

# her code

Engendering Change in the Silicon Valley



# editorial

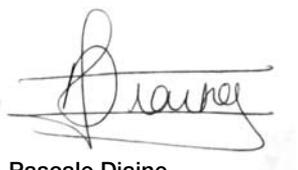
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The dearth of women in technology-related fields has been an enduring challenge. One traditionally explored via predictable frameworks - educational, governmental, and cultural. Less considered, and for some reason less obvious, is the technological dimension. We began our research into the under-representation of women in the Sciences, Technology, Engineering, & Math (STEM) fields with these frameworks. Guided by a historical perspective, enriched by interviews with high-profile women executives and journalists in tech, supplemented by interviews with young girls, and complemented by literature review and secondary research, we came to a surprising path of inquiry. What role does technology itself play in the evolution of women's career trajectories in the tech field?

The genesis of our inquiry into "women in tech" began in 2009, but it had in fact been building for a long time before that. Orange Labs San Francisco (OLSF) researchers and managers had been seeing more and more activity in the Silicon Valley ecosystem being headed up by women. Activity in the broadest sense: events, startups, influential blogs, and keynote presentations at major conferences by venture capitalists, CIOs and CTOs at companies like Cisco and Adobe, Sun and Agilent. A core group met to discuss what would be involved in a focused study examining the history, current status, and future of women in the cradle of high-tech, Silicon Valley.

The phrase "women in tech" has many facets to it. Our research team has taken a broad interpretation of the phrase, and offset this with a strong focus on Silicon Valley, where the Orange Labs San Francisco facility regularly hosts interactions with the ecosystem, as well as maintains an active schedule of attending external events and engaging with the Silicon Valley tech community. Indeed, the growing number of networking events designed around the "women in tech" theme in this area was one impetus for conducting the study. The broad definition of "women in tech" encompasses over 30 years of activity in multiple disciplines including Academia/Education, Engineering, Product/Industrial Design, Marketing, & Management/Finance.

The primary mission of Orange Labs SF is to extract and interact with the Silicon Valley ecosystem in order to drive innovation that benefits and aligns with FTGroup's strategic objectives. The findings of this research has wide-reaching implications for the FTGroup, from an organizational & human resource perspective to strategic product development considerations. What does it mean for a company to encourage a more diversified workforce not just by gender but by generation as well? Furthermore, how does product design and development impact girl's and women's use of technology itself? We discovered that not only was it necessary to add a technological dimension to the under representation of women in tech but it was even more critical to go beyond that. We realized, given what we had been seeing in Silicon Valley, that it was the convergence of the technological, the generational, & the social that needed to be more clearly understood and explored. Through graphs, quotes, statistics, historical data, & analysis, this magazine illustrates the evolution of this convergence and articulates just what it means to be a "woman in tech" today and tomorrow.



**Pascale Diaine**  
*Evangelist*  
Orange Labs San Francisco



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Pascale Diaine doing field work for the report at the SD Forum Teens in Tech conference.

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# miss-ing or miss-understood?

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## miss-ing

11.8%

of Computer Science bachelors degrees are awarded to women.

25%

of proprietary software developers are female.

8.5%

of Silicon Valley companies have a female board director.

4.3%

of venture-funded companies are run by women.

2%

of Open Source developers are female.

Sources for this page:

<http://www.cra.org/info/taulbee/women.html>

<http://www.computerworld.com/action/article.do?command=viewArticleBasic&articleId=103777>

<http://www.spencerstuart.com/about/media/53/http://www.cra.org/info/taulbee/women.html>

[http://www.siliconvalley.com/vcsurvey/ci\\_5873541](http://www.siliconvalley.com/vcsurvey/ci_5873541)

## miss-understood

70%

of girls aged 15-17 have a profile on a social network.

of web users aged 12-17:

75%

more girls blog than boys.

Facebook's fastest growing segment is women over 55 years, up

175%

since September 2008.

45%

more girls create web pages than boys

56%

of Facebook's 200 million users are female

Sources for this page:

<http://www.insidefacebook.com/2009/02/02/fastest-growing-demographic-on-facebook-women-over-55>  
<http://www.nytimes.com/2008/02/21/fashion/21webgirls.html> (data from Pew study mention in rpt)

# it all started in 1842

1846

**ADA LOVELACE**, the daughter of English poet Lord Byron, is widely credited with creating the FIRST COMPUTER PROGRAMS for a then still-hypothetical computer, Charles Babbage's Analytical Engine. In a monograph about Babbage's idea for an 'Analytical Engine,' Ada added ideas on how to use the machine for calculating sequences of Bernoulli numbers – the first program. In 2009, International Ada Lovelace Day was held to elicit thousands of posts from women all over the world about their role in tech.



1959

**GRACE HOPPER** created the FIRST COMPILER FOR THE HARVARD MARK 1. She specified the world's first programming language, COBOL, in 1959, formally standardized a decade later in 1968.



1972

**KAREN SPARCK JONES** published the concept of INVERSE DOCUMENT FREQUENCY which serves as the cornerstone for most search engines to this day. Most of us incorrectly associate two Stanford drop-outs who went on to start a company called Google as the defining moment in search.



1940

ENIAC is generally recognized as one of the world's first programmable computers. The first six 'programmers' for ENIAC were all women. This team was taught by **ADELE GOLDSTINE**, who authored the industry's first user manual, ENIAC'S OPERATORS MANUAL.

1968

**BARBARA LISKOV** became the first woman in the US to receive a PHD DEGREE IN COMPUTER SCIENCE (CS), in the cradle of many computer-related innovations to come in Silicon Valley, Stanford University.



1999

**MARISSA MAYER** spurns high-paying consulting gigs to join small startup Google as their first female engineer; today she serves as a VICE PRESIDENT.



2009

**CAROL BARTZ** becomes CEO OF YAHOO! In 1992, computer-aided design firm Autodesk brought in Bartz (at the time a high-powered Sun executive) to help grow the company. Over the next decade Bartz transformed Autodesk into a diversified tech powerhouse that grew by a factor of 10 during her tenure.



1988

**EVA CHEN** CO-FOUNDED TRENDMICRO. Today it is a multi-billion dollar security software firm.



1998

**MEG WHITMAN** joins EBAY AS PRESIDENT. Under her watch, eBay goes public and delivers 40 consecutive quarters of revenue growth.



1982

**PADMASREE WARRIOR** started as an engineer at Motorola in 1982 and today serves as the CTO FOR CISCO – a company co-founded by another woman!



1984

**SANDY LERNER** and Len Bosack, two Stanford University IT engineers, started CISCO SYSTEMS in their living room.



1989

**ANN WINBLAD** (after founding a successful software company with \$500 in 1976 and selling it six years later for \$15 million) co-founded, with John Hummer, the first venture capital firm in Silicon Valley focused exclusively on software companies. Her firm launched some of the very first tech IPOs in the industry.



1999

**CARLY FIORINA** becomes CEO OF HEWLETT-PACKARD, where she is instrumental in executing the merger with Compaq.



2004

**GINA BIANCHINI** CO-FOUNDS social networking site NING, which has raised over \$100 million in funding while boasting in excess of 1,000,000 custom social networks and millions of unique visitors.



2004

**CATERINA FAKE** CO-FOUNDS popular photo-sharing site FLICKR, which is sold to Yahoo! one year later for \$35 million.



OLDER SISTER  
MAJORETTE  
HOMECOMING QUEEN  
CHEERLEADER  
GEEK  
SECRETARY  
BANK TELLER

COCKTAIL WAITRESS  
COMPUTER SCIENTIST  
FOOD SERVER  
STUDENT  
WIFE  
SYSTEMS ANALYST  
SALESPERSON

MOTHER  
BREAST CANCER SURVIVOR  
GARDENER  
BOARDMEMBER  
VOLUNTEER  
VICE-PRESIDENT  
CEO\*

# Yes she can!

## from simultaneity to longevity

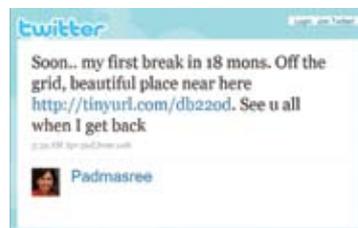
Work-Life Balance does not only vary woman-to-woman but generation-to-generation. By accepting the diversity of lives of career women in tech, we can start to imagine small acts of balancing in everyday life rather than an all encompassing "Balancing Act" fit for all women. For companies this means managing a workforce of three generations of women at different life stages and different expectations about what balance really means. It is in the mid-stage of life that many women and companies feel this need for balance most acutely. For many successful tech women, like Carol Bartz and Padmasree Warrior, the key is a long-term view of their careers. Instead of balancing for simultaneity (having it all, all at once) they instead strive for longevity in having both a successful career and a healthy personal life.

**"For many women, building a career, partnering, and raising a family are not simultaneous life events."**

## staged realities

Women at the mid-level of their tech careers are most vulnerable to work-family issues. The mid-level stage of women who work in the technology sector also coincides with the time when the greatest proportion of them would be considering having children. Highlighting the gendered realities of work, a 2008 report from Stanford University and The Anita Borg Institute found that, amongst mid-level technical workers, women

delayed having children at the rate almost double that of their male counterparts and have foregone having children at an even higher rate of almost triple that of men. The Household Characteristics' chart clearly shows the disparity in household and childcare responsibilities that influence women's decisions about being a parent.



Padmasree Warrior, CTO of Cisco, has 542,000 followers on Twitter. Adept at using Social Media, Warrior tweets about her long overdue vacation.

\* All of these roles and job titles refer to Carol Bartz at some point in her life.  
\*\* [www.stanford.edu/group/gender/ResearchPrograms/TopTech/Climbing\\_the\\_Technical\\_Ladder.pdf](http://www.stanford.edu/group/gender/ResearchPrograms/TopTech/Climbing_the_Technical_Ladder.pdf)  
\*\*\* <http://www.more.com/work-money/work/the-world-according-to-carol-bartz>

“They think, ‘I’m going to cook a great breakfast, wash up the dishes before I leave, take the kids to school, call my college roommate on my



way in to work, be a CEO all day, volunteer on the way home, do a little exercising, cook a wonderful dinner, help with homework, have sex’ . . . I don’t think so.”

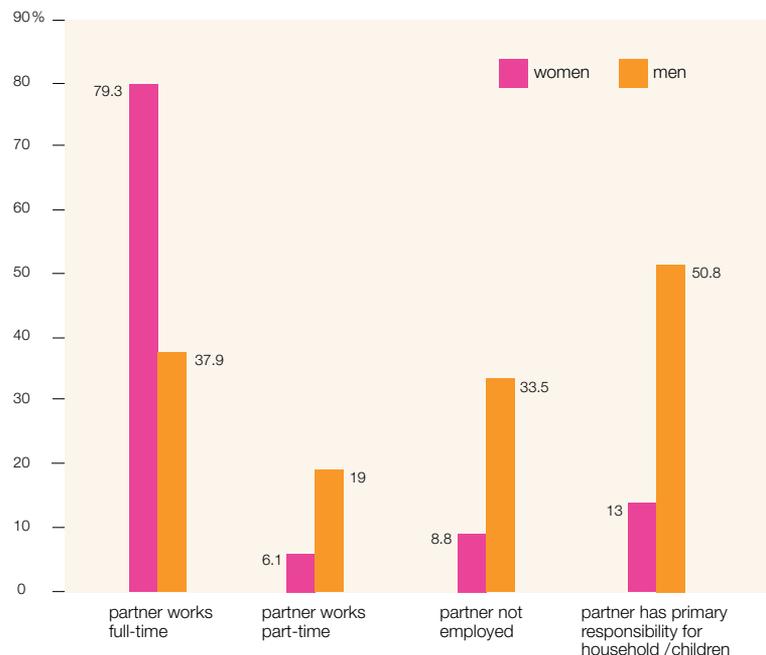
— Carol Bartz

## one x one

According to Bartz, these pressures often manifest themselves in the form of useless guilt. In fact, she has said on numerous occasions that work/life balance is “myth” and is counterproductive. In an interview with *More* magazine, Bartz condemned the “myth of the balanced life . . . Women put all this crap on themselves,” she says. Believing that daily balance is an impossible thing to achieve, she advocates a more long-term view and proposes that women focus on doing one thing at a time and

doing it well, instead of trying to juggle too many things at once. For Padmasree Warrior, CTO of Cisco this means a compartmentalized life which involves long weekly commutes between Silicon Valley and her home in Chicago where her husband and son live. While at work she focuses on work and while at home it’s all about her family. Now if she could only squeeze more vacation time somewhere in between!

## household characteristics of partnered mid-level technical workers, by gender



Source for above chart:  
[www.stanford.edu/group/gender/ResearchPrograms/TopTech/Climbing\\_the\\_Technical\\_Ladder.pdf](http://www.stanford.edu/group/gender/ResearchPrograms/TopTech/Climbing_the_Technical_Ladder.pdf)

# 3(G)enerations

amplified individuals + the emotional web

# 3G

From the R&D Lab to the office floor to the boardroom, Baby Boomers, Gen X, and Gen Y are now converging and working together everyday. 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.[i] Gen Y were born between 1977 – 1995 and include a particular cohort often referred to as Millennials 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.

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.

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.

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.

## generations explained

GENERATION NAME	BIRTH YEARS, AGES 2009	% OF TOTAL ADULT POPULATION	% OF INTERNET-USING POPULATION
GenY (Millennials)	b. 1977-1990, 18-32 yrs	26%	30%
GenX	b. 1965-1976, 33-44 yrs	20%	23%
Younger Boomers	b. 1955-1964, 45-54 yrs	20%	22%
Older Boomers	b. 1946-1954, 55-63 yrs	13%	13%
Silent Generation	b. 1937-1945, 64-72 yrs	9%	7%
G.I. Generation	b. -1936, 73+ yrs	9%	4%

Source for above chart: Pew Internet & American Life Project December 2008 survey, N=2,253 adults, and margin of error is +/-2%. N=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 book, *Generations*; Strauss, William & Howe, Neil. *Generations: The History of America's Future, 1584 to 2069* (Perennial, 1992). As for Older Boomers, enough research has been done to suggest that the two decades of Baby Boomers are different enough to merit being distinct generational groups.

Note: There are varying opinions (ranging between 1990-1995) as to when Gen Y ends and Gen Z begins.

# 3G 3(G)enerations converging & amplifying the emotional web

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## engendering change

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In Silicon Valley, three generations of women have contributed to the evolution of the Internet. The Boomer women helped to invent the basic technical bricks behind today's Internet, and focus on core utilities such as email. The GenX women of Silicon Valley co-created the World Wide Web and connected it to the world we all live, work, shop and play in, by using 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 the contributions of the preceding generations.

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. For the most part, this incredible growth has been fueled by the participation of women. As of February 2009, women are the majority in every age group category on Facebook. The segment of Women over 55 are growing at the fastest rate, up 175% during the period Sept08-Feb09.

Overall, the Facebook audience is comprised of 56% women. 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.

## make, connect & amplify

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A clear parallel exists in the trajectory of the web and the women who work in the technology field. In its 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. Here we find women who used their engineering degrees to invent the basic building blocks that would lead to today's Web.

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. GenXers as Connectors keenly understand the utility of social media and social networks to the consumers they deliver products to.

Today, in its third stage, the Emotional Web is marked by a highly expressive state, where emotions, status, 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. Today, creative GenY engineers 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.

Sources for this spread:

<http://www.forrester.com/Research/Document/Excerpt/0,7211,44907,00.html>

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

## emotional development

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 focused on real-time expression.

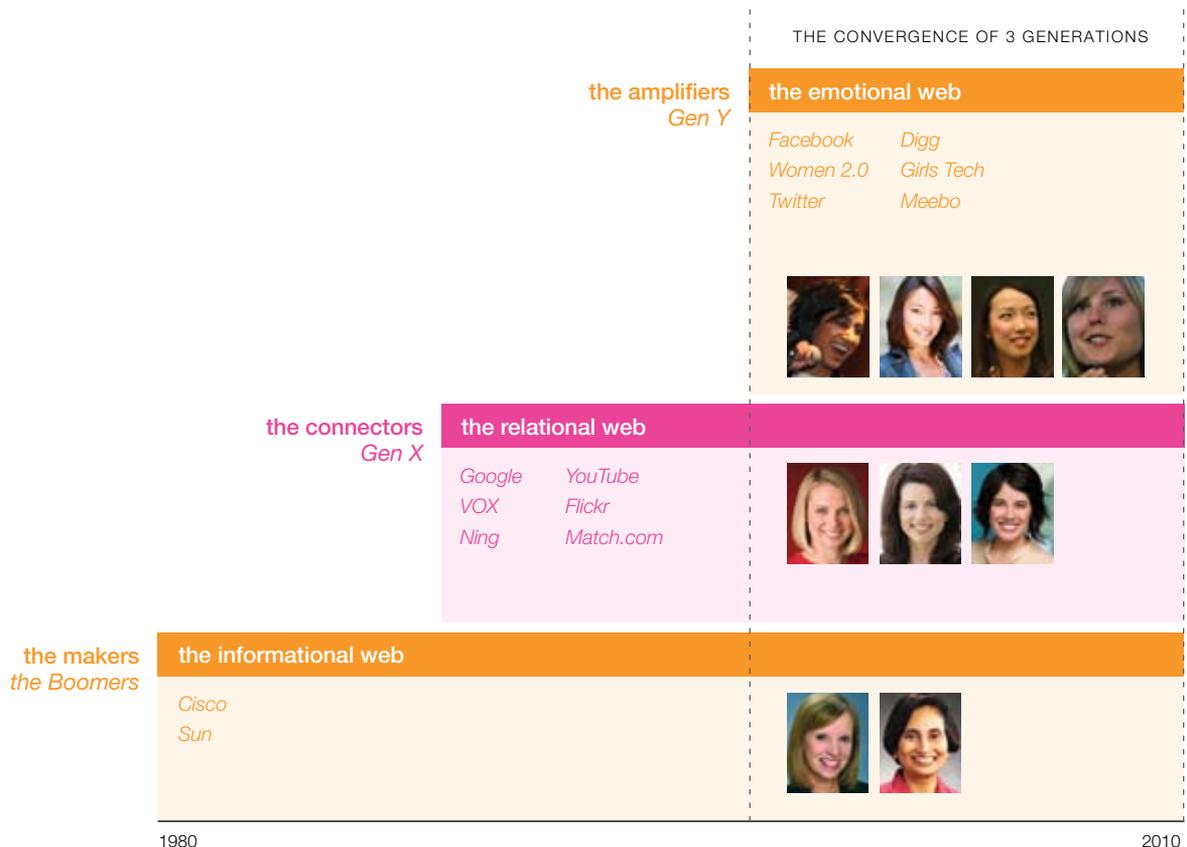
Look at any number of social media tools today and you will see that almost all of them solicit some sort of expressive input from the user. From Twitter asking "What are you doing?" to Facebook's "What's on your mind?" Similarly, video recommendation engines attempt to tap into people's moods to deliver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

In a world where technology enables anything, anywhere, anytime, and anyway, then appropriateness will be key. So it is not surprising that we are now at a

moment in technological history where emotions and moods 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 for example Twitsori which aggregates feelings expressed on Twitter and "presents a stream of consciousness view of the Twitter emotional landscape." Or 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." Twistori aggregates feelings expressed on Twitter and "presents a stream of consciousness view of the Twitter emotional landscape."

## 3 generations converging





# PITCH CONNECT INNOVATE

*with style*



Silicon Valley initiatives that  
bring change

Silicon Valley is famous for its endless and “always on” networking activity, but most of the time the male-female ratio is incredibly low. Nobody really knows why there aren’t more women in the local tech industry but whatever the reason some individuals have decided to change that.

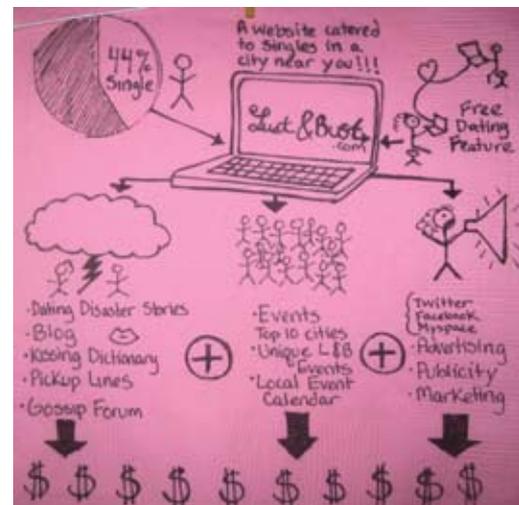
Networking events specifically targeting women have recently become more popular and women are encouraged to break the stereotype of the geek with thick glasses and a pocket protector. Several organizations are trying to promote women in technology, encourage them to join the world of entrepreneurship and provide a support network to build the confidence needed to follow through in a tech career.

**Upper Right**  
Napkin from the Women 2.0  
Napkin Business Challenge.

## women 2.0

Women 2.0 co-founded by Shaherose Charania in April 2006 is committed to increasing the number of women entrepreneurs by providing the resources, network, and knowledge for the launch and growth of their company.

They put together networking events and conferences throughout the year like Jumpstart Your Startup workshop series helping women bringing their business idea to reality. They are trying to be a catalyst for change, mobilizing a global



community of ambitious women entrepreneurs seeking to advance the world through technology. Part of the workshop series was the “Napkin Business Challenge” where participants were asked to submit their innovative business idea on a 7X7 inches napkin.

The third-annual Women 2.0 Pitch 2009 took place on May 7th 2009. A selection of female entrepreneurs was invited to pitch to a live audience and a judging panel including distinguished start up CEOs, bloggers, investors and corporate executives.

**“It is important to embrace femininity, to embrace girliness. Too many women think they need to be more like men to succeed.”**

## girls in tech

Girls in Tech hopes to bring more women into the tech industry through networking, roundtables, and entrepreneurial workshops. And only women are invited.

“When women get together we can connect on a deeper level than if men are around,” says Adriana Gascoigne, founder of Girls in Tech. “It helps to build confidence and it helps to create stronger relationships.” A lot of women in tech tend to try to blend in, they dress in a similar manner to the men, and they behave in a similar way but this is a mistake she says.

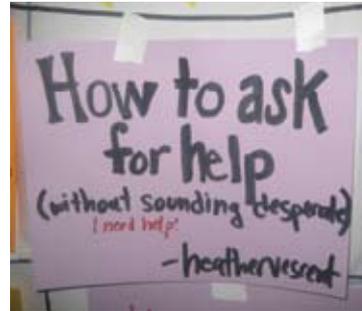
“It is important to embrace femininity, to embrace girliness,” says Adriana. “Too many women think they need to be more like men to succeed.”

## she's geeky

She's Geeky is an (un)-conference also targeting the female tech market. With five instances since the first event in October 2007, She's Geeky gathers the diverse range of women who identify as “geeky” with the opportunity to spend time together and learn from one another.

“When we called the first conference in the summer of 2007, there was a lot of conversation about the role of women in the industry and the lack of acknowledgment and paths for advancement, particularly outside the formal corporate sector in Web 2.0 and Open Source. We wanted to create a safe (women only) space to talk about the issues, strategize around cultural change, and if needed find personal support,” says Kalya, the organizer Wall Agenda at the She's Geeky conference.

She's Geeky is built on the “un-conference” format: open to everybody and without a formal agenda but rather a wall agenda with ad hoc sessions. Participants become the speaker, moderator or facilitator of a session by posting a description of the topic they want to address.



Wall agenda at the She's Geeky conference in Mountain View in January 2009.

Sessions titled “Getting more women involved in the Mozilla and Open Source community,” “How to ask for help without sounding desperate” or “Women: Leadership, Role Models, Mentors” took place at the She's Geeky conference in the Bay Area in January 09.

She's Geeky celebrates any women interested in technology: developer, designer, user experience expert or architect. Other initiatives take a more specific approach.

## Existing Communities



women 2.0



### SD forum

starting early – growing the pool of future women engineers

SDForum is a Silicon Valley not-for-profit organization gathering 12,000 software professionals annually through more than 20 events each month covering topics from digital media to cloud computing. SDForum has a Tech Women's Program offering developmental activities focused on empowering women in technology and encouraging girls to pursue education in science, technology, engineering or math (STEM) that will prepare them for a broad range of career opportunities.

A Tech Challenge is organized every year, open to kids in grades 5-12 signing up in one of the 3 divisions (Elementary School, Middle School or High School) to build a solution to a design challenge. Northrop NGC along with HP employees Jennie Hou and Susan Kelleher play an active part in sponsoring and helping Sunnyvale Middle School girls to put teams together. This a great hands-on learning experience where girls apply math, science and creativity, the long term goal being to grow the pool of women engineers.

### role models and social media

As Shaherose Charania points out in her interview with OLSF, there 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 to." VC Tim Draper and Dave McClure both agree that female role models are needed in the tech industry, making it easier for girls to identify themselves with women, and understand their successes and day-to-day life. "Doing postings on Facebook, Tweeting about it or posting videos on YouTube that are accessible to everybody. That is the best thing you can do with social media to create role models and have access to information" concludes Shaherose.

### informal mentoring

Mentoring is key when it comes to giving girls guidance and cultivating self confidence in the tech world. Initiatives like the Society of Women Engineers are trying to initiate and organize mentoring cross generationally. However, Clara Shih, writer of the Facebook Era and rising employee at Salesforce.com, mentioned in her interview with OLSF that the best mentors she had were informal. When you try to allocate mentors to mentorees, the chemistry or personality compatibility may not be there. Frances Allen, math teacher, computer scientist and first woman to be named IBM Fellow, Honoree at the 32nd Annual Exploratorium Awards Dinner Honors "Women in Science," explained that when she was a teacher, she would hang out in the cafeteria and sit down with the students who looked like they had a bad day, and ask them how she could help. Marissa Mayer, also Honoree at the Women in Science Dinner, recognized her programming professor as one of her mentors. He would organize coding contests and invite the best participants to a BBQ at his place.

# LITTLE MISS CS-Shine

## GENZ + SOCIAL CONTENT

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**“Reach out to young women and give them confidence in an area like technology by holding coding contests.”**

— Sarah Lacy *Columnist*  
**Business Week and TechCrunch.com**

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**“With technology being so pervasive in our lives, young girls are using Facebook, Twitter, and Google. I’d like to think that will ultimately shape how they’d like to spend their time and what kinds of professions they’ll consider later on.”**



— Marissa Mayer, *VP of User Experience*  
**Google**

At the critical ages of 12-16, traditional educational institutions are not supporting girls with an interest in science. Recent studies by the Pew Trust as well as the MacArthur Foundation strongly suggest that the importance of social media to future technology careers for 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.

In fact, when we look at the statistical data, we find that the vibrant leadership in the adoption of social media by the next generation of women reverses the long-standing under-representation of women in tech. This strong 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. 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 and shared as objects. In this peer-based learning model, the exciting convergence of the social web with content generation tools has enabled GenY & Z girls to help other girls make the leap from content-creation to coding at the same time the concept of ‘coding’ is evolving.

As girls increasingly utilize software platforms like Alice.org and Ning, 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 documented by Orange Labs researchers in Silicon Valley from today’s leading women technologists and young women, it seems truly inevitable that today’s wave of networked girls will shift tomorrow’s technology paradigms with their storytelling.

## education, emotion + evolution

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The Worldwide Web's shift to 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 of the GenZ generation (born after 1995) become proficient in programming interfaces like Alice.org and social networks like Club Penguin and Webkinz 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.

## from url to irl

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Interviews conducted by Orange with GenZ girls and both young women geeks and veteran career women working in the technology field in the Silicon Valley highlight the importance of support, community, and role models in addressing this issue. With Silicon Valley also being the cradle of the Social Web, Orange researchers were exposed to a convergence of powerful factors that were at once technological, generational, social, and emotional. Witnessing the symbiotic relationship of these factors made it evident that what URLs girls and women frequent online, be it social or virtual, have important IRL (In Real Life) implications. Just as IRL networking activities are mediated via online networks such as Women2.0 and GirlsInTech, so too are real-life learnings induced by Gen Z girls taught by their peers via social networks and virtual worlds. Thus, thinking of all those young GenZ girls across the country, sleeping quietly surrounded by their cuddly Webkinz pets, blurring the real and the virtual in their dreams, becomes a powerfully poignant image.

**“Last year I attended a summer camp called “BizSmart” and it really taught me how to develop my ideas and come up with a business plan. With all of that knowledge, I was inspired to start a company and really make a difference.”**

— Anika Ayyar (13 years old), founder Skip-a-Birthday

### Sources for this spread:

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# engendering change

## 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.

## 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.

## career & support

The literature examining women's participation in tech has been largely characterized by policy, cultural, behavioral, and economic considerations, such as work-life balance. Work-life issues have to be reframed, look 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. Venture Capital is the major growth engine for Silicon Valley. We find a strong emergent network of women in VC in the Valley. 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.

## impact & future

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



*leverage*  
**social media**

**Explore the growing connection between story-telling and programming**, whether it is at the GenY level (example Alice.org) or even GenZ.



**Create viral messages** that expose girls to role models, accomplishments, and possibilities in the tech field.



*help*  
**educate & inform**

Look internally and externally to **find creative ways to support events, camps, workshop, and conferences** that encourage the participation of women in tech. *We gave it a try!*  
*See next page.*



**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?"



**Before you look for the problem, look objectively at your current situation**



*anticipate*  
**impact & future**

Corporate sustainability officers need to broaden their view of sustainability to programs that expose girls to tech, because the company will benefit.  
**Monocultures are bad, diversity is good.**



# Orange Labs San Francisco gets involved!

## Ruby on Rails Outreach Workshop for Women

at Orange Labs, June 13th 2009



RoR set up session for every laptop

**“Thanks so much, it was a terrific help! I can't wait to start exploring my new skills and software tools! ”**

— Elise, a workshop participant

### 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 of 200 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 Senior Software Engineer at Orange Labs. Bosco

thought it was a great event idea. He immediately mentioned it to the receptive ear of Mark Plakias, VP and executive sponsor 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 (women's developer organizations). 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 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 Ruby On Rails Outreach Workshop for Women. 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.



Group Picture at the RoR workshops at Orange Labs in June 2009

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