppy. Its pages are crammed with buttons, panels and tabs. Meanwhile, all those features aren’t stopping us from opening five different windows as we try to do five different things five different ways. Your phone lies on the opposite end of that spectrum, with a small screen, a tiny keyboard and a much slower connection. Everything about our phones reinforces the fact that the mobile Internet cannot be sloppy. The phone is most effective when performing specific tasks, surgically executing them one by one. But if these two devices are so different, why are we giving our users the same Internet? Watering down the Internet by reformatting content to fit onto a small screen isn’t enough anymore. We need to rethink this problem entirely.
**Time to make a change.** It’s no lie that content works on a cell phone. That’s why applications and mobile sites for sports, news and social networking are so popular. But that’s not the point. We have powerful, location-aware “communication holy grails” with us all day long, and we’re using them to play Sudoku and read the *Times*, effectively wasting ours. We’re filling life’s dead space with the most powerful tool to ever hit the streets. Mobiles have become our book, our radio and our Nintendo. But we’re repeating categories when we could be forging new ones. We need to move mobiles away from the dead spaces and back to real life. Accomplishing this translocation by addressing real world needs in a new way will forever change our daily interactions and ultimately prove the important place mobiles will have in our world. We need to stop formatting content and start providing functionality.

It’s been a long road, and we have finally realized that the mobile space is changing. But most businesses don’t understand what that means yet. They’re still asking us for the same watered down websites. But let’s do them one better. Let’s hyperlink the world with a functional Mobile Web and make their *mobiles* their *mouse*.

**How Our World Will Change**

Things are sloppy here in the real world. It takes three remotes to control your TV, we lose instruction manuals and warranties and we constantly have to learn how to operate new devices. These are challenges that could be quickly solved if every person had a consistent digital experience, a pocket-sized personal computer. Apple can be seen moving in that direction, as they really do have an app for just about anything. But these surgical tools are still isolated from real life, siloed together with the computer. Eventually physical spaces will have special apps that can be pushed to your phone, and you the user may elect to take advantage of that new digital layer. Because mobiles have geo-intelligence, they can tell us where they are. And that clarity of geography informs not just where the user is, but what she is doing. So at last, we finally know something about our users! We have an opportunity and an obligation to give users functionality that takes advantage of that. We can address the unique needs that arise at unique locations. No longer will users have to pile drive through the whole of the Internet or through sites geared towards users from everywhere. No longer will they wait in lines or try and track down sales associates. The Mobile Web will use a series of tailored, location specific apps to change our world.

**How we acquire content.** Apple and Starbucks have already teamed up, proving to us that a location specific Mobile Web is on its way. When iPhone or iTouch users visit a Starbucks café, they can find in their iTunes app a new button labeled “Starbucks.” Once selected, this button shows users the song currently playing at that Starbucks, along with other recently played songs and Starbucks-promoted playlists. Users can then choose to purchase any song they hear, finally bridging the gap between hearing a song that they like, figuring out the artist and song name, and having the means to purchase that song themselves. Users are given timely information and the tools to act on it.

Apple and Starbucks accomplished this linking without Near Field Communications and without GPS. All they needed was a Wi-Fi router and a willing device. So no more excuses.
The way that mobiles fit into our lives is changing and huge opportunities are there to be seized because of it. As I write this I eagerly await a world where iPhones support Bluetooth connections to accessories. Soon we will have one remote for our lives, be it our G1, Pre or Storm. Calling our phones “phones” will be as lacking a description as calling our homes “hovels.”

**How we shop offline.** The website for Barnes and Noble does everything it should. It allows users to search for books, and it also presents new or popular books that users might be interested in. The site, in a word, is useful. But it isn’t useful everywhere. When users are at a Barnes and Noble, that perfectly good website, mobile optimized as it may be, is useless.

The primary tool you’re awarded when you search for a book from your mobile is an “Add to Cart” button. The website is clearly still treating you like you’re stationary, stuck at home. It isn’t showing a map of the store or even featuring store events as a navigational item. You can’t preview music using the in-store Wi-Fi or order a refill for your latte. This exciting layer of
functionality that could be added to the store’s physical space is woefully absent. But empowering users through such a personal channel could inspire loyalty and fill all the gaps that store associates cannot. The brick and mortar building, lacking in personal tools and serendipity, could inform and surprise users in a way that no one has ever seen.

What’s Next?

I’m not saying that your mobile is some kind of magic wand. But, then again, I guess I am. Your mobile is your tool and translator for accessing the hidden world of information that is lurking all around you. It’s a digital magician’s assistant, allowing you to interact with your world on a deeper, much more personal level. The Mobile Web, informed by your location, will give you hyper-specific tools with which you can control and affect your world. Retail stores can offer powerful mobile brand extensions, giving users a playful way of both discovering and getting things done. One of the only existing top-down examples of the Mobile Web was executed at Starbucks. This circumstance reinforces the opportunity and important role that powerful chains have in exposing the Mobile Web. Apple’s App Store also illustrates how important specificity is in application design. Simple single-purpose tools like UrbanSpoon are the crowd favorites.

It has become clear that the world is changing. In mere decades the mobile phone moved from being an extravagant absurdity to a ubiquitous necessity. But the world won’t stop there. Our phones are becoming powerful enough that if we can dream it, we can build it. The Mobile Web is the network that will provide the right tool when you need it. We cannot give our users watered down websites. We have to stop guessing what our users want to do and instead focus on where they are doing it. Location, location, location, as they say in business, is the key.

This article is based on a presentation delivered at the 2009 IA Summit, which can be found at www.slideshare.net/johnep/an-Internet-watered-down-or-how-to-save-the-mobile-web.
Gaming the Design: Using Game Design Techniques in the Realm of Investing
by Kellie Rae Carter and Dominic La Cava

The use of aspects of game design in the design of other types of interfaces has increased as designers try to use the best design practices available, including those from outside their own disciplinary backgrounds. However, this borrowing from other design theories and philosophies can complicate the design process, particularly if not done thoughtfully and with an eye toward improving the user experience and meeting users’ needs. The following is a case study on how one design team used game design techniques to inform the redesign of a transactional web task: opening a financial account online.

In the spring of 2007 our design team was tasked with the redesign of the process through which clients opened new accounts. Titled 27x, this project was a redesign of the money movement transaction at Vanguard. The intent was to reduce the average number of steps (27) of Open an Account (OA) down to an appropriate single number of x. The current serial process can take users anywhere from 17 to 80 steps depending on asset type, account type and funding method.

The 27x design team’s goals were to understand the issues and dependencies around moving money to and within Vanguard and to engineer a solution, resulting in an innovative and intuitive user interface and a dynamic user experience. The design paradigm the design team employed focused on creating a dynamic user interaction on the back-end through mapping dependencies in the process and in the user interface by utilizing design principles from games.

Considering the vast amount written about game design, play theory and psychology, this paper will focus on how games capture players’ attention and place them in an immersive environment where they tend to spend hours playing and engaging in the game’s story. Gamers can spend between 12 and 30 hours a week, with an average of 45 minutes to 4 hours a day, playing video games [1, 2]. These statistics consider an aggregate of ages, children to adults, and gender. The interactive nature of games entices users to play by creating an environment in which, as players complete their tasks and progress through the game, they become engaged and gratified in knowing they are moving toward their goal. This feeling of reward encourages players to invest their time in games and to return to game play day after day.

In looking to game design, we had to understand and address a contradiction between our design goals and the design goals of games. Games are meant to keep people playing, while our goal was to significantly reduce the number of steps it took for a user to complete the open account process. So while a successful game is measured by the time and investment that people put into game play and the simple idea that the longer users play, the better the game is, we had the task of reducing the time users spent trying to navigate our screens. But while we realized that the goals might be contradictory, we also realized that games could provide us useful avenues...
for design. Games use a variety of interactive and immersive techniques to create a play space, techniques that can be useful to designers of more work-oriented or transaction-based interactions. How, then, given this contradiction in goals, do we borrow from the field of game design for the design of other types of interactions with the intent of improving the overall user experience? We hope our use of game design techniques in the 27x project will prove to be illustrative.

About the Design Problem

We quickly realized that the process of opening a new account can be complicated for users because the current serial process presents information and steps in a vacuum: the context of a particular decision can be difficult for a user to grasp. In other words, the step-by-step process obscures the vision of the whole. Further complicating the user’s task is the fact that the current OA process does not react to user actions in a helpful or meaningful way. Users found the serial process “confusing,” “too long and tedious” and “difficult to navigate.” As one user explained, “I really hate your website. It’s non-intuitive, filled with trap doors, and you are forced to go down paths without knowing what the requirements are for adding funds and setting up accounts.” [3]

Figure 1 is a screen shot of the first page of the open account process we were redesigning. It provided a puzzling array of choices for users. It did not leverage user input to streamline the process and did not support user decision-making.

The current design lacked an intuitive field of action that responded to user inputs and provided a meaningful context for decision-making. So we looked outside the current practice in task-based designs to game interfaces, particularly children’s online games, which tend to be immediately intuitive and actionable and which use space and movement to focus and engage the audience. But we also used clearly designed strategies and goals to guide the process of incorporation of game techniques and to keep us focused on the user experience we were trying to provide.

The design goal was to provide a user experience that mitigated the complexity of opening an investment account by streamlining the task flow and eliminating tedious information gathering. Given that the task domain includes a number of account types and the complexity of investing, the design team aimed to orient users to their overall goal without the interference of redundant or unnecessary tasks and to provide a sense of working toward a final state of closure. In order to do this, we needed to place users immediately into the activity context and to provide a design that was intuitive and actionable from the onset. Thus, the goal was to reduce the time and number of steps to perform the task while providing an environment that was comfortable and inviting. The design team found that some techniques from games helped accomplish these goals, particularly the use of a single-interactive page to simplify the user’s experience and build context, the use of animation and movement to provide focus and the use of graphics to tell the interactive story.

Design Goal 1: Simplify the User’s Experience

Users who feel overwhelmed by the number of options offered at a given decision point frequently respond by opting or canceling out of the selection process altogether. Barry Schwarz’ study The Paradox of Choice: Why Less Is More [4] provides copious support for the principle of simplifying choice by reducing the number of options provided. The “parsimony principle” should be followed whenever possible to help reduce choices, focus the user’s attention and guide him or her through any selection activity.

With our goal of simplifying the user experience, we looked to games to help us envision a simple interactive space that would support a complex decision-making process. We noticed that many children’s games are immediately intuitive despite an array of options. For example, in the game Dora the Explorer: Dora Saves the Farm [5], the rules of the game are
established by audio and graphic cues. Considering that most of the intended players may not be able to read yet, text is absent from the game. Instead, the metaphor of a barn on a farm is immediately established through the use of graphics, as all elements of the game are immediately visible on the screen. The game displays animal images that players intuitively understand and know that they will have to interact with. It creates a sense of curiosity, compelling players to see why they are hiding. The game design establishes this curiosity before Dora even explains the rules. There are no elements to drill down into to understand game rules or to progress to the final state. The design invites players to interact with the screen and learn the fundamentals of the game by doing, by immediate immersion in the interface.

One of the reasons for this immediate ease of use is that the options are all grouped and surfaced on the screen so they are easy to access and view. The single-page interface utilized in these games connected the interaction narrative with the control space and provided a visual gestalt that allowed users to immediately grasp the overall structure and interaction. We know from Gestalt psychology that people attain a visual comprehension of a page quickly. A page that has good information and visual design, good use of grouping and clear hierarchy, for example, can begin to tell the story (like how many pieces of information a person has to comprehend) and establish pertinent relationships (like which pieces of information are subsumed under main topics).

Children’s games utilize these techniques well; they present spaces that are easy to comprehend and take action in. We used these as inspiration in our design. First, we grouped the information users had to provide into the primary buckets that make up an investment account: where the money is coming from (the method), the tax structure and ownership information (the account) and the investment vehicle (the investment). We placed these three grouped informational points onto a single screen. The single screen interactive space helps users to see the whole of the task. Visually, they can see that there are only three main completion points, similar to how many games set up a screen with a clear path, target and goal, like the arcade classic Donkey Kong. Nothing is hidden – the path, the obstacles and end point are all on display in a visual field. Our first step toward simplification, then, was to show the interaction narrative in one space so users could conceptually grasp the information needs and path toward completion.

Our next step was to simplify in ways that users couldn’t necessarily see. In Rules of Play [6], Salen and Zimmerman discuss meaningful play in game design as one that offers meaningful choice within a responsive system. They write: "In order to create instances of meaningful play, experience has to incorporate not just explicit interactivity, but meaningful choice. When a player makes a choice in a game, the system responds in some way. The relationship between the player’s choice and the system’s response is one way to characterize the depth and quality of the interaction" [6, p. 61]. This interactivity seems like a simple idea; if you are playing a game like Resident Evil, and you shoot a zombie, the zombie should die. Otherwise, actions have no meaning and the game play interaction is not particularly fun.

However, in the open account process we were redesigning, we realized that user choice was not leveraged in the interaction or particularly meaningful. The system didn’t use user inputs to change the game and provide quality interaction. However, in designing 27x, we realized that many user choices could streamline the subsequent flow. For example, if the user selects Rollover IRA as the funding method, then we can remove non-IRA account options from subsequent screens, like Joint or General Investing. We decided that the application needed to be smart enough to recognize dependencies between different activity areas within the transactional process, and the user should be presented only with currently applicable information, rather than generic or irrelevant information.

Our behind-the-scenes simplification work, then, was to make sure we utilized every bit of information we had on hand and mapped dependencies so that users were only presented with choices they had to make, not generic screens that gave all choices to all users. So we leveraged user choice within the OA application to eliminate steps and questions that were not important to the task at hand. But we also went further, beyond the set of screens we were designing. We realized that we had a wealth of information about users depending on where they entered the process. For example, if users entered the process by clicking “Invest Now” from a specific mutual fund page, we knew which investment they had chosen and we could pre-fill that information.
and move them several steps down the path toward task completion. The same thing applied if they selected an option to “Open an IRA.” It was our job to ensure that the system recognized and responded to dependencies by tracking previous selections and leveraging backend rules engines to filter out irrelevant options based on both previous selections and the overall transaction context.

**Design Goal 2: Use Visual Metaphors to Lower the Learning Curve**

Games are, of course, heavily visual. In the children’s games we looked at, the imagery provided an intuitive space for players. In *Dora the Explorer: Dora Saves the Farm*, all the objects that players interact with are animals, common objects from players’ lives or books. The images are intuitive because they leverage existing, non-interface knowledge to bring users into the design. The animal images are large so players can easily find their target and click on the image to complete the task and to achieve the goal, which is to move the animals to the barn door. These large animal images are inviting and attract players’ attention immediately. As players interact with the screen, the game responds to each user action, such as highlighting the image as players mouse over them, while also providing feedback for positive or negative actions. For positive results, the game gives audible and visual feedback, including encouraging responses from Dora, making the appropriate animal sound and animating the graphic to move toward the barn door. For negative results, Dora states that the choice was not correct as the graphic makes the appropriate animal sound.

The games provided intelligible and easy-to-grasp interactive objects familiar to players. However, children are not the only ones who can use visual metaphors, as we all know. As Stephen Utkus of the Vanguard Center for Investment Research noted recently [7], “Visual learning is more intuitive and often faster than cognitive learning.” His presentation included several compelling examples of how visually imagery can impact choice behaviors and open up new avenues of affective communication. Because the investing task domain can be difficult and because most investors do not open new investing accounts often, we sought to leverage visual metaphors to help tell the story of investing.

Metaphors facilitate users’ understanding of moving money while also providing an intuitive interface for users to interact with in accomplishing their tasks. It was very important to apply a metaphor that reflects the majority of users’ mental models for moving money. The visual design was meant to improve the overall user experience for, and provide education about, moving money to and within Vanguard. The 27x concept employed icons and visual metaphors to educate users on the relationship between key investment concepts (such as accounts and investments) and help them adapt their mental models to the industry’s business model as well as to Vanguard’s specific approach to money movement transactions.

Figure 2 is a screen shot of one of the prototype models. This example shows how we leveraged icons in the design, provided task completion feedback and task-specific help and used the single-screen design to provide focus. The task areas rotate around until the user provides all information.

**Design Goal 3: Animation and Movement to Provide Focus**

In providing a single screen without the typical jumps between pages to signal movement and progress toward completion, we knew that we had to guide our users through the interaction in a different way. Novice investors often find it difficult enough to comprehend complex investing concepts and relationships, and this difficulty is compounded by inelegant handoffs or transitions between different segments of a serial process. The task domain of investing should be users’ focus, not navigation through the interface. Thus, to keep users from dropping out of a transaction, special care is needed to signal and prepare users for any necessary transitions or handoffs.
But we also didn’t want to clutter the screen with all data points surfaced in the dependency mapping we had done. Such a display would be an inelegant way to design for user choice. The 27x design attempted to provide a clear focus for users during each activity state by ensuring that only information that is immediately relevant to the current task displays in the visual field. We needed to have a way to keep a user focused on a specific area and then shift focus after that part of the process was complete. Here again we looked to games. In any first person shooter game, the field of vision provides the view of the interactive space. Players move through this space, alert and watching, and often it is a movement of an object that draws their interest and focus.

One of the most immersive aspects of games is movement: both movement through an interactive space and movement to help players focus on the important areas of the screen. Movement and animation engage and direct the play, smoothing handoffs and providing focus by utilizing natural experiential responses. One part of game experience, as Salen and Zimmerman explain, is apprehension [7]. Apprehension helps immerse players in games by drawing on a heightened sense of awareness and watchfulness of objects on the screen. Movement in this visual field gives players something to focus on and respond to in the game play.

We sought to leverage movement in our design as well, albeit in a much smaller way than an immersive game. The design leveraged animation effects to signal and smooth transitions between steps and between the three main informational buckets of the transaction (Investments, Account and Method). Upon completion of the investment path, for example, the screen where users had been entering information shrank, a green checkmark appeared by the icon and the next set of screens opened so users could continue on in their task.

Conclusion
The design team approached the task of opening an investment account as an example of complex problem solving. In her book Interaction Design for Complex Problem Solving [8], Barbara Mirel highlights the tension between textual description and static visual representation by exploring differences between Tolstoy’s textual description of battleground decision-making (in all its muddled, contradictory, in-the-moment complexity and storytelling) and Minard’s graphic representation of Napoleon’s Russian campaign of 1812. She points out neither the purely textual nor the purely visual representation worked to tell the full story. She links this tension to design teams’ challenges in getting both the interface and the user’s story correctly. One way to resolve some of these issues, she argues, is to look to other visual and story-telling media, as the 27x design team did. She writes,

[A]nother way for HCI specialists to merge investigative stories with data meanings in applications is to give users ample interactivity to explore, set courses, shift perspectives, and configure investigative plots as needed. Toward these ends, analogies with other visual media such as movies and the interactive narratives of computer games can offer software teams guidance. Both genres have an overarching concern with visually presenting action and problem solving through the lens of story, context, and meaning. [8, p.xxxviii]

In trying to create the 27x interface, the design team established a set of user-centered design principles that this interface had to live up to. This allowed the team to keep their attention on the user experience, particularly the user’s story or journey, as well as focus on the key interactive aspects. However, that is not all the design goals did. They also helped guide the incorporation of game design techniques into the overall design and resolve the contradiction between the goals of games and the goals of a transaction process. We couldn’t borrow wholesale from game design; our goal was not to have our investors play the investing game all day. But at the same time, we knew that some techniques could provide us with inspiration and help in solving some of the problems we wished to solve through our design. Throughout the design process and multiple iterations of the 27x prototype, the design goals we established early in the process served as a touch point and a check to the use of game design techniques. We were careful not to get too caught up in the fun of borrowing from games that we forgot the important user needs and goals we were trying to meet.
### Resources Cited in the Article


3. User comments from project interviews and usability tests


5. *Dora the explorer: Dora saves the farm* – www.nicksplat.com/games/dr_farm/


IA for the Rest of the World

by Miles Rochford

Note: All opinions expressed in this article are those of the author and do not necessarily represent the official view of Nokia.

As designers, one of the greatest challenges we face is designing for other people. It is remarkably easy to design for oneself and infinitely more challenging to design for others. Like me, you are probably experienced in designing for others in your own world – likely a Western country, in a large city, with high quality information infrastructure.

So when the call comes in and you find out that you need to design for the rest of the world, you are immediately forced to leave your comfort zone as a designer. All of a sudden, your experiences and assumptions are no longer relevant, and you need to understand a different design context. This new challenge may even require you to leave some personal comfort zones behind.

The Rest of the World

When I joined Nokia Design, I realized that I was going to be out of my depth as a designer, purely because of the global reach of the company. At the same time, this aspect was one of the things that attracted me to the opportunity.

So when I did receive a call last year, inviting our team to be involved in service design for emerging markets, I jumped at the chance. We were asked to help in the research and design of a new service (publicly announced last November) called Nokia LifeTools. Our focus was on understanding consumer needs in a range of countries including Egypt, Brazil, Nigeria and India.

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The term emerging markets was coined by Antoine van Agtmael in the early 1980s when he was working for the World Bank’s International Finance Corporation. There are many competing definitions, but all generally classify countries or regions into three types – for example, advanced, emerging and least developed. But this classification is by no means universally agreed – some consider South Africa, Brazil and Saudi Arabia emerging markets. As such, emerging markets tend to be diverse, and although they share some characteristics, the way in which these characteristics are expressed varies widely.

In general, though, there are several things that I have seen emerging markets doing:

- Urbanizing – This trend is perhaps the strongest one across all emerging markets, with hundreds of millions of people moving to existing cities to seek wealth and opportunity.
- Growing – Growth has slowed as a result of the global financial crisis, and capital inflows to emerging markets have stalled, but growth is still a major part of their economies.
- Westernizing – This particular feature varies from country to country, but in general terms, adoption of Western approaches has focused on those areas relevant to trade including legal systems, economic structures and education (especially languages).

As a result, there are many opportunities for designers. The scale of emerging markets is staggering – both India and China have more people than the United States and Europe combined; indeed, three-quarters of the world’s 20 largest cities are in emerging markets.

But beyond sheer numbers, there is a huge potential to have a meaningful impact on peoples’ lives. Enabling people to maintain their livelihood and improve their lives is a rewarding outcome from a good design. Of course,
the impact could be positive or negative – perhaps a frightening possibility for a designer – but it is a possibility rarely seen in developed markets.

The way in which emerging markets are embracing change is also an opportunity for designers. The rate of change in developed markets is relatively low, unlike emerging markets (although this factor varies widely, especially between cities and rural areas). Embracing and enabling change is a strategy that can lead to real innovation.

Of course, there are many challenges in emerging markets, most of which have been difficult for developed markets at some point in their history.

Infrastructure, particularly electricity and telecommunications infrastructure, is often unable to handle the scale of growth and change and frequently fails to deliver what is needed. Of course, people adapt – for example, phoning ahead to see if there is power and that their employer will be open – but the lack of infrastructure is a limiting factor.

Education is an ongoing challenge, particularly in terms of literacy and numeracy. There are more than one hundred million children who do not have access to a basic education, and although access to education is improving, it is nowhere near the universal opportunity seen in most developed countries.

Finally the environment, particularly health, resources and sustainability, is a constantly changing issue – affecting individuals, corporations, countries and the world as a whole. There is a greater appreciation of environmental impact in countries where the effects of climate change are already being seen – in Bangladesh, with rising sea levels impacting agriculture, for example.

IA in Emerging Markets

At the ASIS&T 2009 IA Summit in Memphis last April, I shared eight observations from my work in emerging markets to help designers understand some of the challenges and opportunities that they present:

1. **People rich, time rich, money poor.** Emerging markets have few shortages of labor (especially unskilled labor), and where labor is underutilized, no shortage of time. This balance tends to be the opposite of developed markets, and as such, different approaches to completing tasks, even regular tasks, are used. These approaches may appear inefficient to the observer, but generally demonstrate highly efficient use of available resources. This environment is particularly suited to entrepreneurial activities, and as a designer you can often create products or services that enable others to add additional value for the ultimate consumer.

2. **It’s not what you know, it’s who you know.** Social knowledge is embedded in the way people live – navigation and even communication (in a local dialect) rely upon finding local knowledge upon your arrival in a new area. This approach defies attempts to automate or digitize and highlights the challenge of integrating design in a social context. Social networks can be much more complex and interrelated than those in developed markets. A successful approach can be seen in dating websites that involve third parties (like parents or chaperones) in the process of finding and establishing a romantic partnership.

3. **Order through chaos.** Situations that look chaotic to an outsider often follow some implicit order, which is clear to those within it. Although roads in emerging markets often appear to have no structure (at least, one that follows road markings), there are many different levels of communication and codes of behavior that provide some order. Allowing people to find the signals relevant to them in a sea of noise can sometimes make more sense than trying to remove noise from a design.

4. **Everything is shared.** In many emerging markets, the density of human life is so great that there is a lack of personal space. In addition, people tend to share things more readily – mobile telephones, for example. One design response is to facilitate sharing but also allow people to protect privacy and potentially use virtual personal space to deal with a lack of physical personal space.

5. **Context is king.** One of the great things about designing for emerging markets is the way in which designs are embraced by people and used for totally different purposes than those that the designer originally intended. Context will dictate the way in which a design is used, rather than the objectives of the design itself. This lack of control over use can be threatening to a designer, but designing for openness and
flexibility, by maximizing the degrees of freedom in interactions, can create new opportunities.

6. **Expect the unexpected.** As noted earlier, infrastructure in emerging markets can be unreliable, so it is important to design interactions that can be interrupted and resumed later. In addition, allowing people to share their attention between tasks helps them manage multiple tasks effectively. Even simple design changes, such as allowing people to take longer to complete a task, can make a big difference.

7. **Stay on the beaten path.** When creating alternatives to current behavior, it is not enough to be “as good as” – you need to be considerably better than the alternative. Beyond being old habits, the paths people are currently using are highly efficient for them, and your solution needs to provide a beneficial alternative. Disruptive alternatives that completely supplant current solutions can be particularly effective in these situations.

8. **Everyone is MacGyver.** This theme seems to be a common across every emerging market. People are constantly fixing things when they break, and if they don’t know how, they’ll try, and if that doesn’t work, they’ll find someone who can fix it. These actions contrast sharply with the disposable and expendable view of technology in developed countries. Designers can create “fixable” solutions that are easy to repair – using screws instead of glue, for example, can make mobile phone chargers “field serviceable.”

### Literacy and Numeracy

Information architecture, with its focus on language and structure, is crucial to effective communication. This emphasis is particularly important when designing for people who have limited literacy and numeracy and little experience with highly structured data.

In many emerging markets, levels of literacy are barely above 50%, while in some rural areas can be as low as 10-15%. These levels can lead to huge challenges with embracing technology and socioeconomic opportunity – how can you use a telephone (even a mobile telephone) if you are unable to dial numbers?

Going beyond words, using pictures and iconic metaphors is one way to engage people with limited literacy and numeracy. Voice-based navigation is also emerging as a possible solution and can already be seen in mobile phones as a feedback mechanism (the Nokia 1200, Nokia’s lowest-cost handset, features a speaking clock/alarm).

### Role of IAs

Information architects and user experience professionals, if they have a deep understanding of peoples’ needs, can use design to support development, growth and sustainability. Good design helps people maintain their current livelihoods and enables life improvement.

Ultimately, good design is a right, not a privilege. It is the role of designers to ensure that good design is available to everyone, no matter where they are.
Imagine you’re in a forest, surrounded by majestic towering trees. Underfoot is the soft, leafy, damp forest floor. Taking a seat on a fallen log, you arch the kinks out of your hunched shoulders, shake off the stress of the office and take a deep breath of fragrant, moist air. You ask yourself why work feels like you are part of a never-ending rat race...and you wonder...will it ever stop? How are you going to spearhead that major project or work with a new cross-functional team and deliver great results when the organizational environment hampers you?

Much as I hate to interrupt your well-earned contemplation, I’m compelled to inform you that on the underside of the log you are sitting on is a life form teeming with insight about organizational behavior. Throughout the seemingly quiet forest, thousands of spores are performing an age-old dance, expressing quietly the tactics of surviving and thriving in this dynamic and ever-changing wooded environment. Say “hello” to slime mold. This lower fungus has evolved a clear set of survival techniques that are potent lessons for people grappling with challenges posed by shifting companies and markets. Who knew that insights into survival could be found literally under your feet?

For years, biologists, botanists, media moguls, artists, authors and technologists have been captivated by the sophistication and tenacity of the slime mold lifecycle and the slime mold’s ability to morph from plant-like to animal-like behaviors in constant sync with the environment. I’m not a biologist. I’m a designer working in the field of digital products, information architecture and interaction design. But over the past eight years, I’ve been entranced with slime mold as a compelling metaphor for organizational development. In my work as an employee, manager, director and consultant, I’ve observed how organizations and teams shift in response to external forces, and I’ve found trends and patterns for acclimating and adapting to change. This article shares the examples that I’ve observed and explores possibilities and approaches for how businesses and people in them can better adapt to a rate of change that is rapidly becoming the standard for doing business. By using slime mold as a learning tool, we can identify practical tips and tools for surviving, thriving and doing great work in even the toughest of environments. This fascinating life form holds intriguing lessons for today’s knowledge worker... from sensing and responding to environments that become hostile to using the power of signals to create alignment and collective action.

A Quick Look into the Slime Mold Lifecycle

Let’s get started by learning a bit about a specific type of slime mold: dictyosteliomycota, (dik-tea-oh-stee-lye-uh-my-coat-uh), also known as cellular slime mold. This organism lives in wooded areas and forest floors, feeding off of bacteria and other organic nutrients. When the environment is rich and there is food available, slime molds function as individual amoebas, feeding and dividing in a fairly regular lifecycle. In this phase of its life, cellular slime mold is in constant check with its environment, sensing and signaling the level of nutrients available.

However, as the nutrient base becomes exhausted, slime mold shifts gears. When the change in the food level is detected, the amoebas send out a specific kind of signal and band together to form a multi-cellular assembly (pseudoplasmodium) that resembles a slug. In this phase of its life, slime mold behaves as a unified organism, with a head and a tail and the ability to crawl. The slime mold slug then crawls to another location to find a sustaining food supply.
Lesson #1: Maintain a Constant Conversation between the Organism and the Environment

Slime mold has cracked an important code: It has figured out how to be in constant conversation with its environment. Organizations can become immediately more adaptive by 1) understanding the relationship between the organism and the environment, 2) adopting ongoing signaling and sensing behaviors and 3) triggering change.

Understanding the relationship between the organism and the environment.

Slime mold amoeba spread out as they grow. During this phase of their development they maintain a tightly coupled relationship with the forest floor. As the amoebas feed, the environment changes in response. It is this close relationship that allows the slime mold to respond rapidly to any shift in the food supply.

To understand this relationship it’s important to identify what’s the organism and what’s the environment. In organizations, it’s always a matter of context. From an employee perspective, the individuals are the organisms and the team or workgroup is the environment. For teams and workgroups, the collective is the organism and the department or division is the environment. For departments and divisions, the organization or company is the environment. For organizations and companies, the marketplace or industry is the environment. Using this model can help us understand the dynamics between people, their behavior and the environment.

Adopting ongoing sensing and signaling behaviors. The key to slime mold behavior is its ability to sense and signal the state of the environment to other amoebas. The collective survival of the organism is dependent on this sensing/signaling behavior, made possible by the tightly coupled relationship between the organism and the environment.
In contrast, institutions and companies don’t have this feedback loop. Most organizational structures define relationships and behaviors from the top down and promote behavior that keeps participants carefully shielded from areas outside their direct realm of participation. The most common organization model, that of top-down hierarchical divisions, was created in response to an industrial-age environment and is designed to optimize decision-making. Both divisions of labor and information flow from the top down. Thus, current structures restrict the flow of information, and as a result companies are unable to respond to emerging needs and opportunities in the marketplace. Centralized, hierarchical structures are great for making decisions and rolling out new initiatives, but decision-makers at the top are not able to sense and assess the shifts that happen on the fringes of the organization.

The result? In order to adapt, companies are forced to restructure from the top down. Wholesale reorganizations take significant time and effort and cause severe disturbances in the teams, communications and productivity of workers. Worst yet, by the time the people in the organization have acclimated to the new roles, responsibilities and processes, the landscape may have shifted again. The cost in organizational effectiveness is too high, and we need to look at different models...models that are in tune with environmental changes and institutions that can adapt and evolve in a more fluid, responsive way.

Clear and strong signals increase survival ability and alert other organisms in the environment about what’s happening. In order for signals to be effective, they must be reinforceable and trigger an awareness of a response or call to action. So how do we make great signals? Great signals are sticky, high-volume and visual. Let’s look a little deeper.

In their book Made to Stick [1] Dan and Chip Heath outline a set of criteria that they attribute to making memorable or sticky viral signals. The book is informative, engaging and highly recommended. Dan and Chip identify six characteristics of memorable messages: simple, unexpected, concrete, credible, emotional and stories.

- Simple – keep the heart of the idea easy to grasp
- Unexpected – catch people off guard and grab their attention
- Concrete – include tangible, clear elements to ensure that people connect and remember
- Credible – make an idea believable and trustable
- Emotional – ensure people see the importance of an idea
- Stories – use narrative to inspire and empower people.

High volume signals carry with them intensity and resonance that make them likely to be passed on. High volume signals are often related to specific ways the organization communicates. For example, a one-on-one casual conversation with a co-worker may have low volume. An annual shareholders meeting with the full executive team would have a high volume. Volume is about amplitude...the strength of the signal and where and how it is applied can dramatically affect the impact it has.

Visual signals use images and pictures to communicate meaning in compelling ways. Visual ideas get through faster; they activate the holistic, “all at once” side of the brain. Also, pictures communicate a more complete idea. They show relationships, highlight connections and reveal spaces that are impossible to see with written and spoken forms of communication. Images have also proven to be durable and memorable. They literally show people a picture of the signal, which aids in recall and promotes the ability to share it with others.

Triggering change. What’s the purpose of these clear and re-enforceable signals? Let’s head back to the forest floor. We last left the slime mold happily munching on biomass. But now the amoeba notices a change. The food supply has thinned. The environment has shifted, and it’s time to become very aware of the signals coming in. The slime mold has the ability to send a signal of its own: a chemical called cAMP (cyclic adenosine nucleotide)
monophosphate) that is sent out to the slime mold community. As other amoebas recognize the change in the food supply, they reinforce and amplify the signal. By sensing and signaling, the chemical message begins to spiral through the slime mold community, becoming stronger as the environment continues to triggerwarning signals.

This signaling behavior begins a phase change for the slime mold. This change happens when the environment becomes tough and the organism is at risk. When the overall level of alarm reaches a threshold, it triggers the collective action, and the aggregation begins.

A tough environment is one where the nutrients are disappearing. These environments have these characteristics: limited resources, power imbalances, heightened competition, shifting landscape and unclear paths. For organizational environments add in lack of shared vision, intense politics, disagreement of purpose, ambiguous and fluctuating power structures, disconnect on values, lack of respect and low levels of trust. Organizations in tough environments require hypersensitivities and increased awareness.

Organizations in shifting markets exhibit this behavior, yet often choose denial rather than adaptation. The inability of the auto manufacturers to address their changing market is a prime example. Despite signals that the economic landscape has permanently shifted, the approach taken is one of “let’s get through these bad times, and when things improve we will be okay.” The reality is that when things get better they will also be different, and old behaviors won’t be enough. Instead, these organizations need to adopt new behaviors in order to adapt to the new economic drivers.

Lesson #2: Have a Clear Set of Roles and Behaviors in Times of Change

Sometimes tough environments turn good again. Crisis averted. Sometimes they get worse and turn into hostile environments…calamity ensues. Unlike the complexity of tough environments, hostile environments are very simple: Something is trying to kill you, and you need to change or you will cease to exist.

In hostile environments slime mold does something very special – it changes state completely. No longer a group of motley, starving, cAMPing signalers, the slime mold amoebas aggregate into a slug to make a getaway. This transformation happens wholesale. The slime mold is not a colony or a swarm, but a multi-cellular organism working together with differentiated parts and roles, all focused on escape and survival.

This collaborative and emergent behavior intrigues biologists: how does this transformation occur? How do individual amoebas know what to do? Who is in charge? The answer: It’s a collective action. The roles the amoebas play are partially predetermined, but roles adapt and adjust based on the other participants in the aggregate.

In the human view, there are various roles in organizational transitions, and in order to participate intentionally and effectively, it’s important that individuals consider in advance the parts they wish to play. How will you participate when things get rough? How much do you want or need to take part in the collective action? In order to make an informed, intentional choice, you need to know what you won’t give up and what you can leave behind.
Change is difficult, disruptive and disorienting. It’s common for organizations to make it very difficult to have thoughtful and honest endings to company participation. Looking to slime mold, there are three key roles that emerge during this transition: cheaters, martyrs and survivors. All are valid ways of participating in change, and all can have positive outcomes for both the individual and the organization when planned and managed for mutual benefit. As individuals, the smartest thing we can do is decide ahead of time what role we believe we will play and not be caught unaware.

In the slime mold world, certain amoebas are pre-destined to participate only reluctantly. These cells have a genetic mutation that prompts biologists to call them cheaters. During the slugging, crawling and spore phases of the slime mold lifecycle, these cheater cells just go along for the ride. They are able to disregard the calling to participate as martyr cells, which are those that form the stalk during the spore phase.

However, cheaters are not a given. Chris Thompson of the University of Manchester’s faculty of life sciences explains, “Interestingly, we noted that cheaters only cheated in the presence of non-cheaters – when they could get away with not ‘bailing water.’ When surrounded by other cheaters, they contribute to the group effort again, ‘aware’ that if no one does, all of them will die” [2].

Human systems have cheaters as well. But unlike the pejorative term applied to the slime mold behavior, the role of the cheater can turn out well for both the individual and the organization. Most cheaters maintain course during much of the transition, providing much-needed stability to the social fabric. When they do leave, they take old organization behaviors and expectations with them. People leave a company during tumultuous times for all kinds of reasons: lack of stability, layoffs and downsizing, frustration and political turf wars.

When cheaters leave and start new companies or join other organizations, they act as industry pollinators, bringing their experiences and lessons into new environments. Overall in the scheme of things, cheaters are natural and valid participants in the landscape of shifting markets.

So who’s doing all the work? Martyrs bear the brunt of it. In the slime mold world, a select number of cells are predisposed to form the muscle that enables the organism to move. Martyrs power the slime mold as it moves to a new and fertile environment, then form the structure of the stalk that supports the fruiting body. But these cells die during the last phase of the lifecycle, in essence “taking one for the team.” [3] In human terms, these martyrs are the people that work to ensure that organizational change happens. They support and drive the strategy and the direction during difficult times. But there’s a catch: as change-agents, they bear the brunt of the effort to change and leave the organization before reaping the benefits of their work.

I call this phenomenon the Moses Paradox, which is “the ironic reality that whoever is the key to building a new worldview doesn’t get to experience it.” The paradox is that in many cases, these people believe in and support the organizational change and participate fully in the transition. Yet because of this level of involvement, they are often in a position where they must use all their organizational and political capital to keep the team moving in the right direction of change. When the situation stabilizes, all too often they are either personally burned out due to their efforts, or forced out by the new leadership structure.

Finding yourself in the Moses Paradox can be a powerful and informative experience. That said, it’s crucial that you realize it’s happening, else you are being set up for a very surprising and disappointing close.

How do you know if you are subject to the Moses Paradox? Keep an eye out for these patterns: You work hard to protect the people on the team. You are pressured (and willing) to speak truth to power. You stand up strongly for the values of the culture. You recognize and embrace the need for change. You are willing to have difficult conversations with stakeholders and executives. You are asked to provide leadership and judgment in a severely volatile environment. You use your political capital to negotiate for the time and resources needed to make it through the change. You are held accountable for hard-line outcomes and measurable impacts in an environment that is ambiguous and unknowable.

Like cheaters, when martyrs leave, they carry with them their valuable experiences. Many times, people who have played this role are affected significantly by the experience, and in their new environments they work to create company structures that are more adaptive and resilient to market forces.
Who is left after the others are gone? The survivors – those tasked with the difficult challenge of acclimating to the new environment and defining new norms of behavior. After an organizational disruption and phase change, the relationships between people in teams, departments and other organizational divisions are ruptured and must be remade. It’s important to rally morale after such a change and look to the future for how the new relationships and environment will function. This moment is a golden opportunity to put in place mechanisms that help maintain healthy signaling and sensing behavior and to fully adopt an organizational competency in adapting to change.

Lesson #3: Foster Behaviors That Promote Healthy, Rich Environments

A rich environment is one where an organism can thrive and flourish. These environments can be described as nourishing, resource-rich, plentiful, un-metered, open, expansive and diverse. For slime mold, a rich environment means a high amount of bacterial food supply and plenty of room to expand. For organizational environments, a rich environment is one in which people have a shared vision and purpose, hold strongly shared values, are participatory, inviting, supportive and purpose-driven, and where high levels of trust exist.

In a harsh environment, sensing and signaling behavior was the alert for survival. In rich environments, how teams and individuals sense and signal creates ways for participatory, collaborative environments to thrive. When used in combination with models that support individual exploration, an organization’s ability to rapidly sense changes, signal new opportunities and capitalize on environmental shifts in positive ways is dramatically increased.

Techniques for sensing, signaling and exploring include listening platforms, working out loud and temporary autonomous zones. **Listening platforms: What do you hear?** Technologies for signaling and sensing are on the rise. The democratization of publishing has created an unprecedented ability to share ideas widely and cheaply. Blogs, wikis, texting and other forms of sharing bits of information are shifting the social norms of how communities communicate and how collective activity is fostered and matured. But with so many signals washing over us all the time, how can we keep up? Where do we look for good signals? Personal listening platforms, communicating at the joints of an organization and getting the view from the heights are tools that are useful in ongoing signaling and sensing.

**Personal listening platforms** include any technology that scans the landscape and sniffs out keywords or influential people that you want to keep tabs on. Twitter, the developing social ecology of messages, updates and alerts allows people to keep a light connection in 140 characters or less per message. The core twitter service is more of an idea than a service… and the resulting services landscape has spawned a wide variety of applications that make Twitter and the volumes of messages it spawns more digestible. The older but no-less-important tools for listening are RSS and Google alerts. Keeping up with keywords on Google alerts is a fast and quick way to keep tabs on the pulse of a topic.

**Communicating at the joints** helps capture information across organizational boundaries. Like water-cooler conversation, sometimes the most meaningful signals are ones that happen at the edges of departments and divisions. Talk to people at the joints – the people who work on multiple projects, support multiple groups or have visibility into multiple departments. Find out what the priorities are for the work, what challenges are currently being addressed and what ideas are taking off with decision-makers. The nature of signals is based on human contact…something has to touch, so take some time to talk business with the people who see what kind of communications and touch points happen across organizational divides. Be thoughtful about respecting the source. Approach these dialogues as a way to foster relationships that are mutually beneficial to understanding and aligning to the important trends going on in your organizational community. Be willing to share information in both directions for the security and wellness of the whole.

In addition to connecting with people at the joints, most companies today have a leadership hierarchy where managers, directors and senior executives have broader visibility to wider organizational topics. Knowing the strategies and goals of the people in leadership – getting the view from
This open working style encourages the free sharing of ideas and approaches and serves as a pollinator across engagements. Working together as an ad hoc team enables collaboration for people who don’t frequently work together. Getting early exposure to each other’s working styles makes it easier to hit stride when these people share a project. When the project kicks off, team members start out with an understanding of the different personalities and perspectives. This running start can be crucial on fast-moving projects, and helps a new team get up and run quickly.

**Information radiators** are physical displays of project artifacts. They keep the team up-to-date on the quickly moving set of tasks in progress and keep everyone in sync on the as-it-happens status of the project.

Alistair Cockburn, who defines it as follows, coined the term: “An information radiator displays information in a place where passersby can see it. With information radiators, the passersby don’t need to ask questions; the information simply hits them as they pass.” [4]

Information radiators work because by definition, it takes very little energy and effort to view the display; people can view them just by walking on their usual paths. Another important characteristic is that the information changes over time, rewarding people for paying attention. Placing the work of a team in a visible place is a simple yet surprisingly powerful way to share information, foster interest and invite questions.

**Walk-by contributions** are similar to information radiators in that they are physical, visible and invite viewing. Walk-bys take it an additional step by inviting participation. People contribute as they walk by the display. Sticky notes, a pen and a simple call-to-participate are all you need to get started. Complexity can range from simple information-gathering questions (What job titles have you held?) to more complex idea generation (What is User Experience?). Walk-by contributions open up participation to be inclusive and transparent and to meet people where they are rather than requiring people to contribute only within constraints or norms. Where are good places to put walk-by contributions? Wherever the traffic flow can foster participation: outside of offices, on the outside of office doors, in kitchens, bathrooms and hallways.
Temporary Autonomous Zones: Structured time for unstructured exploration. In 1985 writer and anarchist poet Hakim Bey coined the term T.A.Z: Temporary Autonomous Zone, a temporary space outside the formal structures of control. [5] This idea inspired social and anarchist collectives to foster highly engaged (and often highly outrageous) happenings that broke open the unexpected and created opportunities for new ideas to take form.

Organizations that create spaces for this self-determined, exploratory curiosity are rewarded with new and inventive ideas to consider, develop and pursue. What do these TAZs look like? Here are three examples, ranging from the social to the organizational.

- **Burning Man** is a large-scale social experiment in community, radical self-expression and radical self-reliance that takes place every summer on a dry lake-bed in Nevada. In 2008, almost 50,000 participants collected on the desert for the weeklong event. A characteristic of the event is the large-scale art that is created at and for the event. Many of these visionary and outsider works have been added to public art collections. (That is, if they weren’t burned at the end of the event.) But the ongoing message of the Burning Man experiment is this: Anyone and everyone can create; making things is a crucial part of being human and should be part of everyday life; shared safety and caring for others trumps competitive behavior; and collective action is the lever that changes the world.

- **Wieden + Kennedy Slime Mold Award**: Dan Wieden, co-founder of the famously creative advertising firm of Wieden + Kennedy is a known fan of slime mold. [6] The company created the aptly named Slime Mold Awards to encourage and support employees to realize their creative potential in any medium. Anyone can submit a proposal for the financial award. The only major criterion is that it be off-topic…no ad-related ideas allowed. By explicitly supporting ideas outside the core purpose of the company and fostering creative passion in members of the team, Wieden + Kennedy ensures that topics of exploration and creative fodder are constantly expanding…not slowly dying under the heavy burden of organizational groupthink and norms. This ad hoc and temporary way for people to explore and expand their curiosity with the support of the organization is one way to include the TAZ idea in a more structured environment.

- **Google 20%**: What happens when you bake creative exploration into how a company functions? Let’s look at Google and the 20% factor [7]. At Google the freedom to work on projects of personal interest has become core to the culture and to the business success of the company. In a nutshell, all engineers can (and are encouraged to) spend 20% of their work time (that is, a day a week) on projects of personal interest. It’s estimated that approximately one-half of the new product launches are based on products that emerged from the 20% time. This approach to ongoing, self-determined innovation is being called innovation time off.

The concept of unstructured, creative time isn’t new in innovative cultures that thrive on new ideas. 3M’s culture has long had a 15% version. [8] For example, *skunk works* is a term “widely used in business, engineering and technical fields to describe a group within an organization given a high degree of autonomy and unhindered by bureaucracy, tasked with working on advanced or secret projects” [9].

As this trend grows, it will be interesting to see how other companies adopt and adapt this practice. One thing is certain: many individuals pursuing projects of personal interest can explore and expand ideas much more rapidly than a single executive or management team. In the race for adaptability, the company with an exploratory and inventive staff is better suited to survival.

As these ideas percolate from anarchist poetry and Burning Man into everyday experience and work-life, people in organizations are embracing these new behaviors and shifting the organizational competencies for adaptation.

### Companies Are Made of People

These examples are only a few ideas for how companies can evolve into organizations adept at flexing and adapting to constant change. These new behaviors are going to take some work to get used to and to get good at.

Working collaboratively with others is difficult. Constantly signaling and sensing requires that we cooperate and partner with co-workers, team
members and organizational leaders. It also means that we need to know ourselves, recognize environments that support our goals and needs and have the forthrightness and confidence to communicate clearly and openly about our individual needs, concerns and goals.

We need to realize that this work may never feel easy. To quote community organizer Alison Barrett, “It doesn’t get easier, you just get faster.” And that’s what’s needed...the ability to sense and adapt in tempo with environments that are constantly changing.

That said, we can start with small steps. Learning from slime mold and adopting just a few of its lessons are enough to change our behaviors, to improve our organizations and to create positive change in the world.

After all, if slime mold can figure it out, can’t we?

Resources Cited in the Article


Video Links


Other Resources Mentioned

Twitter: [www.twitter.com](http://www.twitter.com)

Adaptive Path: [www.adaptivepath.com](http://www.adaptivepath.com)

**Information Radiators:**

**Burning Man:** [www.burningman.org](http://www.burningman.org)

**Wieden + Kennedy:** [www.wk.com](http://www.wk.com)

**Google:** [www.google.com](http://www.google.com)

**3M:** [www.3m.com](http://www.3m.com)
The web community has introduced a set of standards and technologies for representing, querying and manipulating a globally distributed data structure known as the Web of Data. The proponents of the Web of Data envision much of the world’s data being interrelated and openly accessible for use by the general public. This vision is analogous in many ways to the web of documents of common knowledge, but instead of making documents and media openly accessible, the focus is on making data openly accessible.

Providing data for public use has stimulated interest in a movement dubbed Open Data [1]. Open Data is analogous in many ways to the open source movement. However, instead of focusing on software, Open Data is focused on the legal and licensing issues around publicly exposed data. Together, various technological and legal tools are laying the groundwork for the future of global-scale data management on the web. As of today, in its early form, the Web of Data hosts a variety of data sets that include encyclopedic facts, drug and protein data, metadata on music, books and scholarly articles, social network representations, geospatial information and many other types of information. The size and diversity of the Web of Data is a demonstration of the flexibility of the underlying standards and the overall feasibility of the project as a whole. The purpose of this article is to provide a review of the technological underpinnings of the Web of Data as well as some of the hurdles that need to be overcome if the Web of Data is to emerge as the de facto medium for data representation, distribution and ultimately, processing.

Technically, on the Web of Data, Uniform Resource Identifiers (URI) are used to identify resources [2]. For example, depending on what is being modeled, a URI can denote a city, a protein, a music album, a scholarly article or a person. In fact, in general any thing can be assigned a URI. An example URI is <http://www.lanl.gov#marko>. This URI denotes the author of this article, Marko. The URI has information pertaining to the what (marko), where (www.lanl.gov) and how (http) of a resource. The URI is more general than the commonly used URL, as URIs are not required to resolve to retrievable digital objects such as documents and media. Instead, URIs can denote abstract concepts such as the person Marko, the class of dogs or the notion of friendship. Finally, the space of all URIs is an inherently distributed and theoretically infinite space. This attribute makes the URI space fit to represent massive amounts of data distributed worldwide. A convenient consequence of this space is that the Web of Data can emerge atop it. However, while URIs can denote things, they cannot denote how things relate to each other. Relating URIs is necessary in order to give greater meaning and context to each datum. Moreover, relating URIs is necessary to create the web aspect of the Web of Data.

The Resource Description Framework (RDF) is a standardized data model for linking URIs in order to create a network/graph of space of all URIs [3]. RDF also supports the linking of URIs to primitive literals such as strings, integers or floating point values. An example RDF statement to denote the fact that “Marko knows Fluffy” is <http://www.lanl.gov#marko, http://xmlns.com/foaf/0.1/knows, http://www.lanl.gov#fluffy>. In order to make long URIs more readable, namespace prefixes are generally used. With namespace prefixes, the previous statement can be represented as lanl:marko, foaf:knows, lanl:fluffy. All RDF statements have this three
component form, where there exists a subject (lanl:marko), a predicate (foaf:knows) and an object (lanl:fluffy). As such, an RDF statement is also known as a triple.

A URI can be involved in multiple statements. For example, it is possible to state that, while being known by Marko, Fluffy is also a dog, 5 years old and lives in Santa Fe, New Mexico. Data on Santa Fe and data on Fluffy become merged when statements involving their two URIs are joined (directly or indirectly through multiple links). The Web of Data becomes powerful when seemingly different data sets are interlinked. The fact that Fluffy lives in Santa Fe automatically connects data about Fluffy to geographic and encyclopedic data about Santa Fe, New Mexico – its geospatial coordinates, nearby cities, culture, population and so forth. As more and more statements are added to the Web of Data, the Web of Data serves, in a sense, as a global database of interlinked heterogeneous data. The combination of both the URI and the RDF has moved the World Wide Web beyond a web of documents to that of a Web of Data, where the minuetae of information can be represented and interlinked for consumption by both man and machine.

RDF’s original use case has evolved beyond that of a logic-language for knowledge representation and reasoning on the Semantic Web [4]. As the foundational technology of the Web of Data, RDF can be seen as a general-purpose data model. It can be used to model formal knowledge (the Semantic Web), for graph/networks (the Giant Global Graph) and for software and abstract virtual machines (the Web of Programs) to name a few additional applications. In many ways URIs and RDF afford a memory structure analogous to the local memory of a physical machine except that this memory structure is distributed over physical machines worldwide. Each physical machine stores and manages a subset representation of the full Web of Data. RDF can be stored on a physical machine in many ways. A simple, straightforward way is to represent RDF statements in a file – an RDF document. A common misconception is that RDF and RDF/XML are one and the same. RDF is a data model that has various serialized representations with RDF/XML being one such serialization. Other popular serializations include N3 and N-Triple. Thus, there are many types of RDF documents. For the small-scale exposure of RDF data, an RDF document suffices.

For the large-scale exposure and processing of RDF data, an RDF repository known as a triple store or graph database is usually the chosen solution. The expanded use of RDF has been greatly facilitated by the continued increase in the capacity and speed of RDF triple stores. Modern high-end RDF triple stores can hold and process on the order of 10 billion triples. Example high-end triple stores include Neo4j [5] and AllegroGraph [6]. What has been the sole territory of relational database technologies may soon be displaced by the use of RDF and the triple store. Moreover, because RDF is the common data model utilized by triple stores, it is possible to integrate data sets across different triple stores – across different RDF data providers. This integration is conveniently afforded by the URI and RDF as web standards and is a function foreign to the relational database domain. With the Web of Data, no longer is information isolated in individual inaccessible data silos, but instead is exposed in an open and interconnected environment – the web environment. The means to integrate RDF data across different RDF data sets is explained next.

**Linked Data and a Distributed Data Structure**

In an effort to provide a seamless integration between the data provided by different RDF data providers, the Linked Data community is focused on developing the specifications and tools for linking RDF data sets into a single, global Web of Data [7]. Two RDF data sets link together when one data set uses a URI maintained by another. For example, suppose the URI lanl:fluffy is minted and maintained by the Los Alamos National Laboratory (LANL). As previously explained, this URI is denoting something in the world – namely Fluffy. However, it is possible for someone other than LANL to express statements about Fluffy. Assume that the Rensselaer Polytechnic Institute (RPI) mints their own URI rpi:fluffy to denote Fluffy, where rpi is the namespace prefix that resolves to <http://www.rpi.edu#>. At this point, both lanl:fluffy and rpi:fluffy denote the same thing – they both denote the same real-world object known as Fluffy. This idea is diagrammed in Figure 1a, where the dashed lines identify which worldly things the URIs stand in reference to. In order to link the LANL data set with the RPI data set, LANL can add the RDF statement <lanl:fluffy, owl:sameAs, rpi:fluffy>
to its data set. This statement states that both lanl:fluffy and rpi:fluffy denote the same real-world thing, Fluffy. This idea is diagrammed in Figure 1b. Given this statement, it is possible to traverse from lanl:fluffy (LANL) to rpi:fluffy (RPI) and thus migrate from the LANL data set to the RPI data set. When two data sets denote the same thing, they can be linked.

The Linked Data community is interested in both unifying RDF data sets as well as specifying the behaviors associated with URI resolution. A Linked Data-compliant data provider should return data when a URI is dereferenced – that is, when a representation of the resource being identified by the URI is requested. More specifically, when a URI is dereferenced, a collection of statements associated with that URI should be returned in some RDF serialization such as RDF/XML. Given the example above, if a machine dereferences lanl:fluffy, it will get the statement <lanl:fluffy, owl:sameAs, rpi:fluffy> returned to it. In other words, LANL returns all the RDF statements for which lanl:fluffy is the subject of the triple (i.e., the outgoing edges from lanl:fluffy). Now, the machine knows that lanl:fluffy and rpi:fluffy denote the same thing. Thus, if it wants to know what RPI has stated about Fluffy, it will dereference rpi:fluffy. Upon doing so, it should get the statement <rpi:fluffy, rdf:type, rpi:Dog> returned to it. To the machine, the Web of Data is one expansive interlinked web of URIs. To the underlying servers, the Web of Data is broken up into multiple RDF subgraphs (multiple data providers) and linked together when one data provider references a URI minted and maintained by another data provider. It is noted that resolving a Linked Data-compliant store’s URI is one way of getting data from the Web of Data. For more complicated data gathering situations, many RDF data providers expose SPARQL end-points to their triple stores. SPARQL is a query language similar to SQL, but focused on graph queries as opposed to table queries [8].

An interesting consequence of the Web of Data is that it can greatly shift the role of application and data providers. Currently, web applications are required to maintain their own data source. For example, Amazon.com maintains its database of books, Springer its database of journal articles and iTunes its database of music metadata. In order for users to utilize this data in interesting ways, these same data providers must provide a front-end application to interact with the data. In this way, data providers and application developers are one in the same entity. This idea is diagrammed in Figure 2a, where each application utilizes its own back-end database to provide its front-end application with data.

With the Web of Data, this model is significantly altered. On the Web of Data, application providers and data providers are cleanly separated. Data providers can provide and interlink book, article and music data on the Web of Data, and application providers can develop software to utilize these data for different end-user services – book recommendations, citation analysis and music metadata population. Moreover, this same data can be utilized by multiple different application developers, which can yield many ways for the end-user to interact with the Web of Data. In other words, Amazon.com’s data might be more efficiently presented and processed if it were open for any developer to create a front-end application for it. This idea is
diagrammed in Figure 2b. The clean separation between data and application providers is already taking place as plenty of interlinked heterogeneous data currently exists on the Web of Data. A few examples are provided here. Book data can be found at Amazon.com’s RDF Book Mashup and the RDF representation of Project Gutenberg. Scholarly data is provided by the Digital Bibliography and Library Project (DBLP), ACM, IEEE, amongst many others. Finally, various music data sets exist, such as MusicBrainz and AudioScrobbler. This data is leveraged, as mentioned previously, by resolving URIs. For example, if one dereferences the URI http://rdf.freebase.com/ns/guid.9202a8c04000641f800000000001a49d in a standard web browser, what is returned is a set of RDF statements (as an RDF/XML document) linking this URI to other URIs and literals. Accessible, interlinked, structured data is the point of the Web of Data. An ecology of applications leveraging this data may greatly advance applications and algorithms for processing data as application developers are no longer burdened by the cold-start problem of requiring large amounts of data to initiate a successful service [9]. Nor will consumers be confined to using certain web applications, as application and data are no longer so tightly coupled.

Linked Process and a Distributed Process Infrastructure

While the Web of Data and the efforts expended by the Linked Data community have provided a path toward global-scale data management, this model is lacking one important component: an infrastructure for data processing. A significant hurdle to overcome for this community is that of distributed processing on this distributed data structure. Traversing the Web of Data is not quite the same as traversing the web of documents. For the human, it is reasonable to traverse from URI to URI exploring the Web of Data in a manner similar to the way the web of documents is traversed. That is, a human, using a web browser, can resolve URIs and view the RDF data returned. Moreover, various human-friendly RDF browsers exist (usually in the form of web browser plugins) to make it easy for humans to view and traverse the data on the Web of Data.

However, a machine (an application, an algorithm) can traverse the Web of Data much faster than a human manually clicking from URI to URI. Moreover, there will be orders of magnitude more resources and links on the Web of Data than those found on the web of documents. While a machine can crawl and pull the data to its local environment for processing, this strategy becomes inefficient when the data requirements span large parts of the Web of Data. Again, note that every time a URI is dereferenced, the resolving server prepares an RDF subgraph and returns it (over the wire) to the requesting machine. Thus, traversing the Web of Data requires data to be migrated to the traversing machine and processed remotely from the data source. This architecture is analogous to the current web of documents whereby traversing it pulls HTML documents and media to the requesting machine. For human consumption this transfer is necessary as data/documents must be rendered where the human is physically located – remote from the data source. For a machine (a virtual machine) its physical location need not be a factor in how data is consumed and processed. Thus, for processing large parts of a distributed data structure, a more efficient mechanism would be to migrate the process between data providers so that

FIGURE 2. a.) The typical web application requires its own data source on which to provide its service. b.) On the Web of Data, application providers are cleanly separated from the data providers.
information is not pulled over the wire, but instead, processed where the data is maintained. In other words, an efficient mechanism for processing the Web of Data would be to move the process to the data, not the data to the process [10].

For the web of documents, the search engine philosophy of “download and index” has made it possible for end users to find information in a more efficient manner than by simply surfing and bookmarking. With modern commercial triple stores scaling to the order of 10 billion triples, centralized indexing repositories will have to contend with not only the volume of data, but also the computational complexities of analyzing such data in sophisticated ways. The Web of Data provides a much richer machine processable data structure than what is provided by HTML and thus, antiquated keyword search simply does not take significant advantage of what the Web of Data is providing. The future of the Web of Data will be rife with algorithms from many schools of thought such as formal logic, graph analysis, object-oriented programming, etc. [4]. Many of these algorithms will compute across various underlying stores of the Web of Data and will require a distributed Turing complete infrastructure to do so. For any algorithm of sufficient complexity, there is simply too much data to pull over the wire and thus, the Web of Data in its current form greatly reduces what is possible.

This state of affairs is unfortunate. Given the potential role of the Web of Data as the de facto medium for interconnecting data, a distributed computing environment is necessary. The Linked Data community needs a parallel Linked Process effort. In a sense, data providers already expose their processors for public use by way of their SPARQL-endpoints. SPARQL serves as an on-site data processing language. However, this language, being a query language, is not sufficient for representing complex algorithms. What is needed is a framework that is more general purpose and that respects the three following basic requirements:

1. **Safe**: applications must not be able to destroy the integrity of the open processor or its data set when using this infrastructure.
2. **Efficient**: applications must run faster in this infrastructure than is possible when pulling the required data over the wire.
3. **Easy to use**: application developers must be able to utilize common programming languages and packages and be relatively blind to the underlying infrastructure.

Developing a distributed process infrastructure that accounts for these three factors will ultimately drive its adoption. With the widespread adoption of such a processing infrastructure by RDF data providers, the Web of Data will reach a new level of functionality. No longer will the Web of Data be only a database serving data over the wire to third-party applications, but instead, a distributed computing environment supporting complex algorithms that can leverage rich data in ways not previously possible in the history of computing. The unification of Linked Data and Linked Process in many ways is similar to cloud computing. However, with the integration of data sets and hardware processors worldwide, this cloud will be much richer and more decentralized than that which exists with other cloud providers. In this form, the Web of Data will afford the world a democratization of both data and process and may perhaps enjoy a frenzied adoption similar to what has occurred with its predecessor, the web of documents.

**Conclusion**

The Web of Data provides an infrastructure that supports an instantiation of a distributed graph of web resources. This distributed graph is created by many data providers who represent and interrelate their data. What emerges from this collective effort is a publicly accessible global database that can be leveraged by both man and machine to any end they deem appropriate. However, the current instantiation of the Web of Data lacks one crucial component: a distributed processing infrastructure. For the web of documents of common knowledge, the solution to the issue of processing the vast amount of information has been to literally download the entire web and index and process it in a single environment. While the content on the web of documents is distributed, the means by which the information on the web of documents is analyzed is not. The Web of Data need not fall into this same model. With the nearly limitless ways in which RDF data can be processed, it would be a disappointment if the data on the Web of Data were left solely to centralized repositories to store, index and provide query
functionality. Beyond disappointment, it would reduce the potential utility
the Web of Data would have given a distributed process infrastructure. By
extending the work of the Linked Data community with Linked Process, the
Web of Data may one day rise to become the de facto medium for representing
and processing data much like the web of documents is the de facto medium
for storing and sharing documents.

Resources Cited in the Article


Selected Abstracts from JASIST

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From JASIST v. 60 (5)


Study and Results: In this study, we propose an approach to build a concept space from the web to provide external concept support for GSS users. We investigate if the concept space contains qualified concepts to stimulate divergent thinking and if providing external concept support can improve group effectiveness and efficiency. The experiment results indicate that the concept space mined from the web contained qualified concepts to stimulate divergent thinking and that external concept support in GSS greatly enhanced group productivity for idea generation tasks.

What’s New? Applying web-mining algorithms to GDSS is our contribution to the GDSS literature. We empirically proved in the experiment setting that providing external concepts mined from the web can increase the effectiveness and efficiency of the idea generation task.

Limitations: Providing external concept to discussion groups may restrict users’ thoughts. This study was conducted in a Chinese environment, and thus the methodology and results may not be directly applicable to GSS in English or other languages.