Ada Lovelace Day page in Facebook

The most recent initiative that took advantage of these strong ties to promote and celebrate as many women in tech as possible is the Ada Lovelace Day: an international day of blogging to raise the profile of women working in technology. 1980 people signed a pledge and agreed to write a blog post or otherwise talk about a woman in technology that they admire on Tuesday 24 March 2009. Suw Charman-Anderson, organizer of the day managed to create a giant buzz using the currently most popular social media tools available: Facebook and Twitter.

There are currently some 1197 posts listed in the mash-up, although that list is not complete as many people did not add their post. Even Tim O'Reilly spread the word by writing a piece titled "It's always Ada Lovelace Day at O'Reilly" on his blog.

More Ada Lovelace Day posts can currently be found here, here and here.

Chat with Suw Charman-Anderson, the Creator of Ada Lovelace Day

Why did you create the Lovelace Day?

I thought that such an initiative was needed because I realized that many people, including myself, had problems naming female role models.
I saw some research that showed women in female role models more than men need male role models, and felt that it was a relatively easy thing to do, to create new role models. All we need to is talk about the women we admire and learn about the women excelling in technology.

What has been the reaction so far?

Incredibly positive. The day itself was a great success with lots of buzz on Twitter, and blog URLs flooding in through Facebook, Twitter and the pledge comments. It was covered by many major news sites here, including The Guardian, The Telegraph and even the freesheet, Metro.
Computer Weekly also did a section on it, and the British Science Museum supported the day too. Finally, I did interviews on BBC Radio Five and the BBC News Channel (tv news).

What benefit do you expect from such a buzz around women in tech?

At the very least, we have raised the profile of many heroines of computing and technology, not just Ada herself, and not just historical figures. I hope that, with all this mainstream media coverage, that we have made a dent in the misconception that anyone interested in technology must be a teenaged boy with bad skin.
Hopefully more women realise that not only is it possible for them to progress in their careers, but also that there are many other women, just like them, who are working in this very male-dominated industry and being successful at it.

Do you think Corporate Companies could have an impact on the current situation? How?

They could have a huge impact, particularly around the issue of maternity leave, career breaks and remote working. Technology changes rapidly, and women who have taken even just a few months off to have a family can easily lose confidence because they feel that they are no longer up to date. The problem is even worse for women who've taken a few years out, and who feel totally at sea because the landscape has shifted beneath their feet. Businesses could help to re-skill women and ease them back into the workplace, and whilst I'm sure some do, I'm also sure that not enough companies think about how they can support women with training through the maternity period.

Mentoring, be it one-on-one or in the networked mode of Silicon Valley, is still one of the most powerful ways to compel young girls and women to consider careers in technology. Female role models are needed in the tech industry, it makes it easier for girls to identify themselves to women, understand their success and day to day life. What has changed are the tools and means for inspiring girls. *"Doing postings on Facebook, Twitter about it or video on YouTube that is accessible to everybody. That s the best thing you can do with social media to create role models and have access to information"* concludes Shaherose in her interview with OLSF.

Lesson #3: Thick Skin needed

As Shaherose Charania points out in her interview with OLSF, they are not many successful innovative and successful women in the Tech media: "Growing up my role models were Steve Jobs and Bill Gates, there were not any women I could identify myself with." When Gina Bianchini did the cover page of *FastCompany* after the launch of Ning.com, wearing simple jeans and a white tank top, she received very critical responses from the mostly male tech audience. "She got destroyed on the blogosphere," remembers Sarah Lacy "it is almost like it made men nervous to see a beautiful woman make it. You need to have a very thick skin to handle being criticized everyday," Lacy notes.

Gina Bianchini on the cover of Fast Company

Chapter 4: What About The Media?

In this section of the report, we turn our observations on the observers, and ask the following questions about the media that covers Silicon Valley and tech culture more generally:

- Is there a bias within Science and Tech reporting among the trade and general press to quote and report on men?
- Are there certain major themes in the trade and business press that highlight the achievements of men, or understate or stereotype women? Conversely, when women in tech are featured, are there stereotypical themes?
- How are male enclaves within the Silicon valley culture perpetuating stereotypes of innovation through interlocking relationships, that in turn generate role models valorized by media which continue to ignore the contributions by women?

These are just a few of the questions that should be, and rarely are, asked about media representations of women who work in tech. Within our ongoing coverage of the literature and our initial quantitative content analysis probes, there are clear preliminary findings for all of the above.

Bias in Media Science Reporting

The literature on media bias is of course voluminous, the specific topic of media bias in reporting on women in technology is less so. Recent studies from the UK[12] have: focused on how newspapers represent male and female scientists, as well as how press officers associated with science organizations mediate representatives of their organizations to the press along gender lines[13]. With respect to the working press on both sides of the fence (reporters and press relations, PR), we can anticipate the same phenomenon American researchers (Kolb and McGinn) observed, namely that "gender practices seem unbiased in isolation, but they reflect masculine values and the life situations of men who have dominated in the public domain of work."[14] As we will see in other quarters of the hi-tech milieu, such as Venture Capital, this dynamic holds true as well[15].

For example, Kitzenger *et al* performed a content analysis of 1,503 articles about science topics – 84% of experts cited in these articles were men. For the area of particular interest for the Orange Labs researchers, which was computers, the number are much worse – **93% of the quotes were from men**, the worst out of five science-related categories.

Tech Themes and Stereotyping

In our own research into media bias within tech and business press, we focused on trade publications for the ICT industry, focusing on US publications[16]. Several types of stories were considered:

[12] Kitzenger, et al; Cardiff School of Journalism
[13] Boyce and Kitzenger, Cardiff School of Journalism.
[14] Kolb and McGinn, Harvard Business School, 2008.
[15] Indeed, we find multiple examples of the phenomenon of (mostly men) responding to suggestions of bias by accusing the suggestor of 'sexism', see for example reactions to a post by Wall Street Journal reporter Kara Swisher about Facebook's all-male board http://kara.allthingsd.com/20070816/the-men-and-no-women-facebook-of-facebook-management/. (scroll down to comments fields)
[16] *Specifically: ComputerWeek, InformationWeek, CIO magazine*

- ***'Top'* Lists** This is a favorite genre among business press, for this context we were interested in issues focusing on "Top CIO's" and such related topics such as top VCs.
- ***CIO Coverage*** As we will discuss below, there is a strong symbiotic relationship betweemn the business press, tech vendors, and cultivating the image and position of the CIO (Chief Information Officer) – by elevating the status of tech procurement within the enterprise press generates increased advertising revenue by delivering this audience to vendors. How the CIO position is reported on is relevant when considering bias effects.
- ***Covers*** An obvious place to look for bias in reportage is on the cover of the magazine itself.

With respect to the Top Lists question, we looked at to different lists, both from *CIO* magazine[17] which caters specifically to this executive audience and vendors trying to sell to them, as well as a larger list of 500 CIOs from *Informationweek*[18] . In both cases, the magazines' results were identical – 15% of both lists were women's names, **85% of both 'Top' lists were men.**

We would argue this is a 'best-case' result – that any editorial staff (and sales execs looking over their shoulder) would be conscious of the fact that diversity is always desirable in such an exercise, and so we treat as reasonable the conjecture that an attempt was made to be inclusive.

That is not the case with the monthly or weekly deadline and everyday stream of events however. So we looked at two indices to see how stereotyping occurs outside of the curated list context. The first was cover art, we looked at a sampling of magazine covers that specifically featured a partial or full-length portrait of a human on the issue cover (photograph or line art was accepted). Out of a total sample of 24 issues featuring humans, **88% of covers featured male** CIOs or other tech leaders.

The second indice we used was a high-level content analysis focused on topic/gender stereotyping. In general, when men were featured on the covers of issues, the stories they were illustrating tended to be about management of technology or people, or more advanced technology evolution. In the instances when a woman was featured (1 out of 3 times in the case of *InformationWeek)* the topic being illustrated was a stereotype reinforcement, such as a story about diversity, or managing vendors. Indeed, when we turn to venture capital – an essential cog in the Silicon Valley innovation machine – the gender stereotyping of reportage is very visible as well. If one Googles the search string "women in venture capital" the US portal will return around 3,000 citations. A similar stereotyped string for 'men in venture capital' returns under 10[19].

The most egregious example was a "Tomorrow's CIO" issue which featured a roundup of opinion by CIO's about the future challenges for their peers: a total of 14 CIO's were quoted in the article, **out of 14 quotes, 1 was from a woman (7%).**

Are there female CIO's? Of course there are. Are they as numerous as men? Of course not. As the related research cited in the opening chapter on women representation in the executive suite showed, the 'cult of the CIO' at best can open up it's ranks to women for about 15% of its membership. The press lags behind the reality, relegating its scanty coverage of female executives to 'women's issues' or just simply ignoring them when it comes time to ask about "challenges".

The Cult of the Venture Capitalist: Doerr's Syndrome

In the current downturn, the luster of venture capital even here in Silicon Valley has faded – the once-predictable exit of enriching investors via an IPO[20] has disappeared along with the emperor's clothes – as of this writing there has not been a single IPO in the past two quarters. That said, the monoculture

[17] *Top CIOs,* May 17, 2007
[18] *Top 500 CIOs, InformationWeek,* September 15, 2008
[19] As of June, 2009.
[20] Initial Public offering

of Venture Capital both nationally and in the Valley is breathtaking. According to a 2008 study from the National Venture Capital Association, an examination of the general partners of its member firms reveals the fact that **88% of the general partners are white, 86% are male**.

Not surprisingly, given this monoculture, the downstream effects are predictable – even though at times they have been wildly successful. As one of the most famous VC's in Silicon Valley, John Doerr, remarked about his business model, "we look for nerds that have dropped out of Harvard or Stanford."

As a result, what we can call Doerr's Syndrome has led to a monoculture within startup ecosystems: according to VentureOne, the VC community of white males has entrusted only **3% of VC money with women-led companies**. According to the same 2006 analysis, only 4% of VC-backed companies have women as CEOs.

In what we could call the White Male Coefficient, this same number of 4% applies to the percentage of women represented on *Forbes* magazine's "Midas List" of 100 most successful VCs for 2007.

A balanced view of this situation must take into account the 'pipeline' problem – women at the helm of startups seeking funding are hard to find, therefore seeing them get funded is going to be difficult as well. As Sara Lacy notes in our video: " Because that's what a lot of VCs say if you ask them why they don't fund more women entrepreneurs, they say 'we don't see them…less of them come in an pitch us.'" Indeed, a notable exception that proves the rule is Tim Draper, the legendary VC and co-founder of Draper, Fisher, Jurvetson, who is famous for performing a strip tease based on the number of women-entrepreneur-led companies his firm has funded[21].

[21] The number is six.

Chapter 5: Three Generations of Women and the Net

Despite the persistent under-representation of women in STEM fields (Science, Technology,Engineering, & Mathematics), one can find three generations of women converging in the workplace today: Baby Boomers, Gen X, and Gen Y. Baby Boomers represent Americans who were born between 1946 – 1964. Marked by the birth boom after World War II, most of the boomers grew up during the counterculture of the 1960s. Close to 80 million strong, Baby Boomers constitute the largest segment of the American population. Gen X, relative to the Baby Boomers, is a much smaller but highly educated group. Gen X were born to Baby Boomers during 1965- 1976. They also represent a very diverse group in which Hispanics, African American, Asians and other minorities constitute 38% of this particular demographic.[35] Gen Y were born between 1977 – 1995 and include a particular cohort often referred to as Millenials who were born between 1980 – 1995. Gen Z are the youngest generation and include those born after 1995 and include many of the teenagers today.

Generations Explained

Generation Name*	Birth Years, Ages in 2009	% of total adult population	% of internet-using population
Gen Y (Millennials)	Born 1977-1990, Ages 18-32	26%	30%
Gen X	Born 1965-1976, Ages 33-44	20%	23%
Younger Boomers	Born 1955-1964, Ages 45-54	20%	22%
Older Boomers	Born 1946-1954, Ages 55-63	13%	13%
Silent Generation	Born 1937-1945, Ages 64-72	9%	7%
G.I. Generation	Born -1936, Age 73+	9%	4%

Source: Pew Internet & American Life Project December 2008 survey. N=2,253 total adults, and margin of error is ±2%. N=1,650 total internet users, and margin of error is ±3%.

*All generation labels used in this report, with the exception of "Younger -" and "Older -" Boomers, are the names conventionalized by Howe and Strauss's book, *Generations*: Strauss, William & Howe, Neil. *Generations: The History of America's Future, 1584 to 2069* (Perennial, 1992). As for "Younger Boomers" and "Older Boomers", enough research has been done to suggest that the two decades of Baby Boomers are different enough to merit being divided into distinct generational groups.

In understanding the contribution of the three generations of women in Silicon Valley, we suggest contextualizing these contributions with respect to the Internet as a useful and productive lens. First, we look at the broad spectrum of use by each generation. Here find that basically, the Boomers that invented the basic technical bricks behind today's Internet focus on core utilities such as email. The GenX women of Silicon Valley who co-created the World Wide Web and connected it to the world we all live, work, shop and recreate in, use Internet e-commerce and entertainment applications. The GenY women of Silicon Valley can be seen everywhere on the new forms of social media, which they use to amplify their voice and collectively build a new layer of public and transparent emotion on the top of preceding generations' contribution.

According to the Pew Internet & American Life Project, email represents the most popular online activity, particularly amongst older internet users. On the other end of the spectrum, social networks, blogging, instant messaging, and now microblogging, in the form of services like Twitter, are gaining popularity as the default form of communication for many young people. While younger people dominate the web, with Gen Y and Gen X constituting more than half of the internet population, Baby Boomers are increasingly online and making their presence felt. However, there still exist notable areas of internet use that distinguish each generation.[36]

Baby Boomers look at the internet from a utilitarian point of view and not so much as an instrument for socializing or a medium for entertainment. They approach it more as a tool for emailing, making

purchases or information searches. Not surprisingly, they use the internet to search for health information with greater frequency than younger generations like Gen Y& Z.

Pew notes that online shopping is the main focus of Gen X, with 80% of them buying products via the internet. Younger people (teens), Younger Boomers, and Older Boomers practice much less online shopping, 38%, 56%, and 47% respectively. Gen X also leads in online banking (67%), with Gen Y not too far behind at 57%.

In contrast to Baby Boomers, Gen Y and Gen Z flock to the internet for its social and entertainment value. With a plethora of entertainment options, teenagers and young adults find myriad ways to amuse themselves via online games, virtual worlds, and online videos and music. Internet users between 12-32 years-old read blogs, write their own blogs, and use social networking sites far more than older generations as the chart below indicates.[37]

While striking differences can still be found amongst the generations of internet users, one pattern is clearly emerging. More and more people are participating in social media. In a recent report, Forrester Research revealed a significant increase in the use of Social Technologies with 75% of internet adult users actively using them, compared to 56% a year earlier.[38] For the most part, this incredible growth has been fueled by the participation of women of all ages.

Amongst Social Media services, Facebook in particular has been growing exponentially. In August 2008, Facebook crossed the 100 million users mark. By January 2009, it reached 150 million. And more recently, expanding at the rate of "nearly half a million users per day, every day, since late August" Facebook announced it passed the 200 million user mark in April 2009.[39]

As of February 2009, women are the majority in every age group category on Facebook. And the segment of Women over 55 are growing at the fastest rate, up 175% during the period Sept08-Feb09.[40] Overall, the Facebook audience is comprised of 56% women.[41] The trend of women dominating social network applications has been well-documented. Perhaps the most high-profile service in the Social Media space at the moment is Twitter, a short-messaging system that allows users to broadcast messages less than 140 characters, "tweets," via their mobile phone or computer. Most Twitter users are female and young adults.

Generational Differences in Online Activities

	Online Teens[a] (12-17)	Gen Y (18-32)	Gen X (33-44)	Younger Boomers (45-54)	Older Boomers (55-63)	Silent Generation (64-72)	G.I. Generation (73+)	All Online Adults[b]
Go online	93%	87%	82%	79%	70%	56%	31%	74%
Teens and Gen Y are more likely to engage in the following activities compared with older users:								
Play games online	78	50	38	26	28	25	18	35
Watch videos online	57	72	57	49	30	24	14	52
Get info about a job	30`	64	55	43	36	11	10	47
Send instant messages	68	59	38	28	23	25	18	38
Use social networking sites	65	67	36	20	9	11	4	35
Download music	59	58	46	22	21	16	5	37
Create an SNS profile	55	60	29	16	9	5	4	29
Read blogs	49	43	34	27	25	23	15	32
Create a blog	28	20	10	6	7	6	6	11
Visit a virtual world	10	2	3	1	1	1	0	2
Activities where Gen X users or older generations dominate:								
Get health info	28	68	82	74	81	70	67	75
Buy something online	38	71	80	68	72	56	47	71
Bank online	*	57	65	53	49	45	24	55
Visit gov't sites	*	55	64	62	63	60	31	59
Get religious info	26`	31	38	42	30	30	26	35
And for some activities, the youngest and oldest cohorts may differ, but there is less variation overall:								
Use email	73	94	93	90	90	91	79	91
Use search engines	*	90	93	90	89	85	70	89
Research products	*	84	84	82	79	73	60	81
Get news	63	74	76	70	69	56	37	70
Make travel reservations	*	65	70	69	66	69	65	68
Research for job	*	51	59	57	48	33	9	51
Rate a person or product	*	37	35	29	30	25	16	32
Download videos	31`	38	31	21	16	13	13	27
Participate in an online auction	*	26	31	27	26	16	6	26
Download podcasts	19	25	21	19	12	10	10	19

* Source for Online Teens data: Pew Internet & American Life Project Surveys conducted Oct.-Nov. 2006 and Nov. 2007-Feb. 2008. Margin of error for online teens is ± 4% for Oct.-Nov. 2006 and ±3% for Nov. 2007-Feb. 2008.

[b] Source for Online Adult data: Pew Internet & American Life Project Surveys conducted August 2006, Feb.-March 2007, Aug.-Sept. 2007, Oct.-Dec. 2007, May 2008, August 2008, November 2008, and December 2008. Margin of error for all online adults is ±3% for these surveys. The average margin of error for each age group can be considerably higher than ± 3%, particularly for the "Matures" and "After Work" age groups. See Methodology for average margins of error for each generational group.

` Most recent teen data for these activities comes from the Pew Internet & American Life Project Teens and Parents Survey conducted Oct.-Nov. 2004. Margin of error is ± 4%.

' No teen data for these activities.

http://www.pewinternet.org/Infographics/Generational-differences-in-online-activities.aspx

Indeed, in a recent analysis conducted by Rapleaf of all major social networks in use today, the female-to-male ratio among users younger than 25 was at least 1.5:1 and for major networks Facebook and Bebo above 2:1.

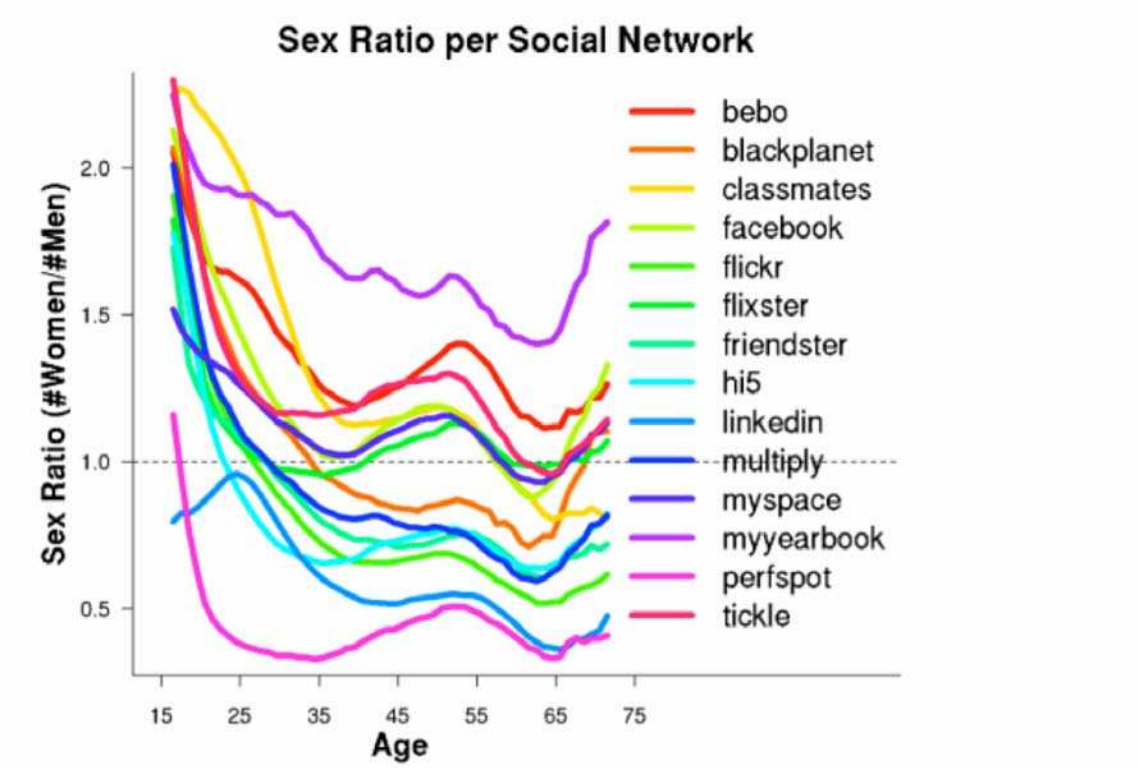


Figure #2:Sex ratio is significantly biases toward young women (14-24) on most social networks. If a point is above the dashed line at 1.0 it means that there are more women than men, and vice versa.

http://www.mininglabs.com/2008/08/05/digging-through-rapleaf%E2%80%99s-study-on-gender-and-age-in-social-networks/

The implications of a 'pink' future for a socially-inflected Web are at the heart of the study's findings. We proceed from here by contextualizing the evolution of the Internet via the lens of women's contributions.

3G(enerations) of Women and the Internet

The convergence of three generations of women in the workplace in the technology field today must be contextualized within the evolution of the Worldwide Web itself. While we have earlier in this chapter discussed demographic differences in the use of the internet by generation, we can also examine how changes in the technological environment affected particular generations of women who work in the technology sector. Likewise, we can see how the contributions of of each generation of women in the Valley shaped the evolution of the Web.

A clear parallel exists in the trajectory of the web and the women who work in the technology field. In it's early stages, the internet was about information and the retrieval of data. This, era of the

Informational Web, witnessed the emergence of companies like Yahoo that focused on search in its early form. The paradigmatic representation of women in Silicon Valley who contributed to this phase is that of the **Maker**.

The second stage of the internet, the Relational Web, was characterized by its focus on people. Early versions of social networks like Friendster, Match.com, & MySpace are representative of the drive to connect with others. The corresponding paradigm for women executives and founders in this stage of the Web (which encompasses the Dot.com bubble) is that of the **Connector**.

Today, in its third stage, the Emotional Web is marked by a highly expressive state, where emotions, statuses, opinions, and experiences are amplified via their distribution and augmentation by social media tools. The paradigm for women and girls in tech here is that of the **Amplifier.**

Generation of Makers

Boomers like Sandra Lerner, Judy Estrin and Padmasree Warrior could be characterized as "Makers." Here we find women who used their engineering degrees to invent the basic building blocks that would lead to today's Web.

Sandra Lerner was the co-founder, along with her then-boyfriend Len Bosack of the world's most well-known tech company, Cisco. After graduating from Stanford University with a Computer Science degree in 1981, Lerner went to work for the university as Director of Computer Services for the Business School. There, she and Bosack, along with students and future Sun founder Andy Bechtolstein, and William Yeager, the man who wrote the code for what is now the Cisco NOS (Network Operating System) built a 'blue box' that became the first network router. Lerner and Bosack founded a company and named it Cisco in 1984, and 1985 found them hand-assembling routers in their living room in Atherton. A key decision made by the couple was to focus on the then-emergent TCP/IP protocol, removing other protocols from the original Stanford blue blox. That decision would allow them to retire just three years later. The rest of the company's history would be about mass-production of the IP appliance that would become the infrastructure for today's Internet.

The networking appliance and the new concept of the router became the basis for a hotly-contest market of networking startups, each addressing part of the ever-widening networking puzzle. Another networking startup, Bridge Communications, was founded by a computer hardware engineer, Judy Estrin, who came to the technology after a stint working at Zilog, one of the first computer chip manufacturers. Bridge was one of a number of firms consolidated in a wave of acqusitions, in this case by 3Com Corporation, the brainchild of Robert Metcalfe, widely credited as one of the inventors of the Ethernet protocol, now the lifeblood of IP-based networks. Estrin would go on to serve as CEO of 3Com, making her one of many examples of women engineers moving into CEO positions[22]

Today, Silicon Valley-trained women of the Boomer era manage some of the world's largest and complex technical organizations. Ann Livermore at HP Solutions, runs a $41 billion services organization for the company that epitomizes Silicon Valley. Janet Perna, who started at IBM's San Jose R&D Lab in 1981, now runs IBM Software's Database business, with 400,000 customers and 60 million users. Interestingly, both women have spent their entire professional career with their current employers.

Generation of Connectors

With women playing a fundamental role in the creationof the basic network for the Internet, it is fitting that the next generation (GenX) of women would be major players in connecting people with things,

[22] Today, the most visible example may be Carol Bartz at Yahoo, who started as an engineer.

products, and each other over that network. The basis for the Connector generation of women in tech was in the introduction of the HTTP/HTML protocol developed by Tim Berners-Lee and Robert Cailliau at CERN, which created the hypertext model of linking pages. The creation of the Mosaic browser made information rendered in this way visible.

The result was a burst of creative and economic activity, most of it venture-funded, that would lead to the Dot Com Bubble. The mantra of this boom-and-bust phenomenon was "network effects" – essentially the idea that traditional industries such as book-selling and travel would be dot-commed by online stores that would attract millions of buyers shopping from their armchair. In the 'free' model that accompanied this paradigm, advertisers would move to the Web to present messages to the millions of "eyeballs" there. This led to the other mantra of "scale fast" and "first-mover advantage". Excesses of the era followed from this "get-big fast" mentality, including interestingly, Boo.com, an online fashion venture that famously burned through $188 million in just 6 months.

But out of this excess came some enduring lessons and models. One was the idea that a compelling online user experience could create economic value. This focus on user experience would empower women who understood how to connect with users over the Web. Another enduring truth was that audiences (the 'eyeballs' of the Bubble) were also a source of online economic value creation. Furthermore, the collective activity of these audiences could be tapped to determine things like relevance – an insight put to enormous effect by Google founders Sergey Brin and Larry Page[23].

GenXers like Marissa Mayer, armed with a Computer Science degree from Stanford, and Gina Bianchini, with an MBA from Stanford University, were among the Connectors who leveraged these lessons. Mayer was the first female engineer and one of the first 20 employees at Google; Bianchini is the CEO of Ning, a platform for social networks.

Along with other GenX Connectors, such as Caterina Fake, the co-founder of Flickr, these creative engineers understood that communities and audiences acted like networks – the lessons of the network effect were there for the taking, even if the wild swings of an overheated stock market weren't.

GenXers as Connectors keenly understand the utility of social media and social networks to the consumers they deliver products to. Indeed, Mayer, as Vice-President of Search Products and User Experience, oversees the design and user interface for Orkut, Google's social network site and Bianchini, as CEO of Ning, enables hundreds of thousands of individuals to create their own social networks.

Today: An Amplified Generation

For GenYers, like Leah Culver who has a degree in computer science, their early careers are being shaped indelibly by the Emotional Web. Women GenY who work in the technology sector make things, like the Makers of the Boomer generation, and are steeped in social technologies, like the Connectors of GenX. Yet this particular GenY's trajectory starts with the amplified effects of the augmenting quality of the Emotional Web.

The concept of sharing content over the Web is a function of social media, with the appearance of MySpace and its instant appeal to girls being a major wake-up call that out of the wreckage of the Bubble, the next major evolution of the Web was underway. The gift of creatives like Caterina Fake was the understanding of content as a "social object" that could be exhibited, put on display, and shared as a gesture of friendship and affinity.

This paradigm brings design into center stage, and related tech media that depend on design, such as videogames benefit from this new focus on user experience. In the videogame marketplace, for example, women designers such as Jane McGonigal and Amy Jo Kim are in high demand for their insight into

[23] But, we hasten to add, largely managed by a woman, Sheryl Sandberg, now the COO of Facebook.

how to deliver engagement – the lifeblood of videogame companies. In a market thought (incorrectly) to be catering to acned teenage boys, key positions are held by women such as Lucy Bradshaw at Electronic Arts,

Today, creative engineers such as Culver at Pownce, or Mena Trott, the co-founder of the massively popular blogging platform SixApart, are pushing the envelope of what social networks can do to amplify each member's status, contributions, and emotions. In this they are helped by a fast-growing wave of users on the Emotional Web, the strong majority of which are female.

Tomorrow: From Content to Code

The surge in women participating in content creation in the social media space is interesting not just for its cultural implications but also for what it means from a professional perspective, especially when considering young girls and women. The importance of social media to future technology careers for young women might very well provide more utility than traditional educational channels. Statistics from the Pew Internet & American Life project also support the idea that young girls use of social media just maybe the salvation from the maddening dearth of women in STEM (science, technology, engineering, and math) fields. Engagement in social media itself might very well be generative not just of crucial mentoring and support but also of the critical coding and programming skills young girls need to have in technical careers.

Statistics show that communication in all its aspects are the domain of girls, from in-person communication to cell phone use to instant messaging. Girls also outpace boys in journal writing 49% to 20%.[42] Driven by a desire to communicate, girls think of social media as simply new tools for broadcasting and publishing.

Gender and Daily Communication Choices

% of teens who participate daily in each activity

	Girls (n=352)	*Boys (n=348)*
Spend time in person outside of school	40%	38%
Send text messages	44*	28
Talk on a cell phone	45*	26
Talk on a landline or home phone	47*	24
Send instant messages	34*	25
Send messages through a social networking site	31*	16
Send email	20*	12

*Source: Pew Internet & American Life Project Teen/Parent Survey on Writing, September-November 2007. Margin of error is ±5%. * indicates a statistically significant difference between the percentages in the row.*

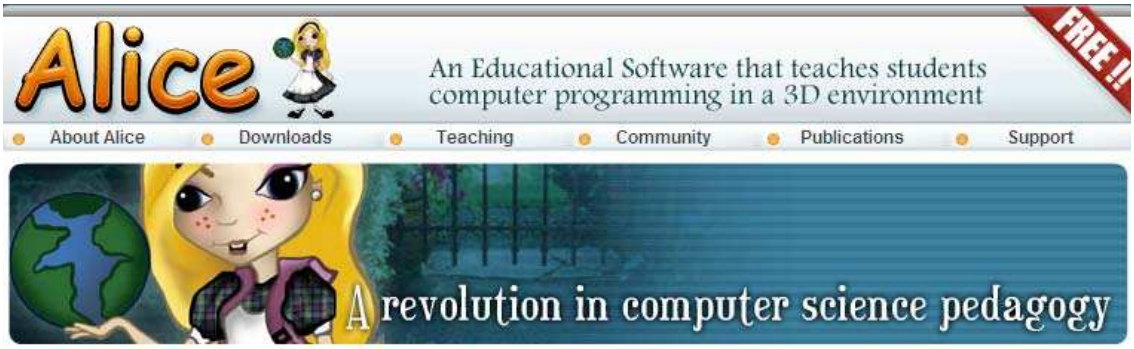
http://www.pewinternet.org/Reports/2008/Writing-Technology-and-Teens.aspx

In the Social Media space, "girls dominate the teen blogosphere and social networks—66% of girls have an SNS profile compared with 50% of boys, and 34% of girls (versus 20% of boys) keep an online journal or blog."[43] And the domination of girls in social media is represented across all ages in the youth segments.

The Pew study found that:

Older teen girls are still far more likely to blog when compared with older boys (38% vs. 18%), but younger girl bloggers have grown at such a fast clip that they are now outpacing even the older boys (32% of girls ages 12-14 blog vs. 18% of boys ages 15-17).

Highly skilled in the art of weaving stories and fostering social connections, teenage girls have embraced the internet and transferred these skills to social media at a time when the technology itself is going through radical changes, allowing content to be treated programmatically, shared as objects, and providing endless opportunity for self-expression . In this peer-based learning model, the exciting convergence of the social web with open source development has enabled an entire generation – GenY – of girls helping girls to make the leap from content-creation to coding.



A notable example of this is The Alice Project (Alice.org), founded by the late Carnegie Mellon Computer Science Professor, Randy Pausch. Alice is an open-source, educational, object-oriented programming environment that teaches young kids how to create animations and tell stories. Alice.org is collaborating with Silicon Valley companies like Sun Microsystems and Electronic Arts to deliver highly tailored educational software about programming to different age groups. For example, Storytelling Alice, was created to specifically focus on middle school children, and girls in particular, to motivate them to learn computer programming by creating short 3D animation movies. Focused on the crafting of stories, Storytelling Alice includes:

1.High-level animations that enable users to program social interactions between characters.
2.A story-based tutorial that introduces users to programming through building a story.
3.A gallery of 3D characters and scenery with custom animations designed to spark story ideas.[44]

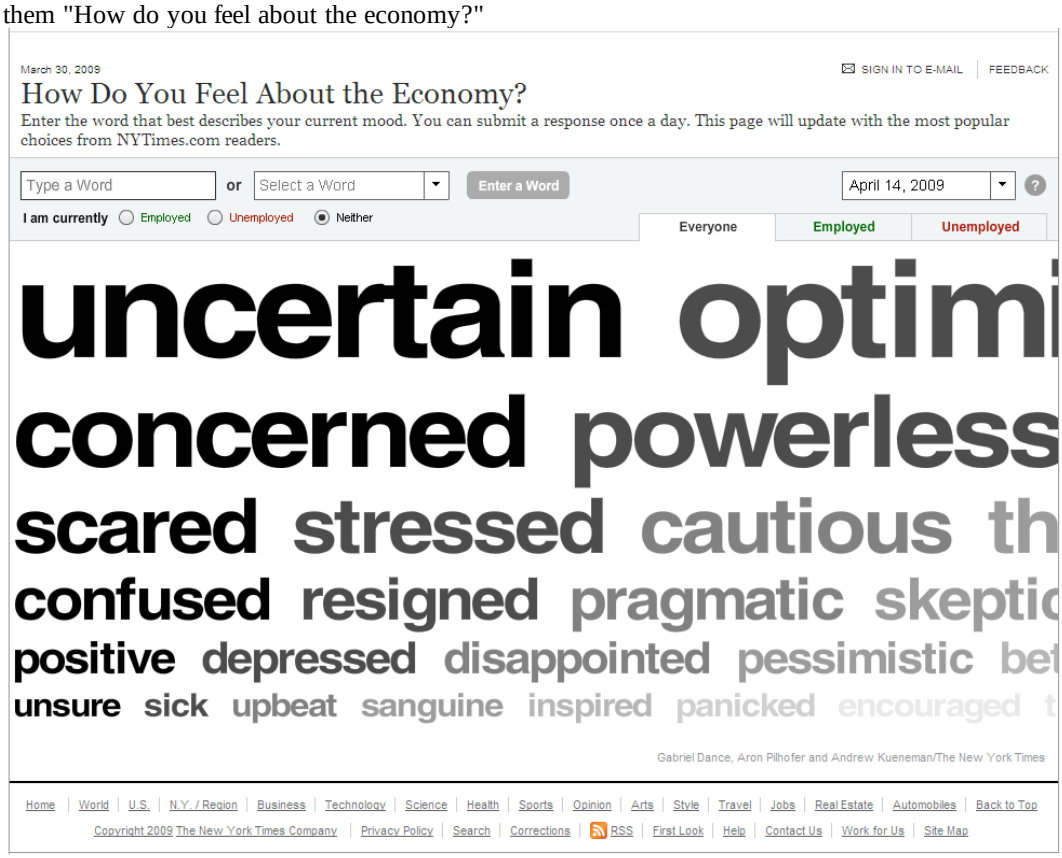
Alice 2.0 shares the same goals and characteristics as Storytelling Alice but its 3D programming environment is age-appropriate for high school and college age youth. It also has a similar focus on girls.

As girls increasingly utilize software like Alice and new open-source social media tools to express themselves, connect with friends, seek support, and discover content, will coding and programming become second nature to them? Judging by the narratives collected by Orange in Silicon Valley from leading women technologists, it seems truly inevitable that today's wave of networked girls will shift tomorrow's technology paradigms with their storytelling.

The Emotional Web

While the open and social characteristics of the evolving internet are creating pathways for girls and young women to gain more skills in programming, generate visibility as content creators, and obtain access to peers, role models, and mentors, it's the internet's evolution, focused on "the moment" and capturing fleeting feelings, that might very well solidify the impact of women in emergent technologies as they become more expressive of current states of emotion.

Look at any number of social media tools today and you will see that almost all of them solicit some sort of expressive input from the user. From Twitter asking "What are you doing?" to Facebook's "What's on your mind?." Similarly, video recommendation engines attempt to tap into people's moods to deliver video content suggestions. For example, Clerkdogs' call to action is "Start with a movie you love." Likewise, the New York Times created an interactive feature for its readers asking them "How do you feel about the economy?"

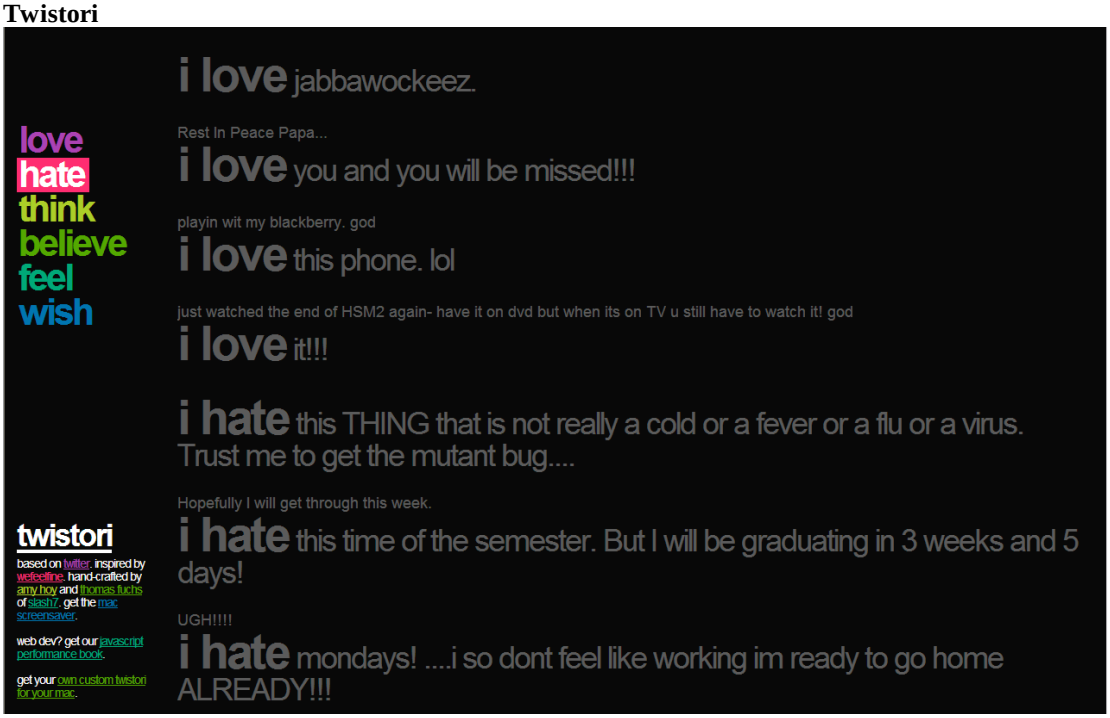


http://www.nytimes.com/interactive/2009/03/30/business/economy/2009-economy-words.html

In a world where technology enables anything, anywhere, anytime, and anyway, then appropriateness will rule the day. So it is not surprising that we are now at a moment in technological history where emotions are constantly measured, broadcasted, and even estimated. Companies are continually on a quest to push technology to its limits and suggest movies that might meet our very mood at that exact moment, deliver ads that we would love in one particular context, or even present images that might resonate with us at that time, however fleeting.

The shift from the Relational Web to the Emotional Web finds its most poignant instantiations in the applications built on top of social media themselves. Take the Facebook app HappyFactor. It aims to give "**you** the tools to learn what uniquely makes you happy. By keeping track of what you do and how happy you feel, you can have more happiness more often."[45] Twistori aggregates feelings expressed on Twitter and "presents a stream of consciousness view of the Twitter emotional landscape."[46]

Twistori



And WeFeelFine has developed a database of millions of feelings which are increasing at the rate of 20,000 new feelings each day. Using a highly creative interface, the data is represented in a very visual playful way through a series of what they call Movements divided into six categories: Madness, Murmurs, Montage, Mobs, Metrics, and Mounds.

Every few minutes, the system searches the world's newly posted blog entries for occurrences of the phrases "I feel" and "I am feeling". When it finds such a phrase, it records the full sentence, up to the period, and identifies the "feeling" expressed in that sentence (e.g. sad, happy, depressed, etc.). Because blogs are structured in largely standard ways, the age, gender, and geographical location of the author can often be extracted and saved along.

WeFeelFine

The Worldwide Web's shift to favoring more emotionally-rich content favors girls and women who tend to cultivate social networks, develop emotional

connections online, and create and decorate profile pages more than men and boys. Furthermore, the anecdotal and storytelling quality of the internet today also makes it a more girl-friendly domain. Storytelling is contingent on emotional hooks that draw the reader in. And as young girls become proficient in programming interfaces like Alice.org that promote storytelling through the use of emerging technologies, we can begin to rethink conventional strategies for increasing the participation of women in the development of technology. It is imperative to contextualize formal STEM education today as something that exists alongside the innovations brought about by the Worldwide Web's progression over 3 stages in the last decade. Education, alongside social initiatives that involve mentorship and networking opportunities, can now be combined with social media technologies that foster peer-to-peer learning.

Flickr

Conclusions

The team entered into the study with the sense of an impending emergency. We arrived at a conclusion that we are on the cusp of a global opportunity.

That *emergency* was the story told by:

- Numbers regarding female enrollment in engineering studies at the university level
- Representation of women at the board-room level within SV companies
- Share of venture capital being awarded to women entrepreneurs, and the number of women awarding it
- Share of voice by women in the traditional trade and business press as it relates to technology

Two of these trendlines are heading in the right direction, up. The academic picture continues to be problematic. As for share of voice within traditional media, not to be unkind, but it is increasingly irrelevant. That is due to the story being told by *other* numbers that we and other researchers should both pay attention to, and be encouraged by.

This emerging *opportunity* is the story told by:

- A growing body of historical knowledge, as delivered via the common repository of the Web, about how much in fact women in tech have contributed to the creation of value and technology that makes our lives better. The 'secret history' is now increasingly in the open.
- The dominant voice of girls, young women, and increasingly their antecedent cohorts, across the Emotional Web. This is documented in a growing corpus showing female mastery of social networks for programmatic storytelling.
- Accelerating use of social networks of all kinds by a new generation of GenY social media-savvy women entrepreneurs of all types – technical, social, financial – to connect with each other across generations and leverage the newly-formed convergence of all three generations here in Silicon Valley over the recent past.

The fact that our research was conducted in the context of a deepening crisis lent a certain clarity to the conversation – the lack of background noise and the hype buzz that is the daily soundtrack of Silicon Valley allowed us to listen better to the voices of Makers, Connectors, and Amplifiers (the latter we heard quite well). The Makers of the '80s -- fabricators of the networking quilt that would become the Internet – grew up amidst the global social and cultural crisis of the '60s. It is interesting to note that the growing influence of their GenX Connector successors such as Marissa Mayer, Caterina Fake, Gina Bianchini *et al* was tempered by the experiences of the dot com crisis of the early zeroes. In retrospect, much of the creative destruction of that boom/bust cycle has led to nothing less than the social networks of the Emotional Web that provide such a powerful platform for GenY Amplifiers. Today, a truly global crisis emboldens the GenY Amplifiers who increasingly see technology as a means to mobilize humanity for social change, climate change, and a more equitable planet.

Specific findings and recommendations follow, with each Finding pointing to one or more Recommendations.

Findings:

Finding #1: Social Media

- Social media is a comfortable place for women, it affords visibility, mutual support, and reinforces self-esteem. A global phenomenon in attracting the next generation of women to tech is the growing usage of social media by young women.

Associated Recommendations: R1 (see Recommendations section below)

Finding #2: Education/Information

- Women are grossly under-represented in the important field of Open Source software development today. Focusing on choices women make at the college level is at best a band-aid solution, too little too late. There appears to be a false dichotomy between CS and business Young women need support to stay interested in science starting with primary school.
Associated Recommendations: R1, R2, R3

Finding #3: Impact & Future

- Three generations of women are converging at the same time signaling a more gender and generationally-diverse workforce.

- Diversity equals superior performance. This is corroborated by additional evidence from NCWIT that mixed-gender patent teams received significantly higher citations, a key metric for innovation. The Tech industry also appears to be below average in terms of women representation on corporate boards.

- The emergence of GenY as a major segment in the workforce means a greater willingness to change careers and explore new paths. With the growing demand for tech employees through 2016, this augurs well for new opportunities for GenY in engineering and tech.
Associated Recommendations: R4, R5

Finding #4: Career & Support

- The literature examining women's participation in tech has been largely characterized by policy, cultural, behaviorial, and economic considerations, such as work-life balance. Ironically, the prism of technology has been largely absent from the critical studies. What role does technology itself play in the trajectory of tech women's careers in tech?

- Work-life issues have to be reframed, looking beyond the short-term unrealistic ideal of juggling towards a longer-term view of a sustained career

- Role models and mentors are needed early on to keep girls from being tracked out of the harder sciences, specifically computer sciences; personal experiences culled from our interviews show these are highly influential in determining career trajectories in tech.

- Silicon Valley's penchant for networking extends to this domain – a growing number of local networking events aimed specifically at women as entrepreneurs and developers have developed over the past few years, joining a few long-standing women's networking groups. Opinions are divided. Is this is a service or a disservice?, The dissenting view argues that, by "branding it pink", women are actually given exclusionary status.

- Venture Capital is seen as one of the major growth engines for Silicon Valley innovations. While the numbers seems to suggest women are under-represented in the VC firms, as well as under-funded, the team was able to identify a strong emergent network of women in VC in the Valley.

Associated Recommendations: R5, R6, R7

RECOMMENDATIONS

- R1 *Educators across all levels must explore the growing connectivity* between story-telling and programming, whether it is at the GenY level (example Alice.org) or even GenZ, where it can be argued that the massively popular Webkinz is bringing the next generation of girls in tech into playful focus. Social media is also about programmatic story-telling.

- R2 *Create viral messages* that expose girls to role models, accomplishments, and possibilities in the tech field. Utilie social media to send a strong message or call to action for inspiring girls to engage in tech.

- R3 *Promote practices such as Job-Shadowing*, where students can follow a computer scientist/engineer around to see first hand, as Marissa Mayer says, "what will my work do?" This may help address the issue of refocusing girls on tech.

- R4 *Corporate sustainability officers need to broaden their view of sustainabilit*y to understand that every investment in programs that expose girls to tech, whether they are coding camps or fellowships, is a crucial part of any corporate strategy that focuses on their long-term survival. Monocultures are bad, diversity is good.

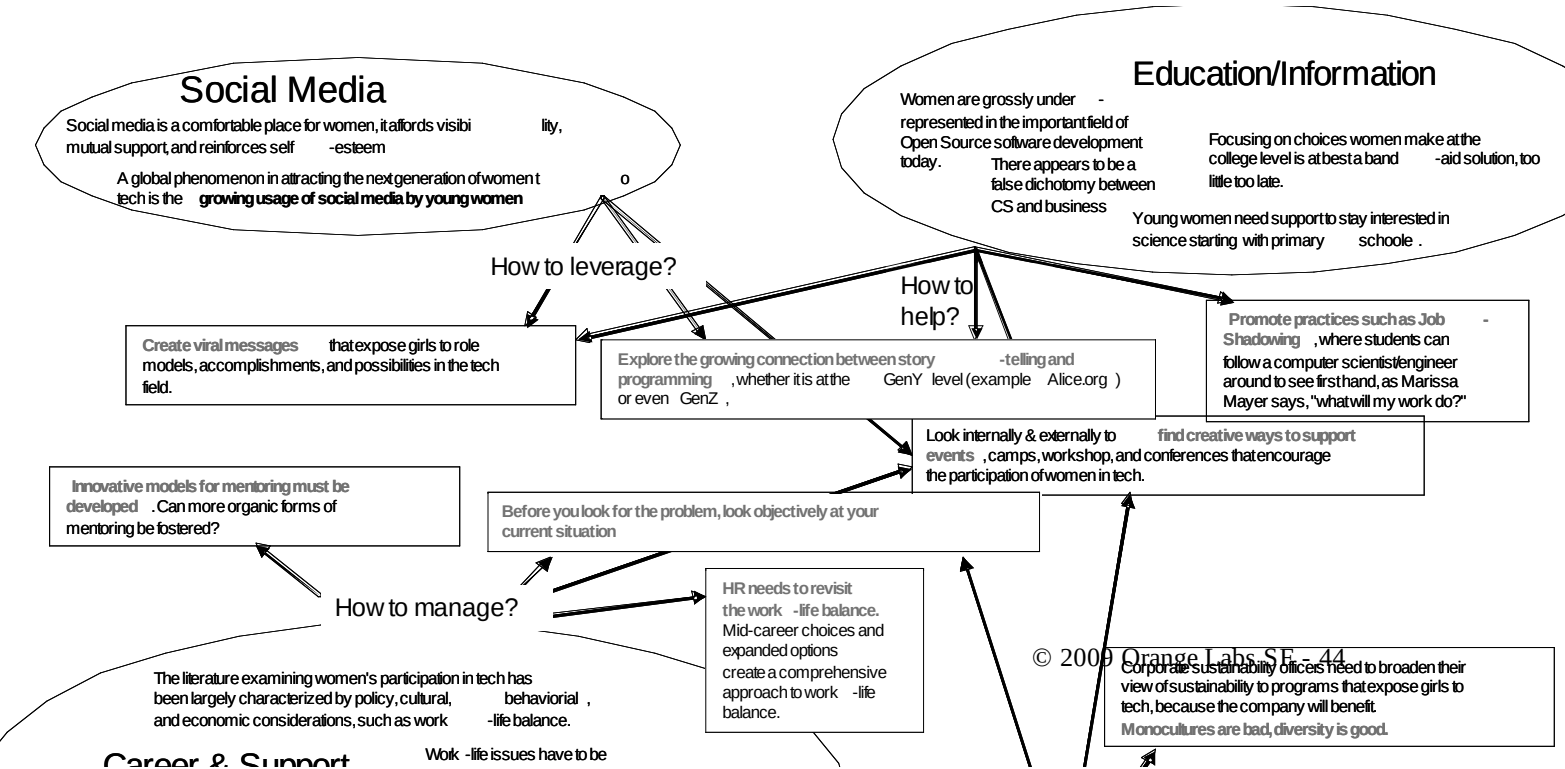
- R5 *Properly evaluate exactly where your organization stands* with respect to women's contribution to innovation. This starts not with the question "how do we fix this?", but with a clear look around at the contributions women are already making. In other words, before you look for the problem, look objectively at your current situation.

- R6 *HR needs to revisit the work-life balance*. Programs for maternity leave, work-at-home, flextime are good, but not enough. What is missing is a holistic view of women across all the stages of her contributions. Mid-career choices and expanded options for spouses are necessary elements of a more comprehensive approach to work-life balance.

- R7 *Innovative models for mentoring must be developed*. While many of the women we interviewed attested to the importance of role models and informal mentors on their career choices, we also encountered significant amounts of skepticism about formal, or imposed, mentor relationships. Can more organic forms of mentoring be fostered?

- R8 *Look internally & externally to find creative ways to support and sponsor* events, camps, workshop, and conferences that encourage the participation of women in tech. Provide space, send employees, organize panels, feed participants, donate equipment, and help publicize events to raise awareness and increase action.

Concept Map: Findings & Recommendations



Postscript: Walk the Talk

OLSF-sponsored Ruby On Rails Outreach Workshop
June 13, 2009

If You Stretch, You Reach

Frustration was the catalyst. At the Golden Gate Ruby Conference back in April 2009, Sarah Allen and Sarah Mei, both female developers, were bothered and alarmed by the under-representation of women at the event (only 6 women out 285 developers!?). Deciding it was time for a change, the two women quickly focused on stretching the objectives of the conference by reaching out to more women. They envisioned a workshop dedicated to educating women on Ruby on Rails programming.

The Back Story

They shared this vision with Bosco So, the Ruby on Rails Meet-Up organizer, and also Orange Labs employee. Bosco So thought it was a great event idea. He immediately mentioned it to the receptive ear of Mark Plakias, VP and Project Lead of the Women In Tech research project at Orange Labs San Francisco. Mark Plakias clearly saw the value of such an event and enthusiastically offered to support Sarah Allen and Sarah Mei's project.

Support is Everything

The event was advertised on devchix and SFWOW. Highlighting that it was free and that childcare was going to be available, it was no wonder that within a short span of.one week, the event was "sold out" with a long waiting list.
In just two short months after Sarah Allen and Sarah Mei first came up with their vision, 85 people (mostly women, %) gathered at Orange Labs San Francisco on Saturday, June 13, 2009 to attend the workshop. Different programming levels were separated out into 9 groups, spread out around the lab's meeting rooms. Each group teaching Ruby On Rails at its own pace, and in true Silicon Valley style, peer-to-peer.

Additional Notes & Acknowledgements

Chapter 2: Women of Silicon Valley in Context

1 http://en.wikipedia.org/wiki/Carol_Bartz
2 http://www.economist.com/people/displaystory.cfm?story_id=12926536
3 http://www.economist.com/people/displaystory.cfm?story_id=12926536
4 http://www.economist.com/people/displaystory.cfm?story_id=12926536
5 http://kara.allthingsd.com/20090210/bartz-holds-first-exec-offsite-as-the-yahoos-turn-and-twist-in-the-wind/
6 http://kara.allthingsd.com/20090220/hurricane-carol-bartz-could-announce-major-yahoo-management-reorg-next-week/
7 http://www.economist.com/people/displaystory.cfm?story_id=12926536
8 http://en.wikipedia.org/wiki/Padmasree_Warrior
9 http://www.witi.com/wire/witiwomen/pwarrior/pwarrior2.shtml
10 http://en.wikipedia.org/wiki/Padmasree_Warrior
11 http://money.cnn.com/popups/2006/fortune/womenwatch/4.html
12 http://www.mercurynews.com/business/ci_11872648?nclick_check=1
13 http://www.mercurynews.com/business/ci_11872648?nclick_check=1
14 http://www.web2summit.com/web2008/public/schedule/speaker/24447
15 http://www.witi.com/wire/witiwomen/pwarrior/pwarrior2.shtml
16 http://www.nytimes.com/2009/03/01/business/01marissa.html?pagewanted=1
17 http://www.nytimes.com/2009/03/01/business/01marissa.html?pagewanted=1
18 http://www.nytimes.com/2009/03/01/business/01marissa.html
19 http://fury.com/2009/03/google-design-the-kids-are-alright/
20 http://stopdesign.com/archive/2009/03/20/goodbye-google.html
21 http://www.sanfranmag.com/story/adventures-marissa
22 http://www.sanfranmag.com/story/adventures-marissa
23 www.stanford.edu/group/gender/ResearchPrograms/TopTech/Climbing_the_Technical_Ladder.pdf
24 www.stanford.edu/group/gender/ResearchPrograms/TopTech/Climbing_the_Technical_Ladder.pdf
25 www.stanford.edu/group/gender/ResearchPrograms/TopTech/Climbing_the_Technical_Ladder.pdf
26 http://www.more.com/work-money/work/the-world-according-to-carol-bartz/
27 http://blogs.wsj.com/juggle/2009/01/15/yahoo-ceo-carol-bartz-balance-is-a-myth/
28 http://www.ncwit.org/images/practicefiles/PatentingLearningCommunities_PromoteDiverseInnovation.pdf
29 http://www.forbes.com/2007/09/13/women-patents-study-tech-science-cz_cm_0913techwomen.html
30 http://www.forbes.com/2007/09/13/women-patents-study-tech-science-cz_cm_0913techwomen.html
31 http://www.ncwit.org/images/practicefiles/PatentingLearningCommunities_PromoteDiverseInnovation.pdf
32 http://www.ncwit.org/images/practicefiles/PatentingLearningCommunities_PromoteDiverseInnovation.pdf
33 http://www.ncwit.org/images/practicefiles/PatentingLearningCommunities_PromoteDiverseInnovation.pdf
34 http://www.nytimes.com/2008/05/15/fashion/15WORK.html?pagewanted=2&_r=2&sq=lisa belkin&st=cse&scp=5

Chapter 6: Three Generations

35 http://www.nasrecruitment.com/TalentTips/NASinsights/GettingtoKnowGenerationX.pdf
36 http://www.pewinternet.org/Reports/2009/Generations-Online-in-2009.aspx
37 ttp://www.pewinternet.org/Reports/2009/Generations-Online-in-2009.aspx
38 http://www.forrester.com/Research/Document/Excerpt/0,7211,44907,00.html
39 http://www.insidefacebook.com/2009/04/07/facebook-confirms-200-million-user-mark/

40 http://www.insidefacebook.com/2009/02/02/fastest-growing-demographic-on-facebook-women-over-55/

41 http://www.insidefacebook.com/2009/02/02/fastest-growing-demographic-on-facebook-women-over-55/

42 http://www.pewinternet.org/Reports/2008/Writing-Technology-and-Teens.aspx

43 http://www.pewinternet.org/Reports/2008/Writing-Technology-and-Teens.aspx

44 http://www.alice.org/kelleher/storytelling/index.html

45 http://www.happyfactor.com/

Photo credits:

Page 15 Carol Bartz http://www.telegraph.co.uk/telegraph/multimedia/archive/01238/bartz_1238451c.jpg

Additional resources

Ada Lovelace Day:
http://findingada.com/2009/01/05/ada-lovelace-day/
http://www.pledgebank.com/AdaLovelaceDay

http://www.facebook.com/event.php?eid=47550446005

Main Silicon Valley Communities

Women2.0: Angie Chang and Shaherose Charania co-founded this great organization that aims to increase the number of young women entrepreneurs by encouraging women to work with and in the field of technology.
Girls in Tech connects like-minded, motivated young women to swap energy, ideas, and experiences with each other.
BlogHer: In 2005 Elisa Camahort, Jory Des Jardins and Lisa Stone responded to the often repeated question: "where all the women bloghers?" Blogher was their answer, the largest online community of women bloghers to date.
Women Who Tech
Global Women's Leadership Network: dedicated to developing the leadership capacity of women who dare to transform the future of their organizations, communities, and the world.
OReillly Forum on Women in Tech http://www.oreillynet.com/womenintech/ MobileActive.org:
MobileActive is a global network of people (and their tools, projects, and resources) focused on the use of mobile phones in civil society spearheaded by Women Who Tech advisory committee member Katrin Verclas.
http://shesgeeky.org/ event in NYC early Dec 2008, event here in BA end of Jan 2009
ASTIA (formerly Women's Technology Cluster) - a community of experts committed to building women leaders and accelerating the funding and growth of high-potential, high-growth, women-led startups. ASTIA was founded by Cate Muher, former CMO of Cisco, as part of her foundation The Three Guineas Fund founded in 1994 in San Francisco to promote social equity by expanding access to economic opportunity for women and girls.

University initiatives

Myra Strober - Stanford - http://www.stanford.edu/~myras/
Stanford University's Clayman Institute for Gender Research and the
Anita Borg Institute for Women & Technology just published Climbing The Technical Ladder. Here is the news release sent out in October 2008. The Borg Institute has a Women of Vision Banquet in San Jose in April 2009. Lots of other resources at both of these institutes.

IT/Dev

Geek Girl Blogs: A great blogging community for women working in IT.
Linuxchix: Great network of women working in Linux.
WebChick.net: Angela Byron's blog about working in open source.
ROSE Blog: Rikki's Open Source Exchange: A blog that highlights women in open source.
*Systers:*One of the world's largest email communities of technical women in computing.
Women in Consulting
Techbridge is aimed at middle-school girls where the break occurs

MISC Articles

McKinsey Study: How Talented Women Thrive
Women + Personal Branding
The Glass Cliff: Are Women Leaders Set Up to Fail?
NYT Article Increasing Women on Payrolls
NYT Article on Women + Diversity
NYT Diversity + Athena Factor Review
Gender Diversity at Web Conferences: By *kottke.org*
Cracking the Boys Club: 10 Pioneers in Tech and Web 2.0: By Allyson Kapin
Most Influential Women in Web 2.0: By Saabira Chaudhuri
Women in Technology: Hear Us Roar Series: By Tatiana Apandi
Women Who Risk: Making Women in Technology Visible: By Tara Hunt
The State of Women and Technology Fields Around the World: By the Anita Borg Institute for Women and Technology
The Business Case for Gender Diversity in Technology: By the Anita Borg Institute for Women and Technology
Good Top 50 Women in Tech List - 2008
Judy Estrin's Resources Page, Great Stuff
IT in European Schools, from Orange U&I
BBC ValleyGirls Profiles several profiles here.
US National WScience Foundation *Demographic data on Degrees Granted, by Gender (thru 2005)*
Androgynous Leaders + Innovation
Androgynous Leaders Article
UC Davis Study on Women Business Leaders in California
Women in Telecom
MIT 1973 Report Women In Science + Technology
Innovative Potential: Men and Women In Teams (includes research from Orange)
Fortune Editor on Powerful Women