



# Disrupting Tech's Diversity Problem

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## I. Introduction

Since the 1970s, women have made significant gains in the workforce in terms of educational attainment and labor force participation. Despite such progress, gender disparities in the American workplace continue to persist. On average, women who work full-time today earn 78 cents on every dollar earned by men (White House Council of Economic Advisers, 2014). While women make up half of the total US labor force, few female executives are represented among leadership ranks across public offices and corporate boardrooms. In traditionally male-dominated fields such as tech, gender bias manifested throughout the hiring and promotion process poses an even more acute challenge to female employees in their career advancement. This report examines the patterns of bias women face in the workplace, particularly among technology-oriented companies. We further review the approaches in helping women, their male colleagues, as well as the institution, to identify and remove these biases.

## II. Women's Leadership Gap

While women make up half of the number of jobs in management, professional and related occupations in the United States, they represent only 9 percent of the top management positions (Warner, 2014). The number of female executive officers among Fortune 500 companies has stagnated at 14.6 percent in the past five years, while only 24 women currently – roughly 5 percent – hold Chief Executive Officer post among these largest firms (Catalyst, 2014b, 2015b). Women perform slightly better in the corporate boardrooms holding 19 percent of the board seats (Catalyst, 2015a).

### Women Are Perceived as Effective Leaders as Men

In terms of public opinion, the majority of Americans believe that women are as equally capable of being good leaders as men. According to recent surveys, most Americans don't distinguish between men and women among the essential attributes of good leadership; while some believe women have an advantage over men in certain key areas, such as working out compromise, being honest and ethical, providing fair pay/ benefits, and offering mentorship to young employees (Pew Research Center, 2015). Men, on the other hand, are perceived as being more willing to take risk. Among the top reasons for the short supply of women in leadership positions, four out of ten Americans believe that women are often held to a higher standard in proving themselves than their male counterpart (Pew Research Center, 2015). Others point to the lack of readiness among companies to hire women for top positions and voters to elect women to higher public offices.

A report by the consulting firm Zenger Folkman sheds light on perceived female competencies as leaders. Among surveys of 7,280 leaders on feedback collected by the leader's peers, bosses, and self-assessment reports, judging their overall effectiveness, women were rated "as better overall leaders than their male counterparts [at every level] – and the higher the level, the wider the gap grew" (Zenger Folkman, 2012). While women scored higher among "nurturing" competencies (i.e., displaying high integrity and honesty, developing, inspiring and motivating others, collaboration and team work), women also outscored men with significant margins in taking initiative and driving for results. Interestingly, these qualities have long been thought as particularly male strengths.

Among peer reviewed research, studies have shown that when it comes to being perceived as effective leaders women are viewed as capable as men – sometimes higher in certain areas. When studying 99 independent samples from 95 studies, Paustian-Underdahl, Walker, & Woehr (2014) found that men and women did not differ in perceived leadership effectiveness when all leadership contexts were considered (e.g. time of study, study setting, organization type, and leadership level). Analyzing

only ratings submitted by others, women were seen as more effective leaders than men in middle and upper-level management positions. As with self-ratings (as opposed to other-ratings), men rate themselves as significantly more effective as women rate themselves. The researchers attribute some of the effect to the “double standard of competence” that often holds women to a higher standard in proving their competence in top positions.

## **The Business Case for Workplace Diversity**

Many studies have linked workplace diversity with increased organization’s performance by leveraging women’s talent to improve organizational excellence, building reputation, driving innovation, increasing team productivity, and improving the company’s bottom line (Barker, Mancha, & Ashcraft, 2014; Catalyst, 2013).

McKinsey’s study, “Women Matter,” first published in 2007, demonstrated the correlation between higher proportion of women’s participation in management teams and the company’s organizational excellence and strong financial performance (Desvaux, Devillard-Hoellinger, & Baumgarten, 2007). Even though direct causation could not be established, the significance was striking. The authors later established in a subsequent report that leadership behaviors (e.g., “inspiration,” “participative decision making,” “expectation and reward”) contributed by women in top management were the main drivers for the superior performance and regarded as effective in maintaining company’s competitive edge in the future (Desvaux & Devillard-Hoellinger, 2008).

Gender diversity among board members can have a positive impact on firm’s performance, especially when it reaches a critical mass of 30 percent of women (Joecks, Pull, & Vetter, 2013). Companies with the most women board directors outperform those with the least by 16 to 26 percent on return on sales (ROS) and return on invested capital (ROIC), respectively (Carter & Wagner, 2011). Particularly, when firm thriving for innovation the greater women’s participation in top management, the higher market value it generates (Dezso & Ross, 2012).

## **III. Where are the Women in Tech?**

Women have made significant inroad in the American workforce, yet progress is slow and uneven across industries. Women continue to make up the majority of people employed in education, health care, and service occupations, while men dominate in construction, mining, and utilities.(U.S. Department of Labor, Women’s Bureau, 2013). High-tech, in particular, is an industry where women continue to be vastly underrepresented. The gender share of women employed in information and technology (IT) occupations is below average ranking anywhere between 7 and 40 percent among computer network engineers to web developers (Figure 1) (Women’s Bureau, 2013). In non-traditional occupations<sup>1</sup>, women face particular challenges in their career advancement not only due to the lack of female representation among senior management teams, but the pro-male biases resulting from the less diverse employee pool.

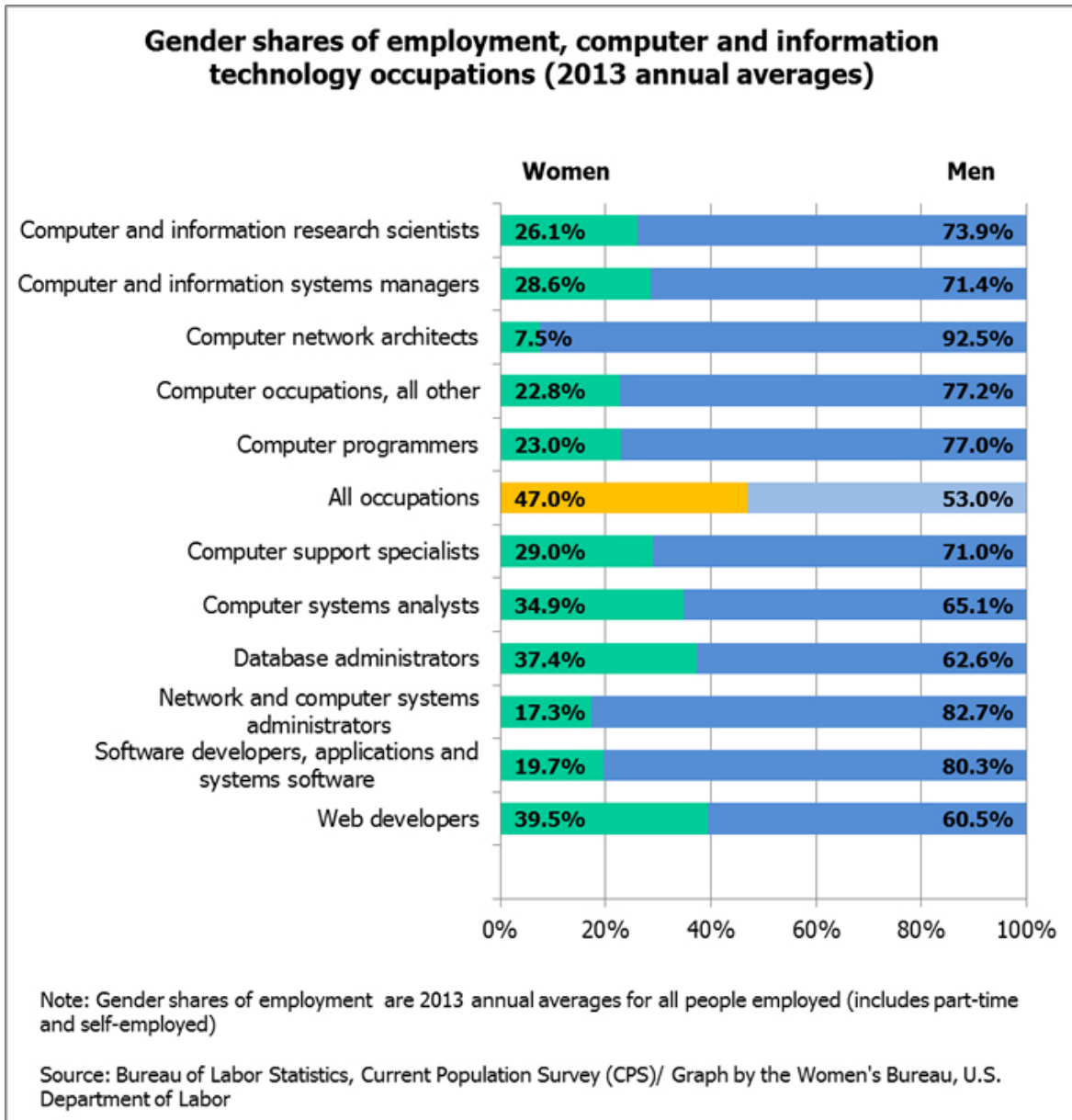
### **Where Do Tech-Companies Rank in Their Diversity?**

During summer 2014, Google was among the first major technology companies to release its diversity report. The less than stellar number of women among Google’s employee sparked a wave of discussion and prompted other technology companies, including Yahoo, LinkedIn, Facebook, Twitter, to

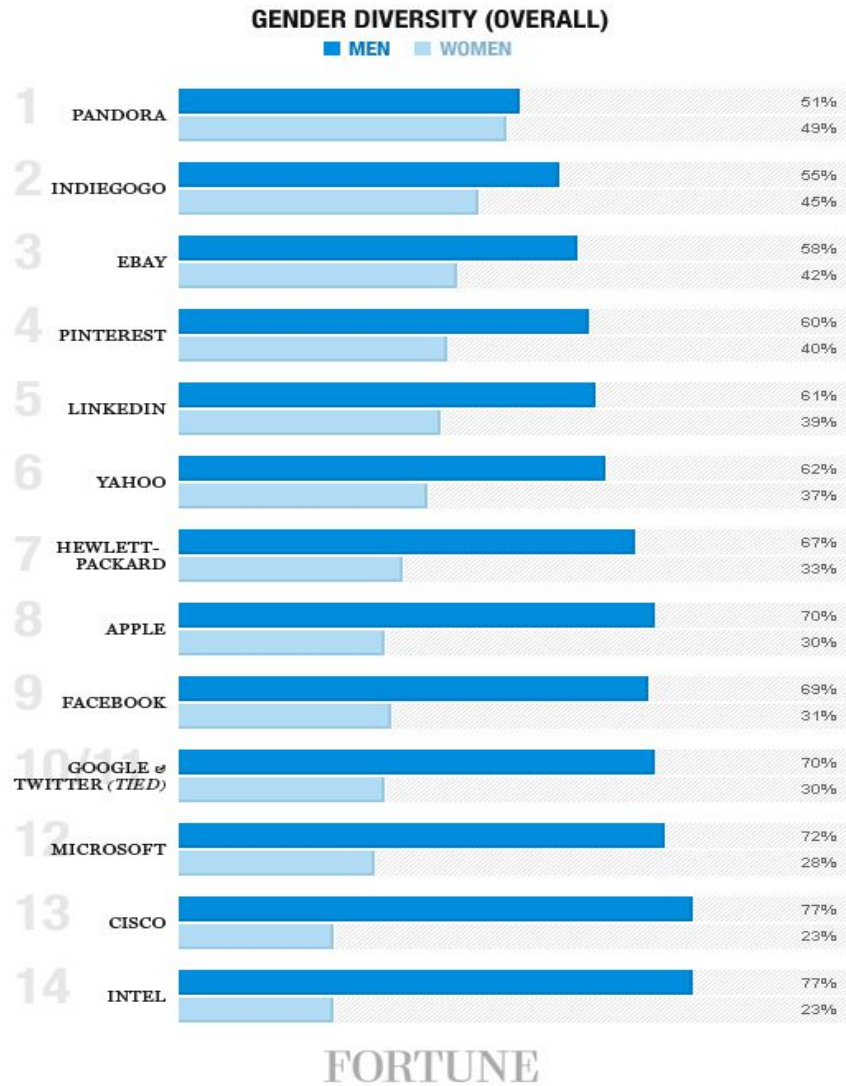
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<sup>1</sup> Non-traditional occupations are those in which women comprise 25 percent or less of the total number of workers employed.

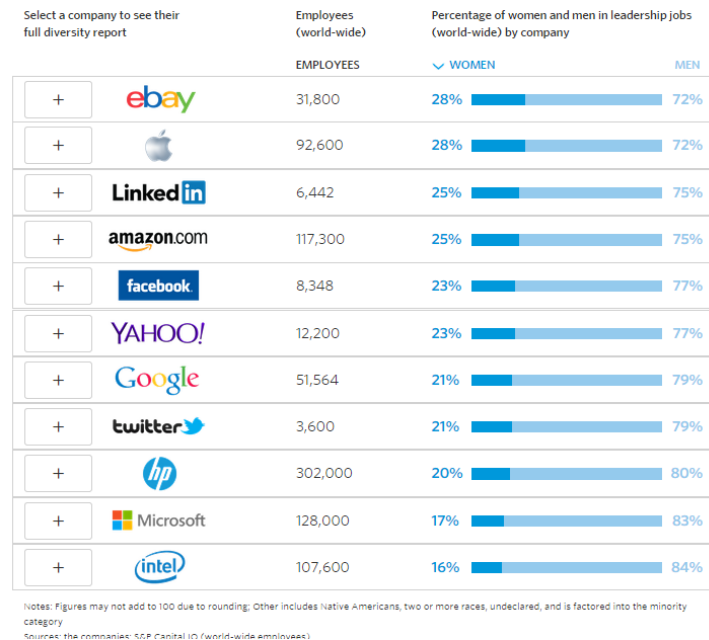
follow suit. Across the board, men make up between 60 and 70 percent of the total number of employees (Figure 2). On the other hand, there are few women in both technical and leadership positions (10 to 15 percent on average), and even fewer are Hispanics or African Americans (Lightner & Molla, 2014) (Figure 3 & 4). Notably, smaller tech companies such as Pandora and Indiegogo boast an impressive 49 and 45 percent female employees, respectively (Mangalindan, 2014). On the downside, when it comes to ethnic diversity among its employees, both companies fare much worse than other larger tech firms.



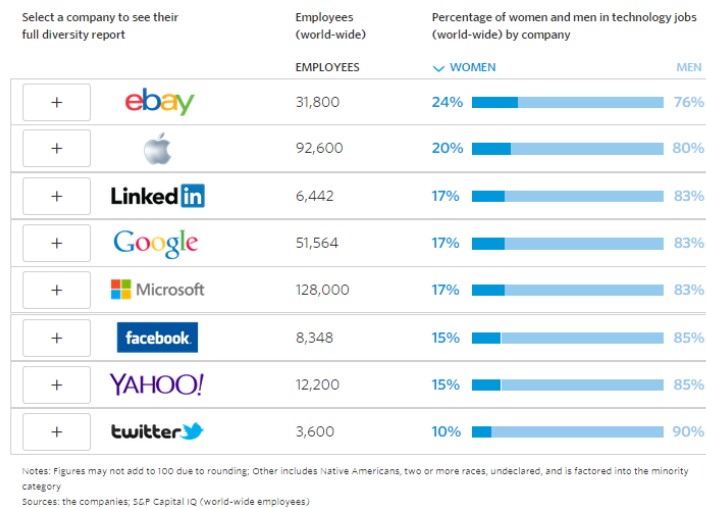
**Figure 1** - The gender share of women employed in information and technology (IT) occupations is below average ranking anywhere between 7 and 40 percent among computer network engineers to web developers. The average gender share across all occupations is 47% (women) and 53% (men). By U.S. Department of Labor, Women’s Bureau, 2013, *Computer and Information Technology Occupations*



**Figure 2 – Gender Diversity Ranking of Technology Companies by J. Mangalindan, 2014, FORTUNE, “How tech companies compare in employee diversity”**



**Figure 3 – Percentage of women in leadership (top) and technical jobs (bottom) among technology companies by R. Lightner & R. Molla, 2014, WSJ, Diversity in tech**



## IV. Challenges Facing Women at Work (in Tech)

The few women who made it to the top, namely Sheryl Sandberg, COO of Facebook; Marissa Mayer, CEO of Yahoo; Meg Whitman, CEO of Hewlett-Packard, Anne Mulcahy, former CEO and Board of Directors member of Xerox, and Marillyn Hewson, President and CEO of Lockheed Martin, while inspiring, remain outliers. Some attribute the low number of women in science, technology, engineering, and Math (STEM) to the pipeline issue. Whereas, if we can get young girls interested in math and science, the number of women in these industries will increase overtime. However, our review of current research reveals the significance role gender bias plays in driving women out of male-dominated industries. We subsequently examine some of the challenges facing women in tech careers.

### Beyond the Pipeline Problem

Management often points to the lack of gender diversity in tech as supply-side problem. As women's representation has typically lagged behind men in male-dominated fields, few remain in STEM-related industries in comparison to their male counterparts. Only 26 percent of female graduates work in STEM, while 40 percent of male STEM graduates do (U.S. Department of Commerce, Economic and Statistics Administration, 2011). When looking at computer science in particular, the proportion of women has been falling relatively to other STEM fields. According to the National Science Foundation surveys, in 1991, 29 percent of all of all undergraduate degrees in computer science went to women. By 2012, the number had declined to 18 percent (National Science Foundation, 2013). In addition, studies have shown that female MBA graduates are less likely to enter tech-intensive roles. According to Catalyst's research, among 75 percent of MBA female graduates with tech background, only 36 percent returned to tech-intensive industries.

The simple pipeline excuse does not explain the lack of women in non-technical and senior management positions. Female presence tappers off as they move up the corporate ladder. A McKinsey's research notes that while women land 53 percent of all entry-level positions, but quickly fall to 35 percent at director levels, 24 percent among senior vice president position and 19 percent in chief executive level (Barsh & Yee, 2012).

Neither can it explain the rate women are leaving the tech industry. Those who attain managerial positions begin at lower levels, often face significant barriers to career advancement, and are more likely to leave the industry (Catalyst, 2014a). A 2008 study published by the Harvard Business Review observes that over time more than half of the women quit their STEM jobs in the private sector, with the highest attrition rate cited in technology (Hewlett et al., 2008). This is not just a loss to individual women, but significant "brain drain" of female talents to employers, the study notes.

### Silicon Valley's Myth of Meritocracy

Further analysis of the tech industry and its workplace culture reveals a more severe structural issue laden with systemic gender bias. The core problem lies at Silicon Valley's professed meritocracy system in which where the smartest, most skilled, and the best ideas will rise to the top regardless of gender, race, nationality, social class, and educational pedigree. Even though the notion that anyone with the best ideas, who can raise money and start a company, is at the central tenet of Silicon Valley's tech startup ethos, it is far from a pure meritocracy. Reuters' analysis of Silicon Valley's startups that received venture-backed funding from the top five venture capital firms in between 2011 and 2013 found that most of these companies were founded by people who came from "the traditional Silicon Valley cohort," described as:

[The] founders had held a senior position at a big technology firm, worked at a well-connected smaller one, started a successful company already, or attended one of just three universities — Stanford, Harvard and Massachusetts Institute of Technology. (McBride, 2013)

Beyond the “privilege pedigree” that comes with connections, a startup’s potential hinges on the ability of its founder to successfully raise money from investors. A study conducted by Babson College on 6,793 U.S. companies that received venture capital funding between 2011 and 2013 found that while companies with at least one woman on the executive received 21% or \$10.9 billion out of \$50.8 billion, companies with a women CEO only received 3% of total venture capital dollars or \$1.5 billion invested during this period (Brush, Greene, Balanchandra, & Davis, 2014). Do venture capitalists have a gender bias against female entrepreneurs? Ingrained gender stereotypes can influence investing decision in an entrepreneur’s startup. In their study published in the Proceedings of the National Academy of Natural Sciences, Brooks, Huang, Kearney, and Murray (2014), noted that investors preferred pitches presented by male entrepreneurs compared with those given by female entrepreneurs among several pitch competitions in the U.S. The authors observed the moderating effect on the level of persuasiveness linked to the physical attractiveness of male entrepreneurs, whereas the effect was not significant among female entrepreneurs (Brooks et al., 2014).

Researchers have shown that organizations that claim to be meritocratic tend to be more susceptible to gender bias than those that do not. Castilla and Benard (2010) in their article, “The Paradox of Meritocracy in Organizations,” observe that people who work under a reported “fair and unbiased” culture worry less about their actions and how they will be perceived; thus, it gives way more easily to unconscious bias. The results of their experiment revealed that in meritocratic conditions where an organization’s “core values emphasized fairness and compensation based on performance,” a person in managerial position favored a male employee over a female employee who received equivalent reviews by giving him larger bonuses (Castilla & Bernard, 2010).

## **The Inherent Bias in Tech Hiring**

Bias is also inherent in the hiring process that plagues the tech industry. Vivek Wadhwa (2013), a fellow at the Rock Center for Corporate Governance and the author of the 2014 book, “Innovating Women: The Changing Face of Technology,” notes that tech job descriptions are written geared towards male applicants and often include list of skills that aren’t needed or can be acquired on the job. Such requirements often discourage women who don’t think that they are qualified from applying to the position, but that doesn’t turn away men, Wadhwa (2013) commented in his discussion about sexism in tech in the New York Times. Although the federal law effectively bans companies from explicitly soliciting workers of a particular gender, there could be subtle gender bias in way companies word its job listing, particularly among technology and engineering positions (Gaucher, Friesen, & Kay, 2011). The collaborative study between professors at the University of Waterloo and Duke University found that job listings in technology, engineering, and other male-dominated industries used more masculine words, such as “leader,” “competitive” and “dominant,” while job listings for traditional female occupations did not. The authors noted that the presence of masculine-themed words made women less interested in applying even though they might think that they are qualified for it.

## **The Rise of Brogrammer Culture in Tech**

The predominately male culture in tech, dubbed “brogrammer culture,” creates an unwelcoming environment that keeps women from entering the field in the first place (MacMillian, 2012). The notorious misogynic workplace culture that is prevalent among technology startup



companies is responsible for women leaving tech further exacerbating the industry’s gender diversity problem (Miller, 2014). While the “brogrammer” mentality is more pronounced among startup than matured organizations, the legacy of the male dominated culture can make the women feel like outsiders.

## V. Hacking Tech’s Gender Bias

### External vs. Internal Patterns of Bias

In her book, co-authored with Rachel Dempsey, Joan C. Williams, Distinguished Professor of Law at UC Hastings and Director of the Center for WorkLife Law, classifies four general patterns of gender bias that women experience at work, including Prove-it-Again, Tightrope, Maternal Wall, and Tug-of-War. While professional women experience a varied degree of these biases, women of color face a double jeopardy of gender and racial bias (Williams & Dempsey, 2014).

While bias can negatively impact professional women in achieving their career goals and maintaining a work-life balance, internalized assumptions based on the idea of a perfect woman often hold them back from reaching their full potential. Behaviors based on such assumptions often revalidate the existing reward structure and exacerbate the systemic gender bias in the workplace (Detjen, Waters, & Watson, 2013).

Women often internalize bias built on a belief system and a set of assumptions on what makes an idealized woman. In their book, “The Orange Line: A Women’s Guide to Integrating Career, Family, & Life,” Jodi Detjen, Michele Waters and Kelly Watson (2013), introduce the “Feminine Filter” operating on several key assumptions, stated or unconscious, that deeply influence women’s career choices and work and home behavior. The authors argue that as women continue to accept the assumptions, they are less likely to confront gender stereotypes and further conform to the systematic bias currently existing in the American workplace and technology fields in particular (Detjen et al., 2013).

Table 1 gives a summary of four patterns of gender bias recognized by Williams and Dempsey (2014) and six key assumptions of the “Feminine Filter” identified by Detjen et al. (2013).

<b>Four Patterns of Bias (Williams &amp; Dempsey, 2014)</b>	<b>Six Assumptions of The “Feminine Filter” (Detjen et al., 2013)</b>
<b>Prove-it-again:</b> Women are held at a higher standard than men. They often have to prove their competence more than men to be seen as equally capable.	<b>Women need to uphold a perfect image.</b> They tend to avoid risk and overcompensate.  <b>Women assume they are not good enough.</b>
<b>Tightrope:</b> Women often have to find a balance between being perceived as either too feminine to be competent or masculine to be likable.	Because <b>women measure their commitment by how much time they spend on it</b> , they tend to focus quantity over quality.  Assuming <b>tangible and material rewards are not supposed to be important</b> , women tend to lower their career expectation.  Women often <b>believe if they follow the rules, good things will happen</b> ; thus, they tend to accept and not to challenge the status quo.

<b>Maternal Wall:</b> Working mothers are often questioned about their job commitments, while such prescriptive bias views them more as mothers than professional working women.	<b>Women are primarily the caregiver</b> and responsible for home and family and taking care of everyone. They tend to sacrifice their career ambitions and personal goals to meet the needs of others.
<b>Tug-of-War:</b> Gender bias can fuel conflict between women of different generations with opposing coping strategies.	Women often <b>believe if they follow the rules, good things will happen</b> ; thus, they tend to accept and not to challenge the status quo.

Table 1 – Patterns of gender bias and internal assumptions held by professional women

**Eliminating Bias (Internally and Externally)**

**Removing the Feminine Filter**

Women have a difficult time recognizing these negative assumptions leading to behavior that undermine their value and contribution (Detjen et al., 2013). One strategy that women can use to break the conformity of a one-dimensional life is to integrate their personal, social, and professional lives. Detjen et al. believes that women can replace career-limiting bad habits by reframing the traditionally held assumptions and developing what the authors called, “The Orange Line Skills.” Below are the six skills for women living a more balanced life.

1. Recognize when the Feminine Filter is at work
2. Bring yourself into the equation
3. Develop self-awareness
4. Build a support system
5. Get comfortable operating in imperfection
6. Expand your universe

**The Role of the Institution**

Sheryl Sandberg kick-started a new wave of discussion around women and gender equality with her book Lean In (2013). The COO of Facebook encourages women not to “leave before [they] leave work, sit at the table and raise their voices.” However, this “Lean in” approach is less effective when facing current gender bias inherent in current organization and workplace structure. When Anne-Marie Slaughter (2012), a Princeton professor and a former public policy adviser for Hillary Clinton, wrote her cover story in the Atlantic, titled “Women Still can’t have it all”, she did not anticipate the viral response that would follow. What Anne-Marie Slaughter (2012) brought to the debate was that “having it all” is not just simply about personal determination,” but oftentimes a product of factors stemming from the cultural and institutional biases in our society. Mrs. Slaughter calls for a closer look at these structural and systemic issues in depth in her new book, Unfinished Business (2015).

What options exist for organizations? Current research suggests there are many opportunities to change the structure to reduce inherent bias.

**Implementing “Bias interrupters” among hiring, job assignments, performance evaluations, and compensation changes:** Identify key metrics in each of these processes and apply a “bias

interrupter” which measures the result. (Williams, 2014). Many leaders require a minimum number of women on every hiring and promotion list. In addition, making the criteria for these positions more objective (i.e. evaluating each candidate more objectively) makes decision making more transparent.

**Changing the “Face Time” Culture:** According to a study by the Center for American Progress, the percent of women and men working more than 50 hours a week has increased since the late 1970s (Williams & Boushey, 2010). While men without children put in the most overtime, women without children work the most unpaid overtime. A British study found that nearly one in four women reported unpaid overtime (BBC, 2008). The deeply ingrained belief that the more hours spent in the office correlate with an individual’s productivity and commitment is a “rational myth,” according to organizational sociologists (Albison & Correll, 2013). More face time doesn’t necessarily equal more value added. Company cultures that value face time often do so at the cost of their talented workers, especially women juggling between work and family responsibility. Changing the baseline expectation of “when, where, and how” the work is done can make a significant difference in how employees act (Williams, 2012). This is probably one of the most challenging aspects as there is often a culture within organizations that lionizes the heroic work effort required. Shifting evaluation to an outcomes focus v. face time requires rethinking what is measured.

**Making Family-Friendly Policies the Norm:** Policies can reflect the organization’s value in viewing employees as caregivers as equal as those who don’t have the same responsibilities. Doing away with such biases can help companies to come up with different metrics in evaluation and viewing one’s performance at work. By adopting maternal/paternal leaves and flexible work schedule, companies can move toward goals in retaining employees (Leonhardt, 2014) . However, by making such policies the default can remove the negative stigma on employees who take advantage of these policies. Paternity leave is now considered a key lever for change because of two factors: 1) it engages men in parenting from the start giving them confidence and helping to equalize the work effort of a new baby and 2) it role models that men require these policies as well, thus normalizing them. (Economist, 2015).

**Leading from the Top:** Acknowledging biases isn’t enough. Management needs to take it a step further to show their disapproval of biases (Grant & Sandberg, 2014). Having role women model in every rank of the organization is important for women across companies to in taking their steps in their career advancement. This includes sponsorship and role modeling senior women.

### **Broadening the Discussion by Enlisting Men**

Men are increasingly becoming caregivers too and younger men are asking about family-work balance (Livingston, 2014). Engaging men in the discussion of gender equality taking the step toward breaking down gender stereotypes and changing the attitude, enabling the removal of the negative stigma associated with family responsibilities.

Overall, while gender bias in technology appears endemic and entrenched, there is hope. Both women and organizations can shift their perspectives, policies, and processes to reduce inherent bias and more effectively leverage latent talent. Silicon Valley cannot consider itself a meritocracy when they exclude such a large percentage of the workforce. Technology firms have an opportunity to build on their flexibility, agility and openness to fundamentally change the workplace for everyone and lead in yet another arena.

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