

# Women in Technology International (WITI)

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## Business Impact by Women in Science and Technology

### A WITI Research Paper

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Women-owned firms will make approximately \$50 million in computer-related purchases this year.

39% of business influencers, defined as those who are involved in the purchase of computers and related products for their organizations, are women. This is a universe of 9.2 million female business influencers.

Women-owned businesses now employ 35% more people in the U.S. than the *Fortune* 500 companies employ worldwide.

Women-owned businesses number 7.7 million, provide jobs for 15.5 million people and generate nearly \$1.4 trillion in sales.

Ten years ago, women made up only 10% of online users. Today it has grown to 43%.

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“It’s no longer a question, it’s a fact — women have major impact as both influencers and purchasers of technology. Those companies committed to hiring women at every level of the organization today will have a significant competitive advantage in the 21<sup>st</sup> century!”

— *Carolyn Leighton, executive director, Women in Technology International (WITI)*

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All contributors except those requesting anonymity are listed in the “Acknowledgments” section at the end of this paper.

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## Overview

### Abstract

The “glass ceiling” is a concept that betrays America’s most basic principles of “fair play.” It is the unseen, yet unbreakable barrier that keeps women and minorities from rising to the top levels of the organizational ladder, regardless of their qualifications or achievements.

The Federal Glass Ceiling Commission was established in 1991 to study this barrier and make recommendations for eliminating hindrances to the advancement of women and minorities to management and decisionmaking positions. The recommendations were published in November 1995 under the title “A Solid Investment: Making Full Use of the Nation’s Human Capital.” Women in Technology International (WITI) was formally named a resource by the Glass Ceiling Commission.

WITI strongly endorses the recommendations of the Commission — WITI is also dedicated to breaking barriers. Founded in 1989, its organizational objectives are:

- Increasing the number of women in key technical and management roles
- Helping women become more financially independent and technology-literate
- Encouraging young women to choose careers in science and technology

WITI is a rapidly growing association of more than 6,000 members, 95 percent of whom are professional women working in science or technology organizations. WITI has pioneered a new paradigm for professional associations — operating in a proactive business mode and working closely with industry leaders, WITI:

- Helps women develop technical and workplace competencies
- Brings women to the attention of organizations looking for strong talent
- Highlights the positive business impact women have on science and technology

Why do organizations work to break glass ceiling barriers? “Fair play” may also play a role, but the Commission cited economic imperative — the bottom line — as the most likely motivator.

Given the fact that women are the fastest growing purchasers and influencers of technology, WITI believes it makes excellent business sense to involve women in every aspect of the development of technologies and products. 1997 business pressures like changing consumer demographics, global competition, and an extreme shortage of highly-skilled professionals make organizations especially receptive to a discussion of the positive impact women can have on their bottom line.

This paper was written to provide that discussion and to open the door for additional investigation. It is WITI’s hope that the dialog begun in these pages will help talented women and organizations looking for talent to find or recommit to one another — and the result will be a more level playing field and bottom-line benefit for both.

## **Organization and Contents**

This research paper is organized as follows:

### **Overview (Abstract) (page 3)**

The abstract outlines the motivation behind this paper and the positive business impact this investigation can have on science and technology organizations and the women who work for them.

### **Findings and Recommendations (page 7)**

WITI intends this to be the beginning of an ongoing dialog that will increase and continue to promote women's value to science and technology organizations. A summary of the findings and recommendations for further action are contained in this section.

The findings and recommendations are categorized as follows:

- **Men and Women Have Differing Views of What it Takes to Make a Successful Senior Manager**
- **Women in Mid-Career Report Significant Glass Ceiling Barriers**
- **“The Old Boys’ Club” and “Stolen Ideas” Are Prevalent Workplace Frustrations for Women (Especially through Mid-Career)**
- **Getting Consensus on Diversity Metrics is a Difficult Proposition**
- **Quantification and Wider Promotion of Employees’ “Business Value” Can Benefit both Science and Technology Organizations and the People Who Work for Them**

The Annotated Bibliography (starting on page 61) contains additional findings — may of them complementary to and supportive of those listed above.

### **Research Results (page 13)**

This section contains the results of a survey and poll on men's and women's views on what it takes to be a successful senior manager or a successful science or technology professional.

The telephone survey, which was jointly sponsored by WITI and Ziff-Davis, was conducted in April/May 1997.

The poll, conducted on the WITI website ([www.witi.com](http://www.witi.com)) took place in May 1997.

Survey questions are contained in Appendix A and poll questions in Appendix B.

### **Summary of Interviews and Focus-group Discussions (page 22)**

In March and April 1997 e-mail and in-person interviews were conducted with women at all levels of science and technology organizations. This section contains a summary of those interviews:

- Summary of the e-mail interviews conducted in March and April 1997
- Summary of the discussion at the WITI Silicon Valley regional meeting on March 18, 1997
- Interview with Barbara Beck, vice president of Human Resources, Cisco Systems
- Interview with Nora Denzel, senior vice president of product operations, Legato Systems
- Interview with Pamela Meyer Lopker, founder and president, QAD
- “The Women of Autodesk”
  - Information about Carol Bartz, CEO, Autodesk
  - Focus group conducted at Autodesk in April 1997
- E-mail interview with WITI advisory board members
  - Debbie Arnold, vice president, Relationship Initiatives, Visa International
  - Peggy O’Connor, MCI branch manager
  - Tama Olver, vice president, Corporate Information Resources, Amdahl Corporation

Interview questions are located in Appendix C.

### **Profiles of 1997 Hall of Fame Honorees (page 52)**

WITI-sponsored Women in Science and Technology Month, held in June of each year, was launched to increase public awareness of the contributions of women in science and technology. Outstanding women are profiled on the WITI website ([www.witi.com](http://www.witi.com)) throughout the month.

A Hall of Fame competition is part of the Women in Science and Technology celebration. Winners are honored at a banquet at the WITI annual conference, also held in June.

This section of the paper contains information about the 1997 Hall of Fame honorees:

- The first programmers in the world – six “computers” selected in 1945 by the U.S. Army to program the ENIAC computer: Kay Mauchley Antonelli, Jean Bartik, Betty Holberton, Marlyn Meltzer, Frances Spence, and Ruth Teitelbaum
- Fran Allen, IBM fellow and senior technical consultant to vice president of Services, Applications, and Solutions, IBM Corporation
- Carol Bartz, CEO, Autodesk
- Pamela Lopker, founder and president, QAD Inc.
- Marcia Neugebauer, visiting distinguished scientist, Jet Propulsion Laboratory

- Donna Shirley, manager of the Mars Exploration Program, Jet Propulsion Laboratory
- Shaunna Sowell, vice president and manager of Corporate Environmental, Texas Instruments
- Patty Stonesifer, management advisor to DreamWorks and formerly senior vice president of Microsoft Corporation
- Patricia Wallington, corporate vice president and chief information officer, The Document Company Xerox
- Rosalyn Yalow, Nobel laureate, Veterans Affairs Medical Center

### **Annotated Bibliography (Related Studies and Statistics) (page 61)**

This section contains short summaries of research projects conducted during the past several years that are related to the topic of this paper:

- Salary Surveys
- Additional Research on Workplace Barriers
- Independent Women’s Forum Challenges Stereotypes about Workplace Discrimination
- Research on Value and the Recognition of Value
- *The Equity Equation: Fostering the Advancement of Women in the Sciences, Mathematics, and Engineering*, edited by Cinda-Sue Davis, et al
- Research on Women Executives and Board Members
- Research on Women’s and Men’s Management Styles
- Research on Women Business Owners and Women as Purchasers of Technology
- *Who Succeeds in Science? The Gender Dimension* by Gerhard Sonnert

### **Acknowledgments (page 88)**

This section lists organizations and individuals who participated in the paper (and were willing to be identified), are cited or quoted, or provided sponsorship.

### **Appendix A: Survey Questions (page 93)**

### **Appendix B: Poll Questions (page 96)**

### **Appendix C: Interview Questions (page 98)**

## Objectives, Findings, and Recommendations

### Objectives

Objectives of this research paper are as follows:

- Highlight the positive business impact women are making in science and technology.
- Investigate “glass ceiling” barriers and other obstacles that seem to be negatively affecting women’s career progress in science and technology. Include both obstacles that seem to be self-imposed and those that seem to be related to barriers within organizations.

Specifically:

- Investigate the views of men and women at various levels of science and technology organizations on what constitutes “business value” and how to define “business success.”
- Gather anecdotal data about commonly-perceived barriers to professional success.
- Make recommendations about how women in science and technology organizations can increase and better promote their value.
- Make recommendations on how science and technology organizations can become more “gender-neutral” and “woman-friendly” — and in so doing increase their organizational strength and bottom-line profitability.

### Additional Background Information

The women and men who were interviewed, surveyed, and polled for this paper represent a random sample, and the findings described in this section deal only with observations that seem to show significant trends and directions and are worthy of note and of further study.

Participants range from a few just beginning their careers to many senior-level technologists and executives.

### Findings and Recommendations

#### **Men and Women Have Differing Views of What it Takes to Make a Successful Senior Manager**

While not providing definitive proof, the survey conducted in April/May 1997 (sponsored jointly by WITI and Ziff-Davis) points to the fact that men and women have differing views of what it takes to make a successful senior manager. **Men in senior management are looking for communications skills and integrity when hiring others at this level. In contrast, women look for team building skills in addition to integrity.**

Similarly, there are differences in what men and women identify as barriers to success for senior management. Men look at the inability to meet business objectives, while women focus on indecisiveness.

These differences may help to explain why women have trouble going beyond certain levels in business.

The data also point to a relationship between women in senior management positions and the bottom line. Women in senior management indicate that senior management women make a greater contribution to the bottom lines of their companies than men, whereas men in senior management indicate the reverse.

### **Women in Mid-career Report Significant Glass Ceiling Barriers**

#### Observations

**The “glass ceiling” at the mid-level may not be reported on as often as the one at the top — but it may be depriving organizations of top talent to meet their business challenges in the year 2002 and beyond.**

Women just starting in their careers and people who have “made it to the top” expressed the most general satisfaction with their careers.

Women “in the middle” tended to express the most frustration. Some said they would like to stay with their present employer but felt they would soon opt to change jobs so they could continue to make professional progress.

Although women at all levels told “war stories” like the ones described in the following sections, the women at the top talked about them as “something I went through and learned from,” and the women in the middle talked about them more as “an ongoing battle I engage in every day.”

Of course, many of the ones in the middle will make it through the battle and emerge victorious.

On the other hand, a change in workplace climate or some meaningful coaching at a difficult career juncture may allow even more women to succeed and contribute additional value to their organizations.

#### Recommendations

**Are employers aware of the high level of frustration among this group of women? If not, they should take steps to find out how their female employees feel.**

Many of these women are talented “thirty-somethings,” some of whom will become “high flyers” in *somebody’s* science and technology organization in the year 2002.

It would seem that many women at this level could benefit a great deal from mentoring, communication coaching, and leadership training. They have already proven themselves to be very capable, have a strong motivation to succeed, and recognize the need for a variety of styles in their behavioral arsenal.



In addition, employers should take a hard look at the kind of workplace climate they are providing. Is it turning off some of their most valuable employees?

### **“The Old Boys’ Club” and “Stolen Ideas” Are Prevalent Workplace Frustrations for Women (Especially through Mid-Career)**

#### Observations

- **Many women believe that science and technology organizations operate like “old-boys’ clubs.”**

Many women in the focus groups and e-mail interviews told stories of how decisions had been made about matters that were ostensibly their responsibility — in meetings called without their knowledge, in hallway conversations, on the golf course, or on the tennis court. Additional stories told of being left off the invitation list of key meetings and brainstorming sessions.

Some reported protesting and being told, “We didn’t think you’d be interested.”

- **Having their ideas stolen by others is a very common — and enraging — professional experience among women.**

The following story was related numerous times:

“We were in a meeting brainstorming the solution to a problem, and I came up with what I thought was a good idea. Nobody picked up on it, and we kept talking. About 10 minutes later [a man in the group] expressed the same idea, and [the leader of the group] picked up on it right away and praised him for his great idea!”

The more timid (or perhaps the more politically cautious) women experiencing this situation reported sitting there fuming but saying nothing. The more outspoken reported remarking something like, “Yes, that’s a great idea! It’s what I said 10 minutes ago!”

A case in point (and perhaps proof that “what goes around, comes around”) is the six women who programmed the ENIAC computer in 1946 — at first mechanically reprogramming it for each calculation (by reshuffling cables, restacking bus trays, and resetting the operation switches on each component), and then writing the programming instructions that converted it into a stored program computer.

Their accomplishment was nothing short of groundbreaking, but they have been, up until now, portrayed in computer histories as “assistants” of the hardware designers — or simply, “the girls.”

The credit was all taken by “the boys,” and history is just now being rewritten to recognize the significance of these women’s contribution to computing.

- **Many women found the cultural climate in their workplace so intolerable that they left the organization.**

Several had left more than one company under those circumstances. A number left and started their own companies.

## Recommendations

- **Organizations should provide a work environment that is both “gender neutral” and “woman friendly.” And, to help them do that, they should invest in an accurate thermometer to measure levels of frustration.**

It is not surprising that women expressed their business frustrations: The interview questions invited them to do so. Men might well express some of the same frustrations, if asked.

However, what is significant is the fact that the very same stories were told over and over. Also significant is the deeply-felt emotions — perhaps partly because things aren't changing “fast enough.” The frustration captured in the interview comments on the following pages is unmistakable. Even when a number of years had passed since a particular incident occurred, there is often fire and bitterness in the retelling.

Obviously people have a difficult time doing their professional best in an environment that seems to them to be hostile and uncaring.

Many women reported that “complaining doesn't help.” In one case an immediate manager told the woman who reported a problem, “If there's a disagreement between you and one of the men, you lose!” In other cases, women lodged complaints with “channels” and felt that the “resolution” humiliated them at the expense of making their management chain and the HR organization look good.

**It would seem that many organizations who desperately need high-caliber employees to stay afloat in today's competitive marketplace may not be aware of these cultural and communication problems in their workplace environment. Dozens of women reported putting up with these kinds of problems until they had “had it up to here” and then quitting to join another company or found their own.**

**Do companies believe they can throw cold water before the “boiling point” is reached? Or aren't they even aware that the burner is on? Obviously from the stories related in this paper, many companies are losing talent by having inaccurate thermometers or not using them judiciously.**

- **Many women could benefit from a support structure devoted to “learning the ropes.”**

Many respondents expressed a strong desire for more networking and mentoring opportunities than they were now getting. Some mentioned the strong tendency for women to spend too much time preaching to one another and not enough time helping peers and subordinates get through real, day-to-day problems.

One e-mail respondent expressed it well, when asked how she would advise a daughter or younger colleague:

“I wouldn't “advise” her about any of this. I would *show* her how to do it; I would train her thoroughly in doing it until it became second nature to her.”

Many respondents reported having participated in effective leadership training and mentoring. However, it would seem training sessions are often looked on as a “quick fix” when what is needed is ongoing training and support.

Networking or mentoring focus areas mentioned most often were:

- **Communication:** Many women would like to learn to express their ideas more clearly, and how to tailor their behavioral approach to a specific audience.
- **Mentoring, coaching:** Many women would like to be part of a formal or informal mentoring program that would allow them to talk through problems and get expert and dispassionate advice on how to solve them. Many respondents expressed this thought: “I would welcome coaching; I know I need it.” Many expressed the idea that formal mentoring within a person’s own management chain doesn’t work well. Some also expressed the idea that a poor mentor is worse than no mentor at all. Most successful programs described by respondents all shared the characteristic of being tailored to the specific need of an individual or team.
- **Leadership/diversity training:** Many respondents were interested in group training that allows practice and feedback in a somewhat neutral situation, and teaches both women and men how to listen and respond to one another in a more effective way. Several expressed the desire not to perpetuate the kinds of problems they had experienced by creating an “old girls’ club” — but rather providing opportunities where all employees could learn and benefit.

### **Getting Consensus on Diversity Metrics is a Difficult Proposition**

#### Observations

One of the questions asked in the e-mail survey was, “Name three metrics that organizations could use to measure their success in recognizing the value women contribute to their business.”

There was no real pattern in the answers given, although they focused on two areas:

- **Numbers, percentages:** For example, number of women on the board, number of women in executive (VP and above) positions, percent of managers who are women
- **Satisfaction levels:** For example, based on a satisfaction survey, how happy are women working in the organization (perhaps compared to men)

**As many HR organizations are painfully aware, creating cultural objectives based on metrics is fraught with peril, especially in today’s post-affirmative action world.**

#### Recommendations

**A research study comparing some of the more obvious metrics (number or percentage of women at the VP level and above) with the overall satisfaction level of women in the organization (at all levels) might produce interesting results.**

## **Quantification and Wider Promotion of Employees' "Business Value" Can Benefit both Science and Technology Organizations and the People Who Work for Them**

### Observations

- **Women at the higher levels (top technologists, entrepreneurs, managers at vice president and above) tended to express their own value in bottom-line terms.**

When asked, "What is your value to your organization?" women at the higher levels talked about key projects completed, revenue generated, and money saved.

- **Women at the lower levels tended to express their own value in vaguer terms**

When asked, "What is your value to your organization?" women at the lower levels tended to talk about job title, job responsibilities, and the nature of a current work project.

### Recommendations

- In recent years many companies have begun tying raises and bonuses to quarterly or yearly financial results. **It would seem that learning to express their own business value in bottom-line terms would give individual women a strong professional plus.**
- **Organizations should also make it clear what is valued (specific accomplishments as well as workplace behavior) and what objective criteria are used to determine raises and grant promotions.**
- The media should increase the number of women who are quoted or showcased for their expertise.
- The media should place more emphasis on the expertise and business savvy of women, rather than emphasizing stereotypes by focusing only on stories about balancing career and family.
- CEOs need to take a hard look at the bottom-line benefits of bringing women into every level of their organizations.
- Women need to continuously communicate and push for recognition of their bottom-line value.

## Research Results

### Survey Jointly Sponsored by WITI and Ziff-Davis

#### Methodology

This survey was conducted as part of the ICR omnibus study, a weekly telephone survey conducted among a random sample of 1000 adults. The data are projectable to the U.S. adult population age 18 or older.

Interviewing took place between April 30 and May 4, 1997.

It is important to note that the sample of female senior managers (34) is small and the data for this group should be used with caution. Rather than cite precise percentages for this group, it is suggested that approximations such as “over eight in ten,” “about a third,” or “the majority” be used when describing this group. For purposes of this summary, exact percentages have been used.

#### Conclusions

**While not providing definitive proof, this study certainly points to the fact that men and women have differing views of what it takes to make a successful senior manager.** Men in senior management are looking for communications skills and integrity when hiring others at this level. In contrast, women look for team building skills in addition to integrity.

Similarly, there are differences in what men and women identify as barriers to success for senior management. Men look at the inability to meet business objectives while women focus on indecisiveness.

**These differences may help to explain why women have trouble going beyond certain levels in business.**

These data also point to a relationship between women in senior management positions and the bottom line. Women in senior management indicate that senior management women make a greater contribution to the bottom lines of their companies than men, whereas men in senior management indicate the reverse.

#### Summary

- Among employed adults, 17% classify themselves as senior management (defined by a list of titles including owner/partner, president, vice president, top management, chairman of the board, director, member of the board, CEO/COO/CIO/CFO, and treasurer).

Senior management is more prevalent among males (22%) than among females (11%).

See Table 1 and Table 2.

	Total	Males	Females
Base: Total Respondents	(1012)	(509)	(503)
Employed (Net)	64%	73%	56%
Full-time	51	63	39
Part-time	13	10	17
Not Employed	36	27	44

• Table 1: Employment. Q. 2-4 Currently, are you yourself employed full-time, part-time, or not at all?

	Total	Males	Females
Base: Total Respondents	(683)	(396)	(287)
Senior Management (Net)	17%	22%	11%
Owner/Partner	7	9	6
Director	4	5	2
Top Management	3	3	2
President	1	2	1
Member of the Board	1	1	1
Vice President (EVP, Sr VP, Asst VP)	1	1	1
COO	1	*	1
Treasurer	1	*	1
CFO	1	1	1
CEO	*	1	*
CIO	*	*	-
Chairman of the Board	*	*	-
Other/None of These	83	78	89

• Table 2: Current Job Title. Q.WI-1 Which of the following, if any, describes your current job title?  
(\* Less than 0.5%)

- The majority of senior managers (62%) indicate that the highest ranking woman in their company has a title that classifies her as senior management.

Female senior managers are much more likely than their male counterparts to indicate that the highest ranking woman in their organizations is a senior manager (88% vs. 50%).

See Table 3.

	Total	Males	Females
Base: Senior Management	(133)	(99)	(34)**
Senior Management (Net)	62%	50%	88%
Owner/Partner	23	15	40
President	11	8	18
Vice President (Exec VP, Sr VP, Asst VP)	8	11	2
Top Management	6	5	7
Chairman of the Board	6	6	5
Director	4	1	11
Member of the Board	3	4	-
CEO	3	1	7
Treasurer	2	-	8
CFO	1	1	2
COO	*	-	2

	Total	Males	Females
Something Else	31	42	5
Don't Know	7	6	8
Refused	1	1	-

Table 3: Title of Highest Ranking Woman in Company. Q.WI-2 What is the title of the highest level woman in your organization? (Percentages may not equal 100% due to rounding. \*\* Small base size, use with caution.)

- Senior managers were asked to rate the importance of various characteristics in hiring senior management. Overall, integrity was considered to be the most important characteristic among those listed followed by communication skills and team building skills.

Some differences based on gender emerge. Males rate communications skills as being more important while females look for team building skills and decisiveness.

See Table 4.

	Total	Males	Females
Base: Senior Management	(133)	(99)	(34)**
Characteristics:			
Integrity	78%	78%	78%
Communication Skills	69	75	56
Team Building Skills	61	55	74
Vision	54	52	57
Decisiveness	47	42	58
Creativity	47	42	58
Analytical Ability	32	30	39
Proven Track Record of Business Results	29	29	28

Table 4: Importance of Characteristics in Hiring Senior Management (Top Box Rating - Extremely Important). Q.WI-3 I'm going to read you a list of characteristics that you might look for when you are hiring a person in senior management. Using a scale of 1 to 4, where "1" means "Not important at all" and "4" means "Extremely important", please tell me how important each of these characteristics is to you when you hire a person, either a man or a woman, in senior management. You may use any number from 1 to 4. How important is . . . ? (\*\* Small base size, use with caution.)

- Overall, poor communication skills and inability to meet business objectives are rated as the barriers which have the most impact on a senior manager's job. Also rated as having impact are indecisiveness and unfocused thinking.

Again, differences between males and females are evident. Males find inability to meet business goals a more significant barrier, while females regard indecisiveness and unfocused thinking as greater barriers to a senior manager doing his or her job well.

See Table 5.

	Total	Males	Females
Base: Senior Management	(133)	(99)	(34)**
Barriers:			
Poor Communication Skills	72%	71%	76%
Inability To Meet Business Objectives	60	65	48
Indecisiveness	58	55	64

	Total	Males	Females
Unfocused Thinking	57	54	63
Inability To Lead	50	52	43
Lack of Creativity	40	41	38
Lack of Strategic Vision	36	32	45
Emotionalism	33	31	38

Table 5: Barriers for Senior Management (Top Box Rating - Significant Impact). Q.WI-4 I am going to read you a list of barriers which can prevent a person in senior management from doing his or her job well. Using a scale of 1 to 4, where “1” means “No Impact at All” and “4” means “Significant Impact”, please tell me how much of an impact each of these barriers has on a person’s career. Remember, you may use any number from 1 to 4. How much of an impact does . . ? (\*\* Small base size, use with caution)

- Senior managers think that either men and women contribute equally to the bottom line of their companies (53%) or that men contribute more (36%).

Males follow this same pattern, with only 2% indicating that women contribute more to the bottom lines of their companies. In contrast, 29% of female senior managers indicate that women contribute more to the bottom lines of their companies.

See Table 6.

	Total	Males	Females
Base: Senior Management	(133)	(99)	(34)**
Men	36%	47%	11%
Women	10	2	29
Both Contribute Equally	53	50	60
Don't Know	1	1	-

Table 6: Contribution to Bottom Line. Q.WI-5 Thinking only about the senior management of your company, who contributes more to the bottom line of your company or organization, men, women, or do they both contribute equally? (\*\* Small base size, use with caution)



## **WITI Website Poll**

### **Methodology**

This poll measured:

- Respondents' attitudes on the importance of the same 16 characteristics (8 positive skills and 8 barriers to success) as the joint WITI/Ziff-Davis survey described above

However, the characteristics were described in this poll as being "important to (or barriers to) professional success [in general]" as opposed to "important to (or barriers to) success in senior management."

- Respondents' attitudes on the strength of weakness of women and men relative to the positive skills and barriers to success

The poll was conducted on the WITI website ([www.witi.com](http://www.witi.com)) during the 10 days between May 9 and May 19, 1997. Total number of respondents: 134.

Both women and men responded to the poll. There was no way to compare women's and men's answers, although the majority of respondents were women (83 percent). Seventy-nine percent of the respondents work in science or technology organizations.

### **Conclusions**

It is not possible to draw definitive conclusions from these results, although they do point to the possibility that a follow-on study comparing men's and women's answers is worthy of consideration.

The survey results (discussed in the prior section) showed that male senior managers look for communications skills and integrity when hiring others at the same level. Women look for team building skills in addition to integrity.

Poll respondents (again, who were 83 percent women) also rated communication skills as very important (83 percent "important" or "very important"). They also rated women highest in possessing this skill (62 percent said women are higher as a group, 7 percent said men are higher as a group, and 29 percent said women and men are equal).

In the survey male senior managers indicated that men in their organizations make a greater contribution to the bottom line, and (as just mentioned) they believe communication is very important in professional success. The addition of the poll results then raises this question (among others): When women and men talk about "ability to communicate," are they really talking about the same thing?

In the survey, there were differences in what men and women identified as barriers to success for senior management. Men looked at the inability to meet business objectives while women focused on indecisiveness.

In the poll, respondents also rated inability to meet business objectives as a key barrier to professional success. They rated women and men equally prone to this problem (83 percent equal).

Poll respondents rated indecisiveness as an important barrier, and they rated women as more prone to the problem than men (41 percent for women and 15 percent for men). (On the positive side, they also rated men higher in decisiveness.)

Additional poll conclusions worthy of note:

- Respondents rated emotionalism as the least important barrier to professional success. They rated women weakest in this area (63 percent said women were more prone to this problem).
- There was a marked contrast in the poll between results for the positive skill “proven track record” and the negative equivalent (or perhaps the respondents didn’t think it was equivalent) “inability to meet business objectives.” “Proven track record” was the least important of the positive skills, and it got the lowest rating for women. “Inability to meet business objectives” was one of the most important barriers, and the highest “equality” rating.

**Findings**

Table 7 shows poll results for factors in professional success. The complete poll is in Appendix B.

	Importance (percent “very important” or “important”)	Women	Men	Equal
Analytical ability	91%	18%	17%	63%
Decisiveness	81	16	41	41
Creativity	82	48	9	42
Vision	79	25	24	49
Integrity	85	50	6	43
Team building skills	82	52	13	33
Proven track record	67	5	44	49
Communication skills	83	62	7	29

• Table 7: Factors in professional success

Table 8 shows poll results for the barriers to professional success. The complete poll is in Appendix B.


	Importance (percent “very important” or “important”)	Women	Men	Equal
Unfocused thinking	81%	21%	12%	65%
Indecisiveness	81	41	15	42
Lack of creativity	62	7	44	47
Lack of strategic vision	70	24	15	60
Lack of communication skills	87	10	62	26
Emotionalism	48	63	2	34
Inability to lead	56	20	8	70
Inability to meet business objectives	84	10	5	83

• Table 8: Barriers to professional success

Representative comments:

- Emotionalism is something I have found is not tolerated in a male-dominated work environment.
- Many of the men I work with initially feel uncomfortable communicating and working with me primarily because I believe they feel threatened by me and would be embarrassed if I “showed them up” or pointed out a design error or better design solution.
- I have had to deal with a lack of integrity in one of my co-workers. He has given me information which is wrong and will admit to it only if caught.
- I have found it difficult to get a leadership position, not because I am not capable, but because there are many men who simply do not want to be led by a woman.
- If a man gets angry, people don’t think he’s being emotional. However, if a woman gets angry, they think she’s being emotional.
- I was formerly in a technical area where creativity and efforts at team-building were viewed as indecisiveness and inability to lead. I was the only female employed in a group of 8-12 men. I quit that job and went to another job at a company with more women in general and [also] in leadership positions. My creativity has been praised and rewarded, and I think we produce impressive products. I am so fulfilled [in my new job] that I don’t mind the 12-hour days and all-nighters!

- I was blessed with a mother who had vision, courage, conviction, creativity, follow through, communication skills, and strength — and who accepted no less from her daughters.
- When I asked for support from the rest of the executive team to find new business and didn't get it, I started looking for a new job. Now the boss (male) is asking for new business ideas . . . well, it's too late to get mine. I'm going to a company that appreciates my vision.
- Though I think men on a whole are better at looking at the whole picture (vision), this has [also] been one of my strong points. More than once I have come up with the idea and even implemented the plan and all the credit went to a man. I find that I am not good at speaking up and taking credit for my ideas and though I have worked hard on improving this, I don't seem to be making much progress.
- I worked for years in industry and consulting. Now I am in academia, and find that female deans, department heads, university presidents, etc. are in general much more effective and much easier to deal with than those who are male.
- Inability to meet business objectives due to lack of assertiveness caused me to be downsized. At my new job, I am much more assertive.
- Many times a boss's or team leader's inability to lead, emotionalism, poor communication, or lack of strategic vision has led to a project not succeeding, people quitting or being fired, general unpleasantness, etc. I've seen it over and over again, and women and men are equally guilty.
- A woman with a product or business vision is "dominating" and "not a team player"; a man with the same characteristics is a "visionary" and an "individual thinker." A woman who shows leadership and decisiveness is a threat; a man who does the same is a born leader. Men and women aren't really different in these characteristics, but the way they are perceived and treated is completely different.
- Studies that have been done on orchestras hiring musicians are fascinating. With the addition of blind auditions all of a sudden women can play the violin!
- The inability of some technical people to verbalize and communicate ideas has driven me to madness. One [colleague] has no people skills and cannot understand why attacking people is not an optimal path to teambuilding. (He's being protected by the CEO.)
- Strong women are still feared and held back in business.
- What kind of nonsense is this?! I believe that men and women possess the above traits as individuals, not groups. I hope the people I work with (and for) feel the same, and judge me on my own merits and actions.
- I have chosen not to respond to this survey because I think it is time that we stopped all this comparison business between men and women. This type of activity only fuels negative competition and discourages men and women in cooperating.
- I did not answer the gender comparison questions, and in fact, I am disappointed they are here. As a woman working in high tech I want my merits and qualifications evaluated on a par with others, and prefer that my gender not be considered.

- There are two things that would indicate to me that it is time to celebrate the differences between genders. First, when the upper management and board of the high tech firm I work for is comprised of 50% women and is racially and ethnically diverse. Second, when I have attended **one** women's fundraiser or feminist group meeting and **not** heard the statement "I am math impaired" in the first 20 minutes.
  - I did not answer the "who is more" questions because I feel they are ambiguous and do nothing but contribute to stereotypes existing today.
  - I have chosen not to respond to this survey because I think it is time we stopped all this comparison business between men and women.
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# Interviews

## E-mail Interviews

### General Questions

- Total number of respondents: 72
- Willing to be identified by name: 45, not willing to be identified: 27
- Employees: 55, entrepreneurs: 16, declined to state: 1
- Among the employees, profit: 45, non-profit: 9, declined to state: 1
- Among the employees, large: 39, medium: 9, small: 7, declined to state: 1
- Managers: 32, individual contributors: 32, both: 7, declined to state: 1
- Technologists: 37, non-technologists: 28 (managers usually identified themselves as non-technologists), both: 3, declined to state: 3

### “Value” Questions

The questions asked in the e-mail interview are listed in Appendix B.

Below are listed a subset of the questions with a cross-section of responses.

- **[V3] How have you contributed value to your current organization? or [V6] What is your proudest career accomplishment?**
  - The sales revenue of my area has grown 40 percent per year and should reach \$40 million in sales during 1998.
  - I'm one of the co-founders, so a big piece of my contribution has been getting the company off the ground.
  - I brought in \$.5 million of business from a single customer who had us “black listed” for five years.
  - Through negotiations, I have been responsible for saving the company over \$30 million in the past five years.
  - Building a \$1 million company. Authoring or co-authoring 31 books on software.
  - The turnaround of a failing software company. I was promoted to vice president in a Fortune 50 firm as a result.
  - My department generates nearly \$8 million in revenue annually. Through process improvements, we have been able to lower department expenses by over 10% in the last three years.

- My proudest career accomplishment was saving my company over a million dollars.
- The number one value I have brought to the organization is branding — of our product, our company, and our product category within the industry.
- As a consultant I contribute value to my customers through training and consultations in gender, diversity, supporting women’s programs, and women’s leadership and team building.
- Becoming a project chief on the Apollo Program’s Lunar Surface Geologic Experiment at the age of 28. (I went to a lot of meetings where I was the only woman.) Completing a Ph.D. in a new field (psychology of women) at the age of 50.
- I founded the company. I have found and landed a number of company clients. I have trained about 30 people in various kinds of technology in the last two years.
- The biggest accomplishment in my career probably was giving a technical talk to a group of European experts, and impressing them. The work was achieved in a team, and I was the only woman. I got a lot of recognition for it.
- The value I contribute to this company is to run interference for the other engineers.
- I created the company.
- I’m a webmaster. I do technical support of a marketing website and content development for marketing materials.
- I am in the midst of two quality improvement processes.
- I write top-quality manuals for telecommunications products.
- I mentor to people when they need advice.
- I am loyal, steadfast, dependable, sharp, and energetic.
- I like to think the most valuable role I play is to communicate with the developers as friends and colleagues and try to understand their needs and goals. I often have to translate this to our president who is less sensitive, but at least he knows it, and he has come to rely on me for this translation.
- I have primary responsibility for a major release of our product. Since the project is not complete, I have not yet gotten any awards. However, I have been promoted and have received healthy raises as a result of being involved in this project.
- **[V7] What recognition have you received that was the most pleasing the valuable to you?**

[Note: very few respondents mentioned any kind of monetary reward.]

- I received a divisional award.

- Receiving a hardware patent.
- A personal note from the chairman of the board congratulating me on a particular analyst milestone. A standing ovation at one of my speeches.
- When some directors read a paper I had written recently, they said I had a unique ability to describe difficult concepts clearly. That recognition was valuable because it helped me notice and develop my strengths.
- The best recognition is when one of our readers writes and thanks us for helping him or her accomplish something.
- At a recent meeting my boss said that I did a “wonderful job” and everyone in the room gave me a round of applause.
- I found a major [technical] problem and pursued it to the highest ranks to get it fixed. The regional director was amazed that I had pursued it without a push from a VP. He said most people would have dropped it in the early stages. I did not get any formal recognition, but this comment alone was enough.
- Simple and sincere thanks from the people that reported to me.
- When I was 25 I interviewed for a job where my competition was 90 percent Ph.D.’s (I had a B.A.). Because it was a prestigious university where credentials count, I felt sure I would be ruled out. However, I was offered a job by the director and she became one of my most valuable mentors along my career path.
- **[V8] Have you ever been “elbowed out” of receiving credit for one of your accomplishments? Describe the situation. Did you protest? To whom? What was the result?**
  - It happens all the time in meetings. I make a proposal. It’s ignored. Then some fellow speaks up, represents it as his, and he gets the credit.
  - Many, many times. But that is the way “the guys” play hardball. It is not appropriate to protest — we merely seem like we are weak and are whining about it. Instead, it is essential that women learn how to get credit for their work.
  - In 99 percent of the cases I did not protest, because I’m basically a team player. However, whenever there has been an opportunity to set the record straight, I have done so.
  - In these cases I have chosen to “move on” and not archive those experiences. In general, I have found that protesting does little good, and sometimes a lot to the bad. (I say this, yet I am currently experiencing some bad due to my protesting a situation — I guess I can’t take my own advice!)
  - Yes. I wrote a full report on a project I accomplished on my own for an engineering company. The manager I reported to took my name off, put his on, and took all the credit. I protested to the manager in front of the general manager, who told me, “If there’s a disagreement between you and one of the men, you lose!” I quit soon afterward to go into business for myself.



- I lost first authorship of my first paper, when I was a graduate student, to a male postdoc. I protested, especially since I had done most of the work. My advisor, who was both chauvinistic and racist, favored the man. I lost.
- When I took the job of director, it was because the VP had left the company. I took on all his responsibilities, plus some, but still the president is not comfortable giving me the title of VP. I asked him about this directly and he can't explain it, but it is his decision. He has gradually come to show me the same respect and trust as the last VP, but my title has still not changed. On my one-year anniversary I'll ask for the VP title and profit sharing instead of commission. If he says yes I'll stay, and if he says no I'll look for a new position.
- At my previous company I wrote several high quality market research reports. I was laid off by the company and my boss put his name on the reports.
- The school district I worked for took the curriculum materials I developed and sold them and took credit. (I didn't even get authorship.)
- I assisted the department head for over 14 hours in a tight-deadline situation. He didn't let anyone know I helped him and didn't want anyone else to know.
- Absolutely. There are too many situations to describe here. I've appealed to many different levels from HR managers to senior vice presidents. From my experience these people simply prefer to believe a man's view.
- This is the main reason I became an entrepreneur. I have never had a manager in a large company who did *not* take credit for work I have done.
- I was involved in a software development group with a male manager. He had a male protégé that consistently took credit for ideas I proposed in private. I also received a negative review that was probably due to the protégé's comments. Protesting to my manager got nowhere. The protégé left and the situation improved dramatically. I received an excellent review and bonus.
- Absolutely. I was a technical marketing support analyst and established a client base of \$300,000 from a base of \$0 within one year. My marketing manager took the credit with upper management and got a large bonus.
- To present ideas in a way that they will be accepted by my management structure, I have to arrange to have one of my male co-workers do it. Otherwise things just don't get done.
- Many times. In technical fields there seems to be a glass "crawl space." In computers/software you have to update your career every 6 months to 2 years. So, either your own company promotes you and has an investment in your continuing training and advancement, or you have to go where the interesting work is. As a result, there is little or no "seniority" per se in the "technology de jour" world. The ultimate result is that I decided to start my own company instead of continuing to be passed up for promotion or having to hop from company to company.
- At one place I worked I often contributed to projects as a member of a larger team, but when the teams were recognized, I was often left off the list. However, I never protested the situation, feeling that it was a really petty thing to do. The

result was that I eventually left the company because I was feeling very under-appreciated.

- Yes. I was working on a team of two men and myself. I did most of the work and they took all the credit. Instead of protesting, I just kept quiet and went to work on something else. They wound up looking like fools because they couldn't maintain the application because they really hadn't written it, like they claimed.
- Many times. One particular situation involved a manual set at a company where I was asked to produce a draft in a short amount of time. It required weekend work, and when I came in on Saturday I found the working papers gone from my desk. After an hour of frantic searching, I found them in a lab, with two other people working on the book.
- I have been stabbed in the back by as many women as men.
- A colleague took credit for my work. I protested to the colleague and she accused me of not being a team player, and I dropped it. It made me realize that other women can be your enemy, just as ruthless as male colleagues.
- I have always found that when someone takes credit for my work, it is a form of flattery. It also doesn't matter since recognition is short-lived.
- **[V9] Have you ever passed up an opportunity to take “proper credit” for one of your accomplishments? If so, did you kick yourself afterwards? Did the experience change your attitude or behavior? How? Do you think women have a “natural modesty” that sometimes prevents them from seeking the limelight?**
  - Yes! I have struggled with this issues for years — how to ask for recognition appropriately without sounding like an ego-maniac. Any help with this issue would be greatly appreciated!
  - I have never done this, as it is not my personality. I think it is a problem that this concept is constantly revisited because it sets up a double standard whereby women who are not naturally modest start to think that there is something wrong with them!
  - I often include others in the “credits.” We do very little completely on our own. That means I'm always a part of several people's accomplishments, and they are a part of mine.
  - I believe the role of a manager is to put the right people in the right jobs and enable them to succeed. I think I have been given “proper credit” in terms of promotion and raises, because when my employees succeed, I succeed.
  - I have never passed this up, but as a result, I have been called “self-promoting” and some other not as nice words. Yes, I think women have been socialized to hold back when it is time to take credit. This has been a major reason why women tend to get promoted more slowly than men with similar experience.
  - Outside my work life I'm probably as “naturally modest” as the next woman, but I have made a conscious effort not to do that at work because I knew I wasn't doing myself any favors. If I didn't look out for my career, who would.

- I almost did it again with this survey. But I decided I may as well allow you to use my name and follow up with me if you thought it interesting.
- I continue to work on simply saying the words “thank you” instead of “oh, it was nothing, modest excuse, etc.” in response to a compliment.
- As I get older, I realize you have to “toot your own horn.”
- I am not stupid to pass up an opportunity. And I don’t think women have “natural modesty”! When they control things they are as much of a power player as anyone else.
- No, women don’t have a “natural modesty” that prevents “them” from seeking the limelight — we have a very deep set of fears of sticking our heads up too far, based on hundreds of years of serious abuse if we did.
- Natural modesty is not in my repertoire. That may be in part due to my great-grandmother, an active suffragette, and my grandmother, who received her law degree in 1929. I grew up in a “gender neutral” family, where we all learned that *people* can do whatever they choose — no differences between boys and girls.
- I’m not sure where the cycle started, but I don’t tend to value the work I’ve done, perhaps because I didn’t get recognition for it. And perhaps I didn’t get the recognition because I didn’t speak up. And perhaps I didn’t speak up because I previously hadn’t gotten recognition.
- Many times I have wanted to relive history so that I would react differently. Women do react more modestly in a male-dominated environment where this does not work. I tell my “mentees” to swallow hard, and slowly but firmly mention the facts during one of these episodes. It helps to have a critical mass of women in the room to feel comfortable enough to speak up or a friend who is on the same wavelength.
- Not on your life. If a woman has “natural modesty” then she learned it from her mother or aunt or grandmother or whoever. It’s not an instinctual thing for women to be any less aggressive than men. I don’t have any natural modesty and am proud to stand up for what I have done, good or bad.
- I think women are taught to stay out of the limelight. Our culture teaches us that in families men are the head of the household and women abide by their decisions. We, unfortunately, carry this conditioning with us into the business world.
- Some women do not have the knack for identifying projects or opportunities where their results will be very visible. These projects typically are high risk.
- Yes, that’s often the case; however, the younger women in the workforce don’t seem to have this impediment nearly as much as many older women.
- Yes, and I have mentally kicked myself. I don’t think it was modesty rather than good manners and being too cautious. However, in time I realized that I had to become a stronger person which included accepting credit and recognition for my accomplishments.

- One thing I notice is that the women in my workgroup tend to classify themselves as “not very technical” or “less technical than the men” in our group. I believe they’re not so much less technical as they are lacking in confidence when they don’t know something. The men in our group never do this, yet I see them in as many positions where they don’t know (but don’t show it!). They keep their fears or lack of knowledge to themselves instead of highlighting it.
- Some amount of natural modesty, and some amount of just not understanding “the game.”
- Yes, yes, yes. This is something I learned the hard way, more than once, I’m sad to say. I once wrote a program that was truly innovative. Someone else in the organization published an article about the software. He took credit for my work and got his photograph in a marketing newsletter. When I said something to him he just brushed it off. I fumed inside for ages.
- I have learned to measure my accomplishments, particularly when I was a contractor, by how much I was actually getting paid.
- Yes, I think women have a natural modesty that prevents them from seeking the limelight. Even when a situation is going down the wrong path, women will shy away from confronting the truth. One of the reasons is fear of being discredited because of being an “emotional woman.”
- I do not agree with the “natural modesty” theory. I think there is some social conditioning in families that some women have had to overcome. Luckily my family culture includes strong women with assertive personalities, including my mother, both grandmothers, and my mother-in-law.
- People who spends their time worried about getting in the limelight needs to really think about their values. I believe women come across as being too aggressive.
- I rarely miss getting “proper” credit but rarely “blow my own horn.” I do think women have a “natural modesty” that sometimes prevents them from seeking the limelight. But I’d call it a social instinct to avoid emphasizing the self over a societal group or tribe.
- There is no “natural modesty.” There is cultural indoctrination on “proper” behavior.
- I have passed up credit on occasion. It did not seem worth causing strife with my [female] boss at the time. Sometimes I’ll joke that it was my idea. I’m usually amazed that the simplest comments on very obvious points actually result in credit. I usually assume (incorrectly) that everyone already has thought of something when they haven’t. For that I kick myself and vow to speak up sooner.
- I do not pass up opportunity, period. I may have in the past, and probably did kick myself, but I quickly pick myself up, shake off the dust, and go at it again.
- I do believe that it is difficult for women to accept credit or seek the limelight and I have experienced those attitudes in my own career.

- [Women] are so used to being taken for granted, it's as though we think we don't deserve some limelight.
- I agree that women have a "natural modesty." Sometimes it's too hard to keep yourself straight in this "man-dominated" business and modesty seems the easiest direction to "bend" yourself. This may not be the best way, but we can learn something through these "bending" experiences.
- Not my problem. My mother ran her own business. She trained me from an early age.
- I think in general women do have a natural modesty or are more humble.
- I share the belief that women tend to stay away from the limelight or "toot their own horn."
- When I was growing up I was very quiet about things like volunteering that I'd done well on a math test to classmates. I was happy to do well, but I was afraid of classmates labeling me as a "nerd."
- **[V11] What caused you to leave your last job? Did the issue of "value" play a significant role?**
  - My last job was a dead-end job without much growth potential.
  - A misogynist caused me to leave my last job.
  - I was laid off because my [male] boss feared I was going to take his job. They told me I didn't "fit in."
  - I had reached all my [career] goals — had the corner office with the view, my own secretary (which I thought was very important), a parking place and the right title, but every day when I got into my office I had tears running down my face because I was doing absolutely nothing that mattered. I knew I had to get out and do something that got my pulse beating again.
  - Brick walls everywhere. And finally, I got frustrated when promotions and new jobs went to younger, prettier women — and men! (I'm only 35!)
  - I was working 70-hour weeks and not getting enough out of my life for what I was putting into my job.
  - I left my last position because of the work environment. It was highly political and unsupportive of the employees.
  - I left a department because I didn't feel valued. The male manager was shocked when I didn't want to stay after they demoted me a job grade with no explanation.
  - [In my last job] I was constantly reminded that I had no value in this group and if they worked at it enough perhaps I would just disappear. One of the managers literally told me not to worry my little head about how the project I was managing would be handled technically.

- I left because the company failed to acknowledge the value I brought and the business I built. Also, I was criticized for “overachieving” and “making the men look bad.”
- I wanted to have control of my professional life.
- **[V12] How would you advise a daughter or younger female colleague on the issue of “getting credit where credit is due”?**
  - Toot your own horn. Don’t expect people to recognize your accomplishments.
  - I would advise my daughter to stand up and be counted for her accomplishments, in a gracious way.
  - To quietly, politely, and persistently make sure people know you had a key role in making this happen.
  - A woman who stands up for herself, or is outspoken or direct, is labeled “pushy,” “a bitch,” “conniving,” or “aggressive.” Men displaying these same behaviors will be recognized for their direct and assertive approach. It’s hard to blame the individuals in this situation since it is society that creates this sort of bias.
  - Document everything. Make sure that your name is on everything you develop.
  - Never be afraid to leave your job when you are being treated unfairly. As corny as it may sound, you can’t soar with eagles when you fly with turkeys.
  - I wouldn’t “advise” her about any of this. I would *show* her how to do it; I would train her thoroughly in doing it until it became second nature to her.
  - Find a way within your own style to bring up your accomplishments. This may be indirectly or with a lot more finesse than men would use, but it has to be a way that you are comfortable with. Make sure people who count know what you have done.
  - I would advise a younger woman to insist on parity in terms of wages, respect, and advancement. My modus operandi is honesty and forthrightness — cards played face up on the table. I have little tolerance for hidden agendas. My strategy, if I’m feeling misused, is to deal directly with the offender, and if that does not work, with the offender’s superior (in full view of the offender). The ultimate response is to take my valuable contributions elsewhere.
  - Read Machiavelli, and understand that everyone is your enemy. Watch your backside, and don’t be shy about self-promotion.
  - Take a deep breath, smile, and then toot your own horn, because few other people will do it for you.
  - Take opportunities to share with management what you are doing. This doesn’t necessarily mean “bragging.” I means giving status and communicating on a regular basis — “face time.”
  - I would tell her (and try to keep the bitterness out of my voice) that she must tactfully but consciously let people know about what she’s doing.

- Expect credit for your efforts but do not expect it automatically. Make sure that your management chain and peers know what you are doing while you are doing it. There are lots of people including your own manager who will gladly take credit for your work even before you finish it.
- Take the long view. What will taking credit now gain you in the long run?
- Keep good records, publish shamelessly, stand up in meetings, present your success.
- I would like to encourage her to have no reason to feel shy about talking about her accomplishments. I don't have any idea how to overcome that feeling once it has developed other than to consciously work at it.
- In meetings where men constantly repeat what a woman says and present it as their own [idea], women need to say, "Yes, I agree with you — that's what I just said." (It's almost fun to see men blush when this happens.)
- This is hard. I have a daughter (almost 9 years old) who is already aware of the "boys" vs. the "girls" thing in the credit area.
- Seek a true mentor, male or female, wherever you go!
- Market yourself. Keep your resume and portfolio updated with important accomplishments.
- Keep your sense of humor and be prepared to address the problem [in a professional manner]. If the problem is systemic, move on! Vote with your feet!
- Do not be afraid to assume that you will get credit where it is due. Do not skirt around the issue when dealing with superiors, but at the same time, do not focus on it too much. Always include other team members in credit, where possible.
- Be forthright in stating what your expectations are: That if you do a [good] job, you expect to be recognized for it.
- Be honest. Include all contributors. Speak loudly enough to be heard. Don't exaggerate. Pay attention!
- Seek managers that believe in giving credit.
- The best way to get credit is to give it. If I make sure people reporting to me get credit for their contributions I am modeling the behavior I desire.
- Creating an environment where colleagues and subordinates feel free to share credit because there is plenty to go around.
- Seek visible, risky assignments.
- Put your name on the cover page of all presentations.
- Learn who are the good people and who aren't. Then CYA where necessary.
- If you have to, leave. That would be true for everyone.

- Find a company where you have a good chance to begin with. If you hit roadblocks, wait a year. [If it's still not working,] move on. After 40 it is much more difficult to move on, so you'd better find a place where you have a fighting chance before then.
- Women should mentor each other.
- Women should overcome our training to protect men. I'm not saying we should bash men, I'm just saying that we must stop treating them as superior.
- Don't dwell on past grievances but go out and make tomorrow a great day. Ignore the inevitable jerks out there; they are like the weather. You can't make it stop raining, but you can remember to bring your umbrella with you.
- Be firm and strong about your ideas and network well. Give credit to others you work with and make sure your efforts are acknowledged.
- I do not agree with the philosophy of this question — you do not add value just because you are a woman! If by "woman value" you imply certain characteristics, qualities, habits, they can be found just as much in men as in women — it's only a matter of conditioning. If women have some of these "qualities" now because they did not come to the workforce early enough, they will not have them in the next generation, because they will learn the ways of the working world as men did! So to highlight those qualities now would be to dig a grave for ourselves for the next generation.
- **[V13] Name three obstacles or challenges you face in achieving your career goals. To what extent are they self-imposed and to what extent are they related to barriers in your organization?**
  - Insecurity. Cultural barriers: Most men are more comfortable with other men, and they interact in a way I am not familiar with. It's difficult working in an organization that values "individual results" over "team results." I'm an incredible team player and support person — I'm not interested in working alone all the time.
  - The right contacts. Asking for things. Generating PR.
  - Men, men, and men. I have always worked in fields that are male dominated. If I'm assertive, I'm pushy. If I'm easy to get along with, I'm a pushover. This is the most redneck and racist organization I've ever worked for.
  - Being "too nice" and not knowing how to be fair when it means not being friendly or angry when it is appropriate to be. This is definitely self-imposed, and I am getting better at it.
  - In most organizations there is a very visible "glass ceiling." Overcoming this obstacle will take women entrepreneurs who are successful in forming companies that eventually are as successful as the companies formed by Larry Ellison, Bill Gates, et al. Then there will be women at the top. But there is more than being successful within a company. It is also the financial world that affects the success of women. To get funding for ideas requires money, and money grows on very conservative trees.



- Men have viewed me as a sexual object rather than as a business colleague and peer.
- Wall Street's perception that having a woman running a company is a higher risk than having a man run it.
- My age (58) doesn't help. I don't look it, I don't act it; and [yet] I see assignments going to younger people with far less experience. This is a new thing for me.
- I must modify my preferred style to appeal to male-oriented organizational systems.
- Getting people to articulate exactly what they want and expect and to be accountable for the consequences their choices cause. This is self-imposed, and I am learning (via classes and practice) to return the ball to the other person's side of the court and ask for clarification and specifics.
- All my real barriers are due to my own fear of success.
- Having a husband and kids is definitely an obstacle to career goals. Because I want to spend time with my family I do not work excessive overtime or travel a great deal.
- Men would rather give the promotion/business/assignment to another man.
- My biggest obstacle is a workaholic tendency; I become obsessed with perfection in small things and become less effective at getting big things accomplished.
- Being ahead (strategically) of what my organization can implement. Trying to do too much at once!
- Education: I have a B.A. in advertising but have been in a technical position for six years.
- The company places little value on the human spirit. We get a few pats on the back, but mostly we are "producing machines."
- Organizations recognize that they've got people problems, but continue to hire people who want nothing to do with people. Then they wonder why they have problems!
- The "old-boy network," which I describe as a "take a number and stand in line" mentality.
- My unwillingness to play "the game" (self-imposed).
- The focus on economic imperatives and burnout.
- I devote so much time to work that there is little left for learning, which we all need.
- Glass ceiling, less value placed on my type of skills, small company with not a lot of room to grow.

- The biggest obstacle at the moment is the lack of worktime flexibility. I have a small child and our organization is unwilling to allow a work-at-home arrangement. The next obstacle is the organization's perception that a woman is unsuitable to the CEO. I have been discouraged from seeking that position and it is directly attributed to gender.
- **[V14] Name three science or technology organizations you believe are great places for women to work.**

[Most respondents did not answer this question, or reported that they couldn't think of any.]

- I personally have not found any "great places" for women. I have found places that were more tolerant than others, but none where it is really great. In a survey of 500 CEOs, 100 percent of those surveyed said (anonymously) that they would prefer an all white-male environment if they were given a choice. The folks at the top are still not "with the program."

[The following were mentioned, at least once.]

- Adobe Systems
- Advanced Micro Devices
- Apple Computer [mentioned by many respondents, but almost always in the "past tense"]
- AT&T
- Bay Networks
- Bellcore
- Cisco
- Electronics for Imaging (EFI)
- Federal Aviation Administration
- Hewlett-Packard [multiple]
- IBM [multiple]
- Informix
- Intel [multiple]
- Larscom
- Lotus
- Lucent (Bell Labs)
- Marimba

- Microsoft [multiple]
- Motorola
- NASA
- National Semiconductor
- Netscape
- New Venture Strategies (women owned and operated)
- Novell [multiple]
- Oregon Health Sciences University (where parental leave is gender-blind)
- Park Scientific Instruments
- Scios Inc.
- Silicon Graphics [multiple]
- Sun Microsystems [multiple]
- Tandem
- University of Texas at Austin
- Xerox
- 3COM
- **[V16] Given background and capabilities equal to other candidates, do you believe you have equal opportunity to be the CEO of your organization?**
  - Yes: 21 (29%), no: 37 (51%), declined to state: 14 (19%)
  - It's an "old boy's" company — the men have been in line for years. Women will die before getting in line.
  - No way! That's another reason I'm leaving.
  - I am the CEO.
  - No. The semiconductor industry is extremely male-centered.
  - Not in your nor my lifetime! I don't look like an old, white male.
  - I made an organization to make this possible. I didn't believe it was possible otherwise.
  - Not in this organization, but when I have my own company some day.
  - In companies where I have worked over the years, no. In my own company, yes.

- No. Senior management positions have a lot to do with politics, who you know, and influence. Background and capabilities count for little beyond middle management.
- **[V17] (If you are or have been an entrepreneur) Why did you start your own organization? Did the issue of “value” play a role?**
  - Absolutely [value played a role]! When doors won't open, sometimes one just has to create new doors.
  - I started my own company because I wanted to be rewarded for my efforts and merit and not have to be subjected to meaningless job appraisals and useless staff meetings.
  - While this does not currently apply to me, let me say why I want to do it: I've seen too many women as they age (40 seems to be the age) get passed over for promotion for younger, less experienced women.
  - Many women aren't having children until they're older, and they want to cut back on work time. I want to be my own boss to get out of the corporate prejudices and the structure my time the way I want it for my family. Jobs come and go, and so do careers. Family is just too important.
  - As an entrepreneur, I work for someone I can trust completely — me.
  - I started my own company because I could do a better job of delivering value to customers if I were in charge than I could as a player in someone else's organization.
- **[V18] (If you do business internationally or have contact with science and technology colleagues in other areas of the world) How would you compare the perception of women's value here and in other countries?**
  - We have it better in the U.S. than anywhere else, but we have a long way to go.
  - I believe that women have more opportunities here than our sisters in Asia. Women in engineering, law, and business are still an anomaly there, and there is an expectation that they will quit when they find a suitable husband. Not true here.
  - North America is far ahead of Europe in terms of women being decisionmakers. In the UK and France particularly, I rarely met women within my meetings, except as assistants to executives.
  - At a business-computing conference attended by over 1,000 people in France last year, I believe that less than 10 percent were women.
  - I have seen virtually no women in management or authority positions in Japan, and very few in Europe.
  - I believe that Europeans accept bold, adversarial approaches in women, while the U.S. accepts a greater variety of styles.

- The Europeans are way behind us, still resorting to off-color humor and sarcasm to put women down. The Japanese have no women in technical jobs.
- I deal with people from all over the world. The European men I have worked with have been great to work with; however, they work for an American company so they may be an exception and I just don't know it. The people from Canada and South America I deal with are all women so no problem there. Then there is Asia. The Japanese men and women clearly have a caste system. The men talk and the women are quiet and subservient. For China, Hong Kong, Singapore, and India the men I work with respect me and I have not experienced any problems. However, when they are with their families their wives are subservient and obedient. They seem to have a double standard for women — those in business the those at home. If you are woman of power then you are respected.
- The international organizations seem to have less of a problem with women. I do not know why.
- Sometimes I feel that the U.S. has more discrimination against women than Japan.
- We have far more freedom to express our opinions, create and deliver projects/programs/products, and be treated as equals in business than in most areas of the world. So much so, in fact, that I tend to have men in our organization be the primary initial contacts for international customers, until it becomes clear that I will be accorded equal respect.
- Women in Oriental countries seem to be given more opportunities to advance than in Western countries.
- Women in this country don't have to be sex objects to get their points across.
- In Japan and Europe I have found that I was valued equally with American men; however, Japanese and European women technologists were not equally valued with their male counterparts.
- Canada is more progressive than the U.S. about recruiting and maintaining a decent ratio of women.
- In many foreign countries women still tend to be excluded from positions of authority or visibility. The exceptions are Sweden and Israel.
- Europe has more enlightened social policies that support working mothers in incredible ways.
- I don't see many women in upper level professional positions in my field in Europe of Asia.

### **WITI Regional Meeting Focus Group Discussion**

The topic of this paper was the focus of discussion at the WITI March 18 Silicon Valley regional meeting. The meeting was hosted by Xilinx in San Jose, and short presentations were given by Chris Taylor, vice president of Human Resources, and Sandra L. Sully, vice president and chief information officer.

**Chris Taylor, vice president of Human Resources, Xilinx**

- Tell me what you can do rather than what you can't do.
- Partner with somebody — get meaningful feedback on your style and your performance.
- Ask for what you want. Women often don't want to be pushy, but "the Aladdin factor" works!
- Know where the power is and learn to get along with it.
- Don't be hypersensitive to the issue of sexism. Don't make sexism an obstacle.
- Never lose sight of serving the needs of your business.

**Sandra Sully, vice president and chief information officer, Xilinx**

- Focus on how to solve your customers' problems.
- Don't focus on "the stuff" you do — focus on the value you bring to your organization.
- Don't let others take credit for your ideas.

**Meeting discussion**

- Women need to learn to help one another.
- Women don't realize they have the power to help one another.
- Women are often not that good at helping one another — we spend too much time giving abstract advice.
- As women get up to the higher rungs on the ladder of success many of them tend to divorce themselves from women at lower levels.
- It's easy to express value in terms of bottom-line results if the goals are clearly spelled out (It's a "two-way street.")
- Women tend to talk too much. It doesn't pay to give away too much information.
- Women don't take risks as well as men.
- Executives can't afford to socialize with "the troops." Don't be too open about problems within the business organization.
- We need to break the military model. At [my company] we call ourselves "bridge executives." We're devoted to an inclusive model. We're trying to make changes *now*.
- When I'm CEO I'll create a new paradigm. In the meantime, I can't get ahead without playing the game "their way." And I don't mean I have to compromise my integrity. I simply have to learn a variety of strategies that are effective in the real world.

- My manager isn't interested in my ideas.
- Men are always stealing my ideas!
- If we perceive that the high-ranking women in our organization are not in power network, we don't believe that they have value (or understand what their value is).
- Hiring a woman is often looked on as a tremendous risk: If she fails, you fail.

### **Barbara Beck, vice president of Human Resources, Cisco Systems**

Barbara Beck's father had a passion for science teaching that instilled in her an appreciation of science and technology and the drive to make a difference. Beck wanted to be a science teacher like her father, and to accomplish her educational goals she put herself through college by juggling three jobs. After getting her natural science degree and a California teaching credential, she taught school in the San Francisco Bay Area for several years.

When Beck decided to try a new career she chose human resources. After a few years at several high-growth technology companies, she joined Cisco Systems when the company had only 44 employees and an annual revenue of \$27 million. The growth Cisco has enjoyed since then beat anything Beck had ever seen before and has become the stuff of Silicon Valley legend.

"One area where I often see women (and also men) doing themselves professional harm is in not promoting their ideas well. It's difficult for some people to state their ideas crisply and to indicate what the bottom-line value is. That's especially important in high technology where clear thinking and objective data are greatly valued."

— Barbara Beck, vice president of Human Resources, Cisco Systems

**WITI:** It seems that you joined Cisco at a very opportune time.

**Beck:** It's been both wonderful and also extremely challenging. There aren't many who stay with a company from the start-up stage to the time it becomes a multi-billion dollar organization. More than once in recent years I've wondered whether I could scale my HR expertise up one more notch. Fortunately, the people I work with, and for, have been helpful and supportive in giving feedback and encouragement through the plateaus and transitions.

**WITI:** How do you and the other women at Cisco contribute to the company's bottom line?

**Beck:** The best solutions come from an evaluation of diverse ideas! Cisco really values diversity in all its forms. To continue being successful we need people who challenge the status quo — the old ways of doing things. Women tend to be good at doing that, but we really look for that characteristic in everybody we hire, and after people have been here awhile we encourage them to keep reinventing themselves and looking for new and more creative solutions.

**WITI:** What about opportunity in general for women in high technology? Mary Ann Byrnes of Corsair Communications has been quoted<sup>1</sup> as saying that there is more mobility in high-tech companies because there isn't a man with 20 years' experience in line for the job ahead of you. Do you agree with Byrnes?

**Beck:** Yes, I think high tech provides tremendous opportunity. The industry doesn't have a male-dominated tradition, and the current high growth period offers a wide variety of possibilities.

**WITI:** You're responsible for a non-technical function of the company. Does the fact that you don't have day-to-day contact with product decisions give you less credibility with your peers?

**Beck:** How would it be if I pretended to be an expert in engineering! My expertise is in people and organizational dynamics. It helps that I have an understanding of our products and what our engineers and other technical people do. But credibility in any field comes when you can show a value-add through your involvement.

**WITI:** What are some of your current challenges as one of the few women officers at Cisco?

**Beck:** In intense debates, it is sometimes difficult to get a word in edgewise — frustrating when I know I can add value, yet having trouble getting into the discussion. However, through time I've learned some techniques to steer the participants into an area where I can promote my solution. Asking a question sometimes works well.

**WITI:** Are there some areas where in your opinion women keep “shooting themselves in the foot”?

**Beck:** One area where I often see women (and also men) doing themselves professional harm is in not promoting their ideas well. It's difficult for some people to state their ideas crisply and to indicate what the bottom-line value is. That's especially important in high technology where clear thinking and objective data are greatly valued.

I had an example of that just the other day. I was trying to help some people solve a problem, but I wasn't sure exactly what the problem was. I asked two people to explain it to me, and one did so in a short, crisp voicemail message that ended with a recommended solution. The other one used up one 5-minute voicemail segment and then spilled over into a second segment. And after I had listened to both segments, I still didn't know what the problem was!

**WITI:** How can an organization like WITI help women in science and technology become more professionally competent?

**Beck:** I think networking, mentoring, and coaching are very important. Getting a “second opinion” about workplace situations and then trying out worthwhile suggestions can definitely lead to personal and professional growth.

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<sup>1</sup> “Women of the Valley,” *Forbes* magazine, December 1996



## **Nora Denzel, senior vice president of Product Operations, Legato Systems, Inc.**

Nora M. Denzel is currently the senior vice president at Legato Systems, Inc., a leader in the storage management software market. She has over 12 years of experience in product engineering and marketing in the computer industry. Prior to joining Legato, Denzel was director of storage management software in IBM's Storage Systems Division. At IBM she held various engineering, marketing, and executive positions all pertaining to enterprise-wide storage management software. Denzel received a B.S. degree in computer science from the State University of New York and an M.B.A. from Santa Clara University.

Career advice from Denzel:

- Most organizations are in business to make a profit. Always express your value to your organization in bottom-line terms.
- If I ever found myself in an organization that operated in a style that was not familiar to me, or operating in a paradigm that could be called “militaristic” or “dominated by more traditional male characteristics,” what worked for me was to try to understand the rules of the organization, and learn to get ahead by adapting my style to fit the style of the organization. It was my intent to run the organization, and then change the way it operated **after** I ran it, not while I wasn't the leader.

Even if my own management style was more inclusive, and I was more willing to accept alternative management styles, I would adapt my style to the organization to which I belonged.

- We do need more diversity in technology organizations. In some companies all the senior managers think alike, dress alike, and look alike. The “cookie cutter” approach doesn't work in today's culturally-diverse marketplace.

I believe I got my current job for two reasons:

- I delivered in my last job.
- I provide a complementary perspective that helps to “round out” the management team.

I'm glad to be working for a company that values my contribution in both areas.

- Don't operate on the assumption that you have to share everything with everyone all the time. For example, it is very important to project to your group the belief that the organization is going to meet its goals, even if you have some lingering doubts in the back of your mind. It is important to take some prudent risks and act very confident, even if you have some doubt.

I believe both men and women have doubts, but typically a man won't let on, where a woman sometimes will — don't let that be you.

- Keep your eye on the prize. What's your career objective? How important is your current focus in achieving that objective? Give up the “small stuff” so you can stay focused on what's really important.

## **Pamela Meyer Lopker, founder and president, QAD**

### **Also participating: Peggy Biddison, vice president of Marketing, QAD**

QAD, with headquarters in Carpentaria, CA, was founded in 1979 by Pamela Meyer Lopker, who at that time was 25 years old and a recent graduate of the University of California at Santa Barbara.

QAD offers a variety of enterprise resource planning (ERP) products to key manufacturing industries within the automotive, consumer products, electronics, food and beverage, industrial products, and medical sectors.

QAD is a privately-held company with customers in 76 countries and over 700 employees working in 19 countries. The QAD software is available in 24 languages.

In June 1996, Pam Lopker was named “Entrepreneur of the Year” for the Greater Los Angeles Area in a ceremony sponsored by Ernst & Young.

“Women in some cultures are perceived as simply being less credible — no matter how knowledgeable or capable they are. Sometimes I choose not to hit that head-on, and send in a man instead. I am, after all, in business to do business, and if cultural differences prevent that from happening I try to set limits on pressing a point.”

— Pamela Meyer Lopker, founder and president of QAD

During 1996 Lopker was profiled in three issues of *Forbes* magazine — in October she was included on the “*Forbes* 400” list as the richest self-made woman in America; two months later she appeared on a *Forbes* cover with 19 other women technology entrepreneurs and was profiled for the cover story, “Look Who’s Making It Big in Silicon Valley.”

In 1995 Lopker established the QAD 2006 project that offers Santa Barbara South Coast elementary school students an introduction to the Internet.

**WITI:** Let’s start back before you founded QAD. You have a joint degree in economics and math. How has your educational background contributed to your business success? If a college-age woman is primarily interested in the business or marketing side of high technology, would you still recommend getting a technical degree?

**Lopker:** Yes, I would. If I were doing it over, I might choose computer science over math — there’s not a lot you can do with a math degree by itself. However, with either one you’re learning valuable base skills. Even if you don’t stick with software engineering it gives you credibility in the engineering world — and technical credibility is just as important on the business side.

**WITI:** You founded QAD right out of school. Did anything in the education process prepare you for the life of an entrepreneur?

**Lopker:** No, I think entrepreneurship is innate — it’s either in the blood or it isn’t. I probably would have been an entrepreneur even if I hadn’t chosen the high-technology field.

**WITI:** Does entrepreneurship run in your family?

**Lopker:** To a certain extent. My brother is an entrepreneur — but my sister isn't. My parents encouraged all of us to develop our own unique abilities — I certainly never felt that as a girl I was being pigeonholed differently than my brother. We were all encouraged to pursue whatever we were best at doing, and not to accept any obstacles as permanent limitations.

**WITI:** How else was your family an influence on your career choice?

**Lopker:** My early life — both at home and at school — was very egalitarian and free of prejudices. We were taught to respect the contribution each person could make as an individual.

My husband [Karl Lopker, QAD CEO] was also raised the same way. And the way we split jobs around the house isn't always "traditional" from a gender point of view — Karl usually goes home first at around 6:00 p.m. to spend time with the kids and make dinner. I follow a bit later to join them.

**WITI:** Mary Ann Byrnes, another woman recognized in the *Forbes* article ["Women of the Valley"] was quoted as saying "There is more mobility [in high-tech companies] because there isn't a man with 20 years' experience in line for the job ahead of you." Do you agree with Byrnes?

**Lopker:** I do. Some of the "button-down" industries have traditional ways of operating that sometimes make it hard for a woman to make headway. High technology is fast moving and fast growing — nothing is set in concrete. That gives everyone — and that of course includes women — a lot of opportunity.

**WITI:** You were quoted in the *Forbes* article as saying you've been places where it's hard for a woman to get in the door, and in situations like that you send in a man. What kinds of situations are you talking about?

**Lopker:** Women in some cultures are perceived as simply being less credible — no matter how knowledgeable or capable they are. Sometimes I choose not to hit that head-on, and send in a man instead. I am, after all, in business to do business, and if cultural differences prevent that from happening I try to set limits on pressing a point.

**WITI:** Are there places where being a woman puts you at an advantage?

**Lopker:** Well, we can sometimes turn the fact that there aren't so many of us to our advantage. If you're one of only a handful of women in a room you're more likely to be remembered.

**WITI:** How about differences between men's and women's management styles? Do women have any advantage there?

**Lopker:** Women often excel in situations where strong communication is required — for example, marketing and sales; they're often good at "reading" a situation and figuring out how to get "win-win" results. Women are often good at collaborative efforts, like projects requiring a strong team. They're also good at selling complete solutions rather than single products — and that's particularly important at QAD.

However, you can't make too many generalizations — women don't have a monopoly on these skills!

**WITI:** It seems to be hard to get beyond one woman on Fortune 500 boards. Are companies in the high-technology industry becoming more “woman-friendly”? Are we making progress there in breaking the glass ceiling?

**Lopker:** I think we are. It's not surprising that there aren't more women on boards of the Fortune 500: Most of them were founded in more “traditional” times. Most men in the top levels of those companies don't have any women in their peer group. But the younger [high-tech] companies follow a different cultural pattern. It will take time to see change across the board — probably 5 to 10 years.

I'd like to see more women officers and board members, but I don't believe in a numbers game: Women need to earn their positions of power.

**WITI:** QAD is a “Silicon-Valley” company located outside the Silicon Valley. Is it an advantage or disadvantage to be in a high-tech “pocket” outside the Bay Area?

**Lopker:** There are some disadvantages, but I think the advantages outweigh them. Housing is extremely tight in the Bay Area right now, and the job market is so hot companies are constantly losing good people to one another. Here in the Santa Barbara area there is more stability, and housing is no more expensive than the cheaper parts of the Valley.

We have a good mix of senior people and new hires, and we're successful at recruiting them from all over the world.

**WITI:** What are your thoughts on being a keynote speaker at the WITI Conference [June 4-6 at the Santa Clara Convention Center]?

**Lopker:** I'm delighted to be participating — I appreciate the opportunity to share my ideas and concerns with other women in technology. And I like being part of an effort that helps women be more successful in their careers and make a greater contribution to the success of high-technology companies.

## The Women of Autodesk

### Carol Bartz, CEO, Autodesk

Autodesk is one of the leading suppliers of PC design software and multimedia tools. It's highly unusual for a women to head a technology company — Carol Bartz is in the 2% minority in that respect.

Bartz has been at Autodesk for five successful years — revenues doubled after her first three years, and Bartz has set her sights on one billion dollars by 1998.

“Being a CEO is not a popularity contest, it is about running a company to reach its highest potential.”

— Carol Bartz, CEO, Autodesk

What kind of management style does Bartz have, and how has it influenced Autodesk?

When asked about it in 1996, Bartz responded, “Being CEO is not a popularity contest, it is about running a company to reach its highest potential. When I came to Autodesk four years ago, I found a company that had gone through tremendous growth with an incredibly successful product, but with little grounding in corporate management, vision or strategic planning. I worked to put some corporate infrastructure in place as quickly as possible, eliminating some planned products and committing to new ones. As a company, we now needed to focus on our customers, our competitors and our core technologies. I moved decisively to address these needs, and while these actions moved against the status quo at Autodesk, I feel that they were the best for the business.”<sup>2</sup>

Sounds . . . Tough. Straightforward. Down-to-earth. Visionary. Typical: Everything any good CEO ought to be.

What's the work environment like at Autodesk? Anything unusual there?

Bartz feels it's very important to provide an environment for employees that balances work and family. Along with the more typical telecommuting and flex-time programs, Autodesk has some that are rather unusual and innovative — like allowing dogs at work.

Bartz also serves as a role model for women inside and outside the company.

As a breast cancer survivor, Bartz has chosen to take an active role in breast cancer awareness and support. She received her diagnosis a few days after starting her job at Autodesk and chose to speak out about her illness rather than hide it. She is now in remission and supports work directed toward finding a cure and supporting other women with the disease.

Bartz is a working mother with an eight-year-old daughter. Because of her concern for her daughter's future she works to promote an equitable world with respect to teaching young

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<sup>2</sup> “High Tech Women Still Struggle,” by Janet Rae-Dupree and Dean Takahashi, *San Jose Mercury News*, June 2, 1996

women math and science. In a recent article in the *Sacramento Bee*<sup>3</sup>, Bartz was quoted as saying, “Girls have got to get under the hood. Otherwise all you’ve created is a fancy replacement for the typewriter. You’ll be able to hire these young women as great Excel or WordPerfect users — and that’s not what I want for women.”

Bartz both encourages and admonishes women and men to continue to work for progress: “Women need to jump out of their element, out of their comfort zone. And you have to ask the men, what are you doing at your company now so that your daughter or granddaughter can be a vice president or CEO of it?”

So what’s it like for women to work at Autodesk, under the wing and in the shadow of such a powerful role model?

### **The Women of Autodesk**

On April 11, 1996, a group of nine women got together to describe to WITI their experiences working at Autodesk. Here’s how the discussion went . . .

WITI: What’s it like to work at Autodesk where the CEO is a woman?

Answers:

“There’s a strong team atmosphere.”

“There’s a feeling of respect for the value everyone contributes to the overall effort.”

“There’s a glass ceiling.”

**WITI:** Recent research seems to say that companies with a woman CEO or several women on the board are usually more “woman friendly” than average — is Autodesk a great place for women to work?

**A1:** There are a lot of positive things about working at Autodesk: The atmosphere is informal, and yet we all take our work seriously. Our work balancing policies are pretty humane.

**A2:** I like the strong team atmosphere — we’re very supportive of one another and there’s a general feeling of respect for the value everyone contributes to the overall effort.

**WITI:** Can you give me an example of how you help each other?

**A3:** I have one — something that happened just the other day. A colleague asked me to help with some old code. My first approach was a quick one-line fix. But he pointed out that the simple fix was too hard for new users to follow. He had a more detailed and user-friendly idea. I agreed with his idea and showed him how to implement it. During the implementation we enhanced his original solution to make it even better.

That was very satisfying. I felt that I had invested my time wisely; we both learned something, and we can in turn pass the knowledge on to others.

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<sup>3</sup> “Computer classes lack key feature: Girl’s faces,” by Illana Debare, 1996

**WITI:** Does collaboration translate into success in the marketplace? Or does all that cooperation tend to slow you down?

**A2:** I think it definitely contributes to the success of Autodesk products. There's actually some internal competition, too — between different groups fighting for resources. Generally it's healthy. But an individual team has a lot of authority over the product they're producing, and that results in a strong and competitive product — which is what we want!

**WITI:** Has Autodesk always been a good place to work? How has Carol Bartz influenced the company environment?

**A1:** Most of us [in the group] haven't been here more than a few years, but I have and I can say that I noticed a change the day Carol arrived. All of a sudden men who hadn't paid much attention to me or my ideas looked at me differently. It was like, "So maybe women **can** make a significant contribution to the company!" It was like they had never thought of that before.

And Carol has been very influential in establishing and promoting the strong team atmosphere. We've had some great leadership training sessions.

**WITI:** It sounds like there's been a significant culture shift in the last few years. Did everybody survive the change?

**A5:** I've been here since 1991, so I remember how it was before Carol got here. Not everybody did survive — some of the managers had a style that didn't fit at all with the new paradigm. Those people left, and others successfully made the transition.

**WITI:** Everything you've told me so far sounds too good to be true — is it really as great as it sounds?

**A6:** Autodesk is a great place to work, but I have some "glass ceiling" stories. I bet other people in this room do, too.

**WITI:** What?! How can there be a glass ceiling when your CEO is a woman?

**A6:** The glass ceiling here is in middle management. It's hard for a lot of us to get up to or past the director level.

**A7:** I've experienced that problem, also. I'm doing what I love to do — I even wrote my own job description, but now that I've been doing it for awhile I'm ready for a new challenge. I'm having a hard time being taken seriously for the management job at the next level.

**WITI:** What seems to be getting in your way?

**A7:** Well, one of the problems is communication — I'm not always tuned in to the "power network." For example, a group of people called a meeting about a subject I consider my territory and I wasn't informed or invited. That hurts.

**A8:** What did you do about it?

**A7:** I found out about it after the fact and I went and asked [name of the person who had called the meeting] and he said, "Oh, I didn't think you'd be interested." I don't know how he could say that with a straight face!

**A9:** That reminds me of the problem [several of us] had where we didn't get invited to [an out-of-town meeting]. I got the same response: "We didn't think you'd want to be there." Of course we wanted to be there!

**WITI:** Have any of you found effective ways to resolve this kind of problem?

**A7:** I groused to my manager. I think maybe the next time they call a meeting they'll invite me. But then a new task force will come along and I wonder whether they'll think to ask me to join that one.

**A3:** I've had some luck hitting that kind of problem head on. But I have a hard time staying cool in that kind of situation. Sometimes emotions get high in both sides.

**WITI:** Does mentoring help this kind of problem?

**A3:** I'll be honest — I could really use some coaching. I wouldn't want to have a mentor from my management chain, though — it should be somebody who can be neutral and objective about analyzing the situation and giving me objective advice.

**A3:** I agree. It's kind of like another team situation — by giving sound advice you can add value to one another's careers.

**WITI:** Have any of you been in a successful mentoring program?

**A5:** I have one bad example. A former manager of mine wanted to play the mentor role, but I didn't really get anything positive out of it. He was always lecturing, always talking down to me. He never once asked me what kind of advice I would find most useful. He focused completely on telling me "how it is" and giving me "rules to live by." I never felt like we were engaged in a dialog. And I could have given **him** some good advice, too!

**A6:** I've had people who gave me informal advice (kind of like we're doing here today) that was very helpful. Both men and women.

**A7:** There are really several kinds of problems I could use help on. One is "getting into the club." Another has to do with communication. I'd like to get some tips on how I can get my ideas across more effectively.

**A3 [and others]:** [We've] found women's networking organizations (like WITI and internal Autodesk groups) to be a great help by providing opportunities for us to talk about common problems and coach each other in handling difficult situations.

**A1:** This has been a good discussion. I'd like to close by saying that we also need to keep talking [in an ongoing dialog] to company executives about problems that need their help to get solved.

**A5:** One last point: A group I was involved in wanted to communicate some negative effects from internal competition. We were all afraid that Carol [Bartz] would not be receptive to our points. We were wrong — she was quite receptive and appreciative!



## WITI Advisory Board Members

### Participating board members:

- **Debbie Arnold, vice president, Relationship Initiatives, Visa International**
- **Peggy O'Connor, MCI branch manager**
- **Tama Olver, vice president, Corporate Information Resources, Amdahl Corporation**

Q: In what ways have you seen women “shooting themselves in the foot”?

A: Using their “feminine wiles” to get ahead — that may work with male senior management but it destroys respect from women peers and subordinates.

— Debbie Arnold, vice president of Relationship Initiatives, Visa International

A: Not working well with others, not expressing their ideas and not making their accomplishments known to management, being perceived as too emotional by using emotional arguments or terminology rather than rational arguments.

— Peggy O'Connor, MCI branch manager

A: Any time women operate from the premise that “being a woman” outweighs other factors in their success, I believe there is the potential to be self-defeating.

— Tama Olver, vice president, Corporate Information Resources, Amdahl Corporation

Q: What is your proudest career accomplishment?

### Answers:

- **Arnold:** Turning around a break-even retail operation for GTE and adding \$4 million to the bottom line in 18 months.
- **O'Connor:** Taking the risks to make career moves from high school business teacher to AT&T Account Executive to MCI manager.
- **Olver:** Accomplishments that change the culture of a team to meet a corporate objective previously unattainable. Example: Creating a high-availability culture for Amdahl's data center operations.

Q: What's the most difficult lesson you've learned in your career?

### Answers:

- **Arnold:** Keeping a balance of being open and considerate but not too personally involved in your employees' lives.
- **O'Connor:** That the most important traits are focus, cooperation, taking risks and making a difference.

- **Oliver:** Letting go when it is time to fail rather than hang on to potential success.

**Q:** In what ways have you seen other women "shooting themselves in the foot"?

**Answers:**

- **Arnold:** Using their "feminine wiles" to get ahead — that may work with male senior management but it destroys respect from women peers and subordinates.
- **O'Connor:** Not working well with others, not expressing their ideas and not making their accomplishments known to management, being perceived as too emotional by using emotional arguments or terminology rather than rational arguments.
- **Oliver:** Any time women operate from the premise that "being a woman" outweighs other factors in their success, I believe there is the potential to be self-defeating.

**Q:** What advice would you give women about keeping "on track"?

**Answers:**

- **Arnold:** Put your work objectives in front of personal gain; be aware of being a role model and the responsibility that implies.
- **O'Connor:** Focus, take risks, make your accomplishments known, and get along.
- **Oliver:** Create an interpretation of negative circumstances that has some power in it — something you can use to make a difference — something far from any sense of being a victim of your gender, background, or the circumstances.

**Q:** In what ways does diversity contribute strength and bottom-line success to an organization?

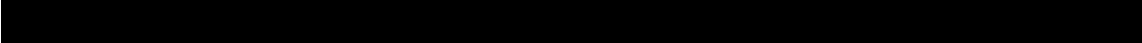
**Answers:**

- **Arnold:** The strongest teams are built from the widest perspectives.
- **O'Connor:** It promotes new ideas, creativity in approach, cooperation, and understanding.
- **Oliver:** Any organization that is uniform in the backgrounds, perspectives, cultures, and genders of its membership is limited with respect to success in the world at large. On the other side of the coin, organizations that are diverse will be able to relate to their customers in many cultures, geographies and markets. In addition, they will have the opportunity to create real synergies across markets and populations that other organizations are likely to miss.

**Q:** How does WITI help you meet your career objectives?

**Answers:**

- **Arnold:** Great networking, helps me keep a broader view on women's issues, opportunity to mentor.

- **O'Connor:** Networking with dynamic, successful, creative women; keeping up to date; broadening my experience outside of my company; providing a chance to give back and to make a difference.
  - **Oliver:** WITI provides opportunities for me to grow as an executive: to learn new skills, understand other industries, and network with other professionals committed to a partnership of men and women to succeed.
- 

## Profiles of Successful Women

### Hall of Fame Award Recipients

The annual Hall of Fame award, which is sponsored by the IBM Corporation, is given by WITI each year in recognition of outstanding contributions women have made to science and technology. The award recipients will be inducted into the WITI Hall of Fame on June 5, 1997, at the annual WITI conference held in Santa Clara, CA.

“The world cannot afford the loss of the talents of half its people if we are to solve the many problems which beset us.”

— Rosalyn Yalow, Nobel laureate

The 1997 recipients are:

- The first programmers in the world – six “computers” selected in 1945 by the U.S. Army to program the ENIAC computer: **Kay Mauchley Antonelli, Jean Bartik, Betty Holberton, Marlyn Meltzer, Frances Spence, and Ruth Teitelbaum**
- **Fran Allen**, IBM fellow and senior technical consultant to vice president of Services, Applications, and Solutions, IBM Corporation
- **Carol Bartz**, CEO, Autodesk
- **Pamela Lopker**, founder and president, QAD Inc.
- **Marcia Neugebauer**, visiting distinguished scientist, Jet Propulsion Laboratory
- **Donna Shirley**, manager of the Mars Exploration Program, Jet Propulsion Laboratory
- **Shaunna Sowell**, vice president and manager of Corporate Environmental, Texas Instruments
- **Patty Stonesifer**, management advisor to DreamWorks and formerly senior vice president of Microsoft Corporation
- **Patricia Wallington**, corporate vice president and chief information officer, The Document Company Xerox
- **Rosalyn Yalow**, Nobel laureate, Veterans Affairs Medical Center

“Women need to jump out of their element, out of their comfort zone. And you have to ask the men, ‘what are you doing at your company now so that your daughter or granddaughter can be a vice president or CEO of it?’”

— Carol Bartz, CEO, Autodesk

### **Pioneer programmers recognized after 50 years of obscurity**

The work done by the ENIAC programmers automated the trajectory calculations done by hand throughout most of World War II. These women are only now being recognized for their contribution as software pioneers.

“I’m pleased that technology organizations are beginning to recognize women’s contributions to science. It’s about time!”

— Adolph Teitelbaum, widower of pioneer programmer Ruth Teitelbaum

The ENIAC, first computer to use electronic tubes, was built at the University of Pennsylvania’s Moore School of Electrical Engineering between 1942 and 1945. The women accomplished extremely innovative and groundbreaking programming tasks with essentially no guidelines or guidance – however, they were rated by the Army as sub-professionals.

The ENIAC project was classified. Until they received their security clearance, they were denied access to the machine they were supposed to tame into usefulness – they had only logical diagrams to help them attack the problem.

The programmers had to reconfigure the ENIAC for each problem solved: reshuffle cables, restack bus trays, and reset the operation switches on each component. Therefore, the description for the first programming job might have read: “Requires physical effort, mental creativity, innovative spirit, and a high degree of patience.”

In 1947, the ENIAC was turned into a “stored program” computer – the first. Thus, this was the only generation of programmers to program it at the machine level.

Jean Bartik, one of the award recipients, commented on the honor: “What a wonderful pleasure for me to receive this award from fellow women in technology. After all these years, the ENIAC still seems like a miracle to me. Thank goodness I was in the right place at the right time to be one of the group that helped ENIAC begin the Computer Age.”

“I’m pleased that technology organizations are beginning to recognize women’s contributions to science,” commented Adolph Teitelbaum, widower of programmer Ruth Teitelbaum. “It’s about time!”

## **Other recipients are latter-day innovators**

The other women being honored by WITI as Hall of Fame honorees are also innovators in their own right. A description of the contributions each of these women has made to science and technology follows.

## **Hall of Fame award criteria**

Recipients the WITI Hall of Fame were judged among the candidates as best meeting one or more of these criteria:

- Directly made an exceptional contribution to the advancement of science or technology
- Created or facilitated programs that motivate young women to choose careers in science and technology
- Enabled and encouraged other scientific and technical women to advance in their careers
- Created scientific or technological innovations that promote environmental harmony, support humanitarian endeavors, or improve the human condition

## **Hall of Fame judges**

The distinguished panel of judges included Barbara Grant, 1996 WITI Hall of Fame inductee and vice president and general manager of the Removable Media Storage Solutions Business Unit in the IBM Storage Systems Division; Ellen Taylor, senior vice president and COO of Wright Strategies; and Chris Knoblauch, online products manager, *San Jose Mercury News*.

## **Additional Information about the WITI Hall of Fame Award Recipients**

### The ENIAC programmers

On February 14, 1946, the ENIAC Computer was unveiled to the public and press, and ran a ballistics trajectory programmed by Jean Bartik and Betty Holberton. Jean Bartik played a vital role in writing the programming instructions that converted the ENIAC into a stored program computer. Betty Holberton went on to design the control console for UNIVAC I and the UNIVAC instruction code. In addition, she was active on the early FORTRAN standards committee and wrote the FORTRAN test suites for the National Bureau of Standards. This was the first comprehensive, automated verification facility for the first programming language that was ever standardized.

All six women contributed to the programming of the ENIAC. Many of these pioneer programmers went on to develop innovative tools for future software engineers and to teach others early programming languages. They also worked tirelessly to make computers easier to use — Bartik's stored program concept is one example, and Holberton's work as chair of the committee that established standards for the Common Business Oriented Language (COBOL) is another.

## Fran Allen, IBM fellow

Fran Allen has made outstanding contributions to the field of programming languages for almost forty years, and her work has significantly influenced the wider computer science community.

Allen is regarded as a pioneer in the field of optimizing compilers. Her achievements include seminal work in compilers, code optimization, and parallelization. In the early 1980s, she formed the Parallel TRANslation (PTRAN) group to study the issues involved in compiling for parallel machines. The group was considered to be one of the top research groups in the world dealing with parallelization issues. Her work on these projects culminated in algorithms and technologies that are the basis for the theory of program optimization, and are widely used in today's commercial compilers throughout the industry.

Allen's influence on the IBM community was recognized by her appointment as an IBM fellow, the first woman to receive this recognition. Further, she was recognized by being elected president of the IBM Academy of Technology. The IBM Academy plays an important role in the corporation by providing technical leadership, advancing the understanding of key technical areas, and fostering communications among technical professionals.

"We need to spread the word and change the number of women in our field. Let's aim for '50-50 by 2020!'"

— Fran Allen, IBM fellow

Allen: "Being elected to the Women in Technology Hall of Fame is a great honor and means a lot to me personally. I wish I could find a way to thank all the people who have helped me during my career – 40 or so years long, now! A career in science or technology is fun and rewarding – I wish more women knew. We need to spread the word and change the number of women in our field. Let's aim for '50-50 by 2020!'"

"Fran Allen is truly one of the pioneers in the computer industry," said Paul Horn, IBM senior vice president and director of the research division. "We are delighted that she is being recognized by her peers throughout the industry. She is an excellent role model for young women wishing to excel in the computer industry."

## Carol Bartz, CEO of Autodesk

Only 2 percent of technology company chief executives are women. As CEO of Autodesk, Carol Bartz runs the fourth largest PC software company in the world, with 3 million customers in nearly 140 countries. She is also a strong role model for other aspiring women in the software industry. Bartz led the effort to re-architect Autodesk's flagship product AutoCAD, and continues to lead the corporation towards further innovation and diversification of its product line.

Bartz never hesitates to sponsor internal Autodesk organizations that support women, including the Women's Manager's Group at Autodesk and the Autodesk Foundation, which fosters programs in math and science from K-12 at local area schools.

Bartz both encourages and admonishes women and men to continue to work for progress: “Women need to jump out of their element, out of their comfort zone. And you have to ask the men, ‘what are you doing at your company now so that your daughter or granddaughter can be a vice president or CEO of it?’”

Bartz: “I never dreamed I’d be inducted into a Hall of Fame of any kind, but seeing women recognized for their contributions to science and technology warms my heart. I only hope that in the future what I have done will pale in comparison to the achievements of women in my daughter’s generation.”

“I only hope that in the future what I have done will pale in comparison to the achievements of women in my daughter’s generation.”

— Carol Bartz, CEO, Autodesk

### Pamela Meyer Lopker, founder and president of QAD

Pamela Lopker has made an exceptional contribution to the advancement of technology as the founder and president of QAD Inc., one of the world’s leading producers of Enterprise Resource Planning (ERP) software. QAD’s software enables manufacturing and distribution companies to track and control every aspect of their business.

Since founding QAD in 1979 at the age of 25, Lopker has been the company’s technology visionary. In that role, she has been the prime mover behind the recent implementation of object-oriented software technology in QAD’s flagship product, MFG/PRO. The continuous development of the MFG/PRO product has made it a major player in the open systems, ERP arena. Later this year QAD will extend the use of its object-oriented framework when it announces a new product family designed to support global supply chain management requirements.

In 1995 Lopker established QAD’s 2006 Project, which offers an introduction to the Internet to upper-grade students from all the elementary schools in the Santa Barbara South Coast area.

Lopker was named “Entrepreneur of the Year” for the greater Los Angeles area and is the richest self-made woman in the *Forbes* “Four Hundred.”

Lopker: “It’s a real honor to be named to the WITI Hall of Fame, and a privilege to be able to promote the advancement of women in our industry. In some other industries that have more traditional ways of operating it’s sometimes hard for a woman to make headway. High technology is fast moving and fast growing – nothing is set in concrete. That gives everyone – including, of course, women – a lot of opportunity. I’m delighted to be part of an effort that helps women to be more successful in their careers and make a greater contribution to the success of their companies.”

### Marcia Neugebauer, visiting distinguished scientist, Jet Propulsion Laboratory

Through her studies of the solar wind, Marcia Neugebauer has developed analytical techniques vital to understanding the nature of this flow of energetic particles from the sun and its impact on the earth. As we move into a decade of increased solar activity, the influence of the solar wind on orbital and terrestrial electronics and power systems will increase. In the future, as these communications systems become increasingly important



to businesses everywhere, understanding the solar wind will become vital to fine-tuning this technology.

Neugebauer is a leader in the heliospheric physics community. Besides contributing to the body of knowledge about the solar wind, she also applies her expertise to the study of comets and to the design and development of plasma instruments capable of measuring solar phenomenon in the solar system.

Neugebauer: "I feel very honored to have been selected for WITI's Hall of Fame. I look forward to the June conference and the opportunity to learn what's at the forefront in fields other than my own."

#### Donna Shirley, director of the Mars Exploration Program, Jet Propulsion Laboratory

Donna Shirley has been the driving force behind a cohesive, aggressive, low cost, and publicly accessible Mars Exploration Program, which is sending spacecraft to orbit, land, and rove on Mars. Beginning this year with the Mars Global Surveyor and Mars Pathfinder, the program will continue to fly two missions during each launch opportunity (which occurs every 26 months) through 2005, when the program plans to launch a mission to return a sample from Mars.

Shirley believes strongly in involving the public in the space program, and has been proactive in seeing to it that the results of space missions are understandable to average citizens.

Shirley is the most senior female technical manager at JPL.

Shirley: "I'm astonished, but very proud and pleased to be honored with an induction into the WITI Hall of Fame. Thanks, Joan Horvath, for nominating me. I attended the WITI conference last year and found it to be very interesting and useful. WITI is a great organization."

#### Shaunna Sowell, vice president and manager of Corporate Environmental, Texas Instruments

Shaunna Sowell's nomination form was accompanied by testimonials from 35 Texas Instruments employees – a tribute to the respect and admiration she engenders with her fellow TI employees. Sowell was a founding member of the first diversity initiative at TI. This initiative fostered the professional development of women and minorities, who have been underrepresented in technical fields in the past. She now leads a project to deploy a formal mentoring plan for Corporate Services team members.

Sowell is currently responsible for TI's worldwide design for environment, safety, and health programs. These initiatives have saved the company millions of dollars and enabled TI to return more than \$50 million worth of resources to a sustainable economy through various resource conservation programs such as non-hazardous solid waste recycling, chemical reduction and reuse, and energy conservation. The program has been recognized with 15 prestigious awards this year alone including awards from the U.S., Europe, and Asia.

In the course of her career, Sowell has also served as TI's first female wafer fab construction project manager and the first female wafer fab facilities operations manager. She was profiled in *Women's Engineering* magazine in 1992.

Among her many significant contributions, Sowell has developed a mentoring relationship with the principal at a local elementary school contributing business strategies to address challenges associated with managing a school. Additionally, through her leadership and nurturing of the JASON Project, the wonders of science and technology have been brought to hundreds of children who would never otherwise have had the exposure and the opportunity to learn.

Sowell: "I am extremely honored to be inducted into the WITI Hall of Fame, and I'm deeply grateful to my peers at TI who valued my contributions enough to nominate me. Because my accomplishments have resulted from my work with great organizations, this honor also recognizes the efforts of many TI employees with whom I have had the privilege to work."

**Patty Stonesifer, management advisor to DreamWorks and formerly senior vice president of Microsoft Corporation**

At Microsoft Patty Stonesifer was senior vice president of the Interactive Media Division, an \$800 million business and the largest multimedia company in the nation. She recently negotiated Microsoft's joint venture with DreamWorks SKG, a company owned by Steven Spielberg and Jeffrey Katzenberg. The venture brought together the worlds of computers, entertainment, and education, and helped in the creation of an era in which computers are becoming household necessities.

"We are a grassroots organization which has been lucky enough to have Patty [Stonesifer] as a role model these last few years, and wish to thank her by gaining her entrance into the WITI Hall of Fame."

— Microsoft Hoppers, in the Hall of Fame nomination form

Stonesifer was at Microsoft from 1988 through 1997, most recently leading Microsoft's Interactive Media Division, which is responsible for the creation and marketing of interactive entertainment, news, information, and service products across a variety of media, including the Internet. In addition to building the #1 CD-ROM-based consumer software business in the world, Stonesifer managed Microsoft's investments in new online content and service products. Key consumer titles include Microsoft Encarta Encyclopedia, Microsoft Magic School Bus Series, and Microsoft Flight Simulator.

In addition to involvement in a range of professional, community, and educational organizations, Stonesifer is a founding board member and executive committee member of the Academy of Interactive Arts and Sciences, a national academy formed in 1996 and dedicated to providing both educational and recognition opportunities for the creative members of the interactive media industry. She is also the founding co-chair of the CITIES board, an industry and academic board committed to expanding the use of technology in Seattle's community colleges.

Although Stonsifer traded in her position at Microsoft to be a management consultant to DreamWorks, "Hoppers," the women's diversity group at Microsoft, nominated her as their representative for the WITI Hall of Fame. The Hoppers stated in her nomination form: "We are a grassroots organization which has been lucky enough to have Patty as a role model these last few years, and wish to thank her by gaining her entrance into the WITI Hall of Fame."

Throughout Stonesifer's career she has taken time to publicly support initiatives on behalf of women and minorities. Many of the managers formerly reporting to Stonesifer at Microsoft have been successful in part through her guidance. In July 1996 Stonesifer was named as one of the 25 Most Influential People in America by *Time* magazine.

Microsoft Hoppers: "Patty is an inspiration to everyone she works with. Hoppers nominated her for the WITI Hall of Fame without her knowledge. It was our gift to her, a thank-you for all she's done for us, and we're delighted to see her get this well-deserved award."

Patricia Wallington, corporate vice president and chief information officer, The Document Company Xerox

Patricia Wallington was responsible for the 1994 Xerox Global Outsourcing contract for \$3.2 billion. Covering a ten-year period, it is the largest such contract to date and the first to be global in scope. In two years, Xerox completely transformed its information technology environment by entirely replacing a proprietary infrastructure with new industry standards, hardware, software and new work practices across 700 sites and 60,000 seats worldwide.

"I feel somewhat humbled and certainly honored to be selected for this award. It has a very special meaning to me because it comes from WITI where I think there is a great personal understanding of the challenges women face in making contributions."

-Patricia Wallington, corporate vice president and chief information officer, The Document Company Xerox

Wallington was honored with the prestigious "CIO of the Year" award in 1994. She was also named to the Top 100 Women in Computing that same year and has also been named among the Top 50 Technology Drivers. Wallington holds the honor of being the first female president for the Society for Information Management. She was a founding member of Women in Computing in her hometown of Philadelphia.

Within Xerox and in the private sector, Wallington has been a role model for other professional women. In 1995, two members of her staff received Top 100 Women in Computing Award.

When contacted concerning the WITI Hall of Fame award, Wallington responded, "I feel somewhat humbled and certainly honored to be selected for this award. It has a very special meaning to me because it comes from WITI where I think there is a great personal understanding of the challenges women face in making contributions."

Rosalyn S. Yalow, Nobel laureate

Rosalyn Yalow became the second woman and the first American-born and -educated woman to win a Nobel Prize in physiology or medicine. The award was made in 1977 for the discovery of radioimmunoassay (RIA), a technique that allows scientists to measure minute amounts of many different substances in the blood by tagging them with radioactive tracers. RIA's ability to measure tiny amounts of substances has made a difference in medical research comparable to the invention of the x-ray. RIA today is used to measure hormones, vitamins, enzymes, toxins, and other substances that prior to this invention were too small for physicians to detect.

About the paucity of women in science, Yalow has stated, "The world cannot afford the loss of the talents of half its people if we are to solve the many problems which beset us."



## Annotated Bibliography

### Introduction

This section contains short summaries of research projects conducted during the past several years that are related to the key topic of this paper, or to one or more of the survey, poll, or interview questions in Appendices A-C. Although most of these studies were done on a broader or somewhat different demographic group than the focus of this paper, there is some relevance in the findings and recommendations.

Notable about this compendium of research results is the paucity of either qualitative or quantitative studies on the subject of this paper: women's bottom-line business value. Studies emphasizing women's versus men's style (e.g., styles of management) or numerically-based data (e.g., number of women on corporate boards) are much more common. Rarely do studies focus, even peripherally, on the bottom-line benefit women bring to organizations and how to quantify that benefit.

For the past several years WITI has taken these steps to research and recognize women's and organizations' accomplishments:

- WITI sponsors an annual Hall of Fame banquet at its annual conference.
- WITI profiles women in science and technology during the month of June each year.
- WITI jointly sponsors (along with the *San Jose Mercury News*) an annual CEO recognition event honoring CEOs who have demonstrated leadership in promoting workforce diversity.

WITI believes, however, that more is required, and hopes that other organizations will support and/or join in doing additional research, suggesting useful metrics to measure success, and recognizing success.

### Contents of this Section

#### **Salary Surveys (page 63)**

- Microsoft Certified Trainers
- *Working Woman* Annual Salary Report

#### **Additional Research on Workplace Barriers (page 61)**

#### **Independent Women's Forum Challenges Stereotypes about Workplace Discrimination (page 67)**

#### **Research on Value and the Recognition of Value (page 67)**

- Women in business still ignored by media
- Women feel their value to the organizations they work for is not always recognized

***The Equity Equation: Fostering the Advancement of Women in the Sciences, Mathematics, and Engineering (page 69)***

- Policies to promote women in science
- Myths and realities of women's progress in the sciences, mathematics, and engineering
- Women, academia, and careers in science
- Women scientists in industry
- Ensuring educational and career equity for women: a research and policy agenda

**Research on Women Executives and Board Members (page 74)**

- What are key obstacles for women executives? (Comparison of responses of women executives – VP level and above – and male CEOs)
- Top corporate leadership still eludes women
- In 1996 women broke the 10 percent barrier of total board seats on Fortune 500 companies (But none of the Fortune 500 companies with HQs in Silicon Valley have more than one female board member)
- More CEOs want female directors

**Research on Women's and Men's Management Styles (page 74)**

- Women and men business owners have different thinking and management styles
- In management assessments, women outscored men when rated by employees, bosses, and themselves. (What if women really are better managers, and putting them in positions of leadership is less risky than putting men in these roles?)
- "Aggressive" behavior is highly valued in high-technology women managers

**Research on Women Business Owners and Women as Purchasers of Technology (page 80)**

- IntelliQuest CIMS and InternetTrak data
- Why women leave corporations to become entrepreneurs
- Women expanding as business owners
- Women-owned businesses outpace all U.S. firms (But they have difficulty getting business financing)
- Women-owned firms participating in the global marketplace are growing more rapidly than women-owned businesses which are primarily domestic (But capital is still difficult for women to come by)

- Technology is the key to growth and success of women-owned businesses (Three quarters of survey respondents say technology is “very essential” to their business operations and over half plan to increase their information technology investment in the coming year)
- Women and men entrepreneurs differ on technology purchase decisions (Women are more heavily focused on service, price, and the vendor’s reputation and experience)
- Women-owned firms will make approximately \$50 billion in computer-related purchases this year
- Forty-two percent of online users are now women (Up from 34% 18 months ago)

***Who Succeeds in Science? The Gender Dimension (page 87)***

**Salary Surveys**

“People in the high-tech sector bang their heads against each other trying to hire enough people.”

— Marc Andreessen, co-founder of Netscape (quoted 1997 in the *San Jose Mercury News*)

**Microsoft Certified Trainers**

Microsoft Certified Trainers (MCTs) are defined by Microsoft as qualified instructionally and certified technically by Microsoft to deliver Microsoft Official Curriculum instructor-led courses to computer professionals. A Microsoft training program requires instructors to take the course they are applying to teach, as well as complete special instruction in training skills.

MCTs hold at least a Microsoft Certified Product Specialist title; some hold either MCSEs or MCSDs, as well.

There are approximately 6,500 MCTs worldwide.

This survey was published in the January/February 1997 issue of *Microsoft Certified Professional Magazine* (www.mcpmag.com). Salaries by gender are shown in Table 9.

<b>Gender</b>	<b>Total (x \$1000)</b>	<b>West</b>	<b>West/ Midwest</b>	<b>South/ Midwest</b>	<b>Mid- Atlantic</b>	<b>North- East</b>
Male	\$69.5	\$75.4	\$82.2	\$67.9	\$60.3	\$92.2
Female	\$54.3	\$62.0	Insufficient data	\$49.0	\$57.0	\$67.3

• Table 9: Salaries of Microsoft Certified Trainers



## Working Woman Annual Salary Survey

The information in Table 10 was published in the January 1997 of *Working Woman*.

Category	Title or Years of Experience	Women	Men	Overall
Computers	Computer Systems Analyst/Scientist	\$40,716	\$47,320	\$45,344
	Mathematical/Computer Scientist	\$39,208	\$46,540	\$44,408
	Operations Systems Researcher/Analyst	\$36,296	\$41,548	\$39,468
	Operations Systems Computer Operator	\$20,384	\$27,404	\$22,776
Engineering	10-14 years of experience	\$64,108	\$63,520	\$64,000
	7-9 years	\$49,560	\$56,000	\$55,000
	5-6 years	\$49,100	\$50,000	\$50,000
	3-4 years	\$44,000	\$45,577	\$45,000
Human Resources	Personnel, Training and Labor Relations Specialist	\$30,212	\$35,932	\$31,720
Marketing	VP, Marketing	\$129,000	\$127,000	\$127,000
	VP, Product Management	\$98,000	\$122,000	\$117,000
	VP, Advertising	\$81,000	\$107,000	\$100,000
	VP, Brand Management	\$83,000	\$85,000	\$84,000

• Table 10: Working Woman Annual Salary Survey

### Additional Research on Workplace Barriers

Research monograph: "Barriers to Work Place Advancement: The Experience of the White Female Work Force" by:

Bette Woody, Ph.D.  
 Carol Weiss, Ed.D.  
 William Monroe Trotter Institute  
 University of Massachusetts  
 Boston, Massachusetts 02125  
 Submitted to the U.S. Department of Labor Glass Ceiling Commission  
 April 19, 1994

Summary of findings and recommendations:

- **Lack of CEO commitment is the principal barrier in women reaching the top of corporate hierarchies.**

CEO failures include: lack of goals setting and communication of commitments; failure to hold subordinates accountable for nominating and developing talented women and personal failure to assign women to high visibility task forces, crisis and problem solving jobs — the primary routes to the top.

- **Negative and indifferent behavior of senior managers and use of promotion systems are key behavioral and structural barriers to the general advancement of white female managers.**

Behavior of superiors through performance appraisal, job assignments and recommendations for promotion, are key barriers to advancement of white women managers and professionals into mid-management and into upper levels.

- **Structural barriers are mainly functional job assignments and promotion processes.**

White women face barriers in traditional corporate functional organization and job groups which incorporate internal progressions upward; such systems are frequently sex-typed, hostile to female managers and obsolescent in responding to new management styles such as teamwork and more flexible work organization and family responsibilities; recent structural change rather than removing barriers actually reinforces many negative features of job systems.

- **Senior women who reach the top, attribute achievements principally to individual effort and limited support of mentors, CEOs, and family.**

Contrary to myth, characteristics and attitudes of high achieving women are that they are well educated, highly committed individuals, with high satisfaction in work achievements, and success in managing personal and professional lives. Most have achieved through visibility in an industry rather than a single company; and with lateral movements as well as vertical ones.

- **Integration of managerial and professional employment and corporate hierarchies have yet to receive attention of policy makers, particularly in the executive branch.**

Equal employment opportunity's principal influence on mobility of white women has been both direct in opening managerial and professional education programs and indirect in negotiated court settlements in sex discrimination cases usually affecting lower status employees.

- **The closing of the education and work experience gap with men by white women, has not translated into higher status, high paid jobs.**

Dramatic narrowing of human capital differences between men and women in education and in specialized and diversified occupation and career experiences have not resulted in more access to top jobs in business and the professions, nor in closing the male-female gap in compensation as demonstrated in studies of elite MBA programs.

## **Independent Women's Forum Challenges Stereotypes**

Reported in the *Wall Street Journal*, January 15, 1997.

"The gap between women's and men's wages has narrowed from 59 cents in the 1960s to 76.4 percent today."

— "Women's Figures," published by the Independent Women's Forum and the American Enterprise Institute

"Women's Figures" is a new survey of economic data published by the Independent Women's Forum, a free-market nonprofit in Washington, and by the American Enterprise Institute.

"American women enjoy the best and most rewarding job market in the world," says the AEI's Diana Furchtgott-Roth, co-author of the report. "Why can't we acknowledge that some of the old stereotypes need questioning?"

Information from the report:

- The gap between women's and men's wages has narrowed from 59 cents in the 1960s to 76.4 percent today.
- The authors take issue with the methodology of the 1995 Glass Ceiling Commission Report. That report reported that only 5% of senior managers at Fortune 2000 industrial and service companies are women. The authors of "Women's Figures" note that, typically, senior positions in corporations are held by people with MBAs and 25 years' experience. But the Commission compared men in that group to women across the overall work force. Given that far fewer women than men took MBAs 25 years ago, it would be wrong to expect 50% of the CEO force to be women now.
- Women haven't made it to the top in some professions simply because they haven't been in the pipeline long enough. A study by Korn/Ferry, an executive search firm found that in the past 10 years female executive vice presidents doubled and the number of female senior vice presidents increased 75%. Since 1982, women have earned more bachelor's and master's degrees each year than men. The percentage of doctoral degrees awarded to women has risen from 10 percent in 1960 to 40 percent in 1992. Women are earning more than 40 percent of degrees in law and 35 percent of degrees in dentistry and medicine.
- Women are starting businesses at twice the rate of men.

## **Research on Value and the Recognition of Value**

### **Women in business still ignored by media**

Observations expressed at a 1996 conference, "Women, Business and the Media" by:

Catalyst (also International Women's Media Foundation and Freedom Forum Media Studies Center)  
250 Park Avenue South  
New York, NY 10003-1459  
212-777-8900

“Even as women become a critical mass inside newspapers and networks and you’d expect female sources to increase, they are not,” said Linda Wertheimer of National Public Radio. (A 1996 study conducted by the Freedom Forum Media Studies Center found that women were quoted or referenced in only 13 to 14 percent of business-related stories.)

“Even as women become a critical mass inside newspaper and networks and you’d expect female sources to increase, they are not.”

—Linda Wertheimer, National Public Radio

The problem, according to Catalyst President Sheila Wellington, is “three-pronged: women don’t come forward, companies don’t put them forward, and the press use women primarily for ‘women’s stories’ — such as those on work-family balance issues — rather than for business stories.”

Media references are important, according to Catalyst, because the visibility and credibility of businesswomen is important to advancement. Men know this, but women don’t include the media in their own advancement strategies.

The Catalyst panel of experts recommended the following.

For corporate women:

- Consider media visibility as part of your advancement strategy.
- Manage your communications relationships inside and outside the corporation. Tell corporate communications how you want to be seen; ask to make speeches and be on panels.
- Cultivate reporters. Remember that there is mutuality of interest.
- Get training and become comfortable with the media.
- Take responsibility. Be clear about ground rules. Talk on the record. Contact reporters in your areas of expertise. Follow up.
- Consider a failure or problem with the media as experience. Take risk.

For corporate communications groups:

- Position women as business experts, not merely as sources for “women’s stories.”
- Create a policy of including women on lists of business experts.
- Offer training and external exposure.

## **Women feel their value is not always recognized**

Survey entitled:

Working Women Count! A Report to the Nation  
Women's Bureau, U.S. Department of Labor  
200 Constitution Avenue, NW  
Washington, DC 20210

The "Working Women Count!" report was published in 1994. The Women's Bureau enlisted more than 1,600 partners to help distribute the questionnaire. The partners include more than 300 businesses, 900 grassroots organizations, 75 unions, daily newspapers, national magazines and Federal agencies – in all 50 states, the Virgin Islands, Guam and Puerto Rico. In addition to the questionnaire, the Women's Bureau conducted a telephone survey with a scientifically selected, national random sample.

Key findings included:

Opportunity should reflect the value of women's work. Women believe they have valuable skills and on-the-job experience, but often do not get recognition and credit for what they can do – nor access to training to build their skills and increase their marketability.

## ***The Equity Equation***

Cross University Research in Engineering and Science (CURIES) is a working group on research and praxis concerning women and gender in science, engineering, and mathematics. *The Equity Equation* resulted from the 1994 CURIES conference. The book was edited by:

- Cinda-Sue Davis, University of Michigan Women in Science and Engineering Program
- Angela B. Ginorio, director of the Northwest Center for Research of Women
- Carol S. Hollenshead, director of the University of Michigan Center for the Education of Women
- Barbara B. Lazarus, associate provost for academic projects at Carnegie Mellon University
- Paula M. Rayman, director of the Public Policy Institute at Radcliffe College and instructor in the Harvard Graduate School of Education

*The Equity Equation: Fostering the Advancement of Women in the Sciences, Mathematics, and Engineering* was published by Jossey-Bass Publishers, San Francisco, in 1996.

## **Policies to promote women in science**

Daryl Chubin is division director for research, evaluation, and dissemination in the Education and Human Resources Directorate of the National Science Foundation.

Shirley Malcom is head of the Directorate for Education and Human Resources Programs of the American Association for the Advancement of Science (AAAS). She is also on the National Science Board and has been named to the President's Committee of Advisors on Science and Technology.

Chubin and Malcom analyze the critical role of public policy in education and in the support of scientific research. They argue for reinventing science to take advantage of our nation's full human resources, and they conclude that it is a national imperative to ensure equal opportunity in the scientific enterprise.

"If the culture of a workplace is unwelcoming, even the best human resources will not be drawn to it."

— Chubin and Malcolm in *The Equity Equation*

#### Highlights:

- Public policy is a blunt instrument. It seeks to transform institutions from the inside out, but usually intervenes on behalf of outsiders trying to get in. The difference is not subtle: the latter kind of public policy is a wedge that lets people seep into essentially unchanged institutions; the former is a mandate that declares how institutions shall act and urges them, along with culture at large, to accept change. In fact, both individuals and institutions must be readied for change. The dual burden of public policy is to force an examination of individual behavior and, in the process, to change institutions to accommodate the intent of policy . . . Put another way, if the culture of a workplace is unwelcoming, even the best human resources will not be drawn to it.
- There is too much focus on increasing women's participation in the science and engineering pipeline, and too little on creating an environment where women and people of color can find appropriate jobs in academic and industrial science.
- Women earn less at every stage of the scientific career, and the disparity increases at the highest levels of experience.
- There should be a change in the reward system in research universities and other institutions that claim to value teaching while penalizing those who spend time trying to teach well.
- We need to rethink the ground rules of science belonging to a bygone era, when "men were men, scientists were men, and science was all about the mastery of nature, control of the universe, and variants on the themes of domination, exclusivity, and presupposition, instead of harmony, inclusivity, and participation."
- There is a need to reinvent science to develop human resources to make the human infrastructure more than an afterthought.

#### **Myths and realities of women's progress in the sciences, mathematics, and engineering**

The late Betty Vetter served as a director of the Commission on Professionals in Science and Technology from 1963 to 1994. In this capacity she planned and administered a

program concerned broadly with providing accurate information about the characteristics of and opportunities for U.S. scientists and engineers, with fostering excellence in their education, and with their utilization in the national interest.

Tracing progress in the last two decades, Vetter concludes that the increases in women's participation in science seen in the 1970s and early 1980s have leveled off in most areas. She documents lower salaries, higher unemployment rates, and slower progress toward advancement or tenure for women.

Highlights:

- There is no evidence that girls are born less inclined to mathematics or mechanics than boys, but there is strong evidence that society believes this to be the case and encourages a division between boys and girls. Classroom attitudes of teachers, books written for children, and subtle but constant parental and societal pressures persuade children that boys are better at science, engineering, and mathematics than are girls and that girls are better with words than are boys.

“There is no evidence that girls are born less inclined to mathematics or mechanics than boys, but there is strong evidence that society believes this to be the case and encourages a division between boys and girls.”

— Betty Vetter in *The Equity Equation*

- Mathematics is the single most important factor in determining admission and success in science and engineering careers, and girls score as well as boys through the early teens. However, with little to encourage their participation, many girls drop out of mathematics as soon as they can, and this lowers their scores by age seventeen (1988 data). In the 1990 National Assessment of Educational Progress (NAEP), young women showed some improvement relative to the men in their age group, as mathematics course taking for girls again came into favor. . . Science is a different matter. The NAEP science assessment shows a sex gap even at age nine.
- By the tenth grade, only 10 percent of girls, compared with 25 percent of boys, express interest in the natural sciences. By the end of high school, only 5 percent of the girls indicate a potential career interest in these fields, while about 20 percent of the boys still do so (1990 data).
- For the female graduating class, the proportion of NS/E bachelor's degrees has fallen from 12.3 percent in 1986 to 9.1 percent in 1991, while the percentage in social and behavioral sciences has risen steadily.
- It appears that women achieve near pay equity in some occupations as a correlate of the amount of mathematics they studied in college. If one looks only at those who earned more than eight credits in college-level mathematics, gender-based salary differentials drop from 9.1 percent to 2.6 percent among accountants and from 5 percent to 1.9 percent among engineers.
- A recent report (1990) says that 66 percent of leader-style women in corporate line or staff positions perceive hostility from their superiors, while only 2 percent of the leader-style men perceive any hostility to women in the workplace.

- A survey of engineers (1991) asked explicitly if they were “personally aware of instances where females have been overlooked with regard to career opportunities.” Among the women, 56 percent said yes, compared to 15 percent of the men.
- Among doctoral scientists and engineers employed in academic institutions, women were 20.5 percent of the 1991 total. However, they still earn less than men at every rank, in every type of institution, and in every field. It is also more difficult for women than for men to find permanent academic employment, to achieve tenure, and to advance in rank.

**Women, academia, and careers in science and engineering**

Mary Frank Fox is professor of sociology, School of History, Technology, and Society, George Institute of Technology. She is associate editor of *Sex Roles* and co-founder and past associate editor of *Gender & Society*.

In this chapter, Mary Frank Fox finds that “the higher the fewer” still holds true for women in the ranks of academic faculty. She examines the institutional factors that contribute to this phenomenon, the implications for policy, and the future prospects for women’s attainment in academic science and engineering.

The percentage of female doctoral scientists and engineers employed in four-year colleges and universities (1991), is shown in Table 11.

Field	Percentage female
Physical scientists	7.8
Mathematical scientists	8.6
Computer specialists	13.3
Environmental scientists	11.7
Life scientists	26.2
Psychologists	35.8
Social scientists	23.4
Engineers	4.1
<b>Total employed</b>	<b>19.7</b>

• Table 11: Scientists and engineers employed in four-year colleges and universities

Some highlights:

- Across SME (science, mathematics, engineering) fields, the higher the rank, the lower the proportion of women. As of 1991, women were 29 percent of the assistant



professors, 21 percent of the associate professors, and 9 percent of the full professors in the SME fields.

- The highest percentage of women scientists at the full professor level is in psychology (20.5 percent). The lowest is physical scientists (2.9 percent) and engineers (1.0 percent).
- Although women's attainments in science are lower than men's their measured ability (IQ) is higher. Data on IQ may not be adequate indicators of intelligence or ability, but to the extent that they capture differences, they indicate that, if anything, women in science are a more select intellectual group than men.
- One might ask, are women and men in science receiving degrees from different types of institutions? Are women's degrees incomparable to men's and from lower-ranking institutions? With some variation by discipline, women and men are about as apt to have degrees from top-ranking institutions.
- Are women scientists constrained geographically in their jobs and job mobility, since many of them are married to other professionals and therefore have to take into account their husbands' as well as their own jobs? Does marriage affect their status in science? [A study cited by Fox] did not find that geographic constraints affected women's academic rank; they found no connection between location and academic rank for women.
- At professional meetings, women biologists contribute presentations in about the same proportion in which they are represented in the membership of the associations. However, as prestigious invited speakers, women are often underrepresented. At the large meetings of the American Institute of Biological Sciences in 1989, none of the symposia organizers and only 6 percent of the invited speakers were women. In contrast, half the speakers in the category of contributed papers were women.

"At professional meetings, women biologists contribute presentations in about the same proportion in which they are represented in the membership of the associations. However, as prestigious invited speakers, women are often underrepresented."

— Mary Frank Fox in *The Equity Equation*

### **Women scientists in industry**

Paula M. Rayman is director of the Public Policy Institute at Radcliffe College and an instructor at the Harvard Graduate School of Education. She holds joint doctorates in economics and sociology from Boston College.

Jennifer S. Jackson is a senior research analyst for the Center for Educational Leadership and Technology in Marlborough, Massachusetts. She received her B.A. in psychology from Wellesley College and her M.Ed. from the Harvard Graduate School of Education.

This chapter explores the status of women in nonacademic careers.

Some highlights:

- In 1991, women made up 18.8 percent of all employed doctoral scientists and engineers as defined by the Commission on Professionals in Science and Technology. The definition includes computer scientists, life scientists, physical scientists, mathematicians, computer specialists, psychologists, social scientists, and all engineers.
- Women with Ph.D.'s comprised only 15.2 percent of all those employed in business and industry compared to 20.5 percent of those in education. At lower degree levels, more women work in industry, but they continue to enter at slower rates than men.
- Women scientists and engineers earn only about 75 percent as much as men. The discrepancy is smaller for master's recipients (84 percent) and Ph.D.'s with one year or less of experience (88 percent).
- Female scientists are more likely than male scientists to move to a new location to satisfy a spouse's career.
- Women comprise 29.6 percent of systems analysts / computer scientists and 33.3 percent of all programmers.

"Women scientists and engineers earn only about 75 percent as much as men. The discrepancy is smaller for master's recipients (84 percent) and Ph.D.'s with one year or less of experience (88 percent)."

— Rayman and Jackson in *The Equity Equation*

## Research on Women Executives and Board Members

### What are key obstacles for women executives?

Research done by:

Catalyst  
250 Park Avenue South  
New York, NY 10003-1459  
212-777-8900

Catalyst surveyed 1251 women at the VP level and above in Fortune 1000 companies about their career experiences; 37 percent responded. The report compares the responses of the female executives with those of Fortune 1000 CEOs. The CEO survey received 325 responses (33 percent).

Characteristics of women responding:

- Average income is \$248,000
- 81 percent fall within two reporting levels of the CEO and 44 percent are either one level away or report directly to the CEO
- Average age is 45
- Almost two-thirds have post-graduate degrees

- 72 percent are married
- 64 percent have children with two-thirds raising children under 18
- 92 percent are Caucasian

The report cited a strong difference of opinion on the key obstacles that hold women back in corporate America:

- Number 1 for women: Male stereotyping and preconceptions of women
  - Women: 52 percent
  - Male CEOs: 25 percent
- Number 2 for women: Exclusion from informal networks of communication
  - Women: 49 percent
  - Male CEOs: 15 percent
- Number 3 for women and number 1 for male CEOs: Lack of management / line experience (“not in the pipeline long enough”)

The report suggested the following actions.

Companies should:

- Demonstrate top-level commitment to lifting barriers impeding women’s advancement
- Take risks on high-potential women
- Ensure that women rotate into operational and line management positions
- Help employees balance work and personal or family responsibilities

Female executives should:

- Seek to understand the corporate culture and what is valued
- Be willing to make the trade-offs required for executive success
- Support other women, through women’s networks and/or informal mentoring

## **Top corporate leadership still eludes women**

1996 Catalyst Census of Women Corporate Officers (October 1996):

Catalyst  
250 Park Avenue South  
New York, NY 10003-1459  
212-777-8900

The study surveyed the Fortune 500 companies and reported findings for the year 1995.

Statistics reported in the study:

- Only 2.4 percent of people holding the titles of chairman, vice chairman, CEO, president, COO, and EVP were women.
- Only 10% of Fortune 500 corporate officers were women
- Only 1.9% were among the most highly compensated officers
- Only 5% had women filling at least one quarter of their officer positions
- 78% had at least one woman corporate officer

## **In 1996 women broke the 10 percent barrier of total board seats on Fortune 500**

Research conducted by:

Catalyst  
250 Park Avenue South  
New York, NY 10003-1459  
212-777-8900

The number of women holding board seats in 1996 was 10.2 percent, up from 9.5 percent in 1995, 8.7 percent in 1994, and 8.3 percent in 1993.

There is a statistically significant correlation between the number of women officers and top-level managers in a corporation and the number of women on that corporation's board.

Women represent less than 1 percent of inside directors on the boards of Fortune 500 companies.

Eighty-three percent had one or more women directors, up from 69 percent, the year Catalyst began publishing its census.

Of the top 100 companies of the Fortune 500 by revenue, 97 percent have at least one woman on their boards. The top 100 are more than twice as likely to have multiple women directors as the bottom 100.

Women of color represent 12.6 percent of women board directors, holding 1.4 percent of total board seats.

Tests of statistical significance demonstrate that companies mindful of women’s talent are tapping that talent for a variety of leadership roles. These positive correlations suggest a synergy between the presence of women board directors and the number of women corporate officers and women with the highest titles in the company.

Companies with three or more women directors are four times more likely to have top women corporate officers than those companies with just one woman director. In companies where no women sit on the board of directors, no women hold these titles.

Women occupy 55 of the 614 board of director seats of Fortune 500 companies based in California. Table 12 shows the number of female directors for Fortune 500 companies based in the Silicon Valley.

Company	Female Directors	Board Total
Advanced Micro Devices Inc.	0	8
Apple Computer Inc.	1	7
Applied Materials Inc.	0	10
Consolidated Freightways Inc.	1	12
Hewlett-Packard Co.	1	14
Intel Corp.	1	11
Oracle Corp.	0	8
Quantum Corp.	0	6
Seagate Technology Inc.	1	7
Sun Microsystems Inc.	1	7

• Table 12: Female directors, Fortune 500 companies with headquarters in the Silicon Valley

### **More CEOs want female directors**

Research conducted by:

Catalyst  
 250 Park Avenue South  
 New York, NY 10003-1459  
 212-777-8900

Reported in April 1995. There were 325 CEO respondents from the Fortune 500/Service 500 companies and follow-up interviews with 22 of America’s chief executives. The study was sponsored by Avon Products.

CEOs interviewed by Catalyst stressed the business case for increasing female representation on corporate boards:

- Women bring strategic input to their boards and generate productive discourse
- Different genders and races bring vital, diverse perspectives
- Half the workforce is female, half of college graduates are female, and women make nearly half of MBA graduates – in other words, half the talent pool
- The presence of female directors sends a positive message to shareholders, investors, employees, and the public
- The presence of female directors raises female employee morale

“Women bring new perspectives to the board table, which can be invaluable. All boards should reflect the diversity of the marketplace. Without women, you’re not getting the input representing 50 percent of the population, or in many cases, 80 percent of the buying population.”

— James Preston, chairman and CEO of Avon Products

## **Studies on Women’s and Men’s Management Styles**

### **Women and men business owners have different thinking and management styles**

Study by:

National Foundation for Women Business Owners (underwritten by American Express Small Business Services)

Entrepreneurs as a group share special characteristics unique to business owners which sets them apart from the general working population. However, men and women entrepreneurs also have management styles that set them apart from one another.

Among the findings:

- More than half of women business owners (53%) emphasize intuitive or “right-brain” thinking. This style stresses creativity, sensitivity and values-based decision making. Seven out of ten (71%) men business owners emphasize logical or “left-brain” thinking. This style stresses analysis, processing information methodically and developing procedures.
- Women business owner’s decision-making style is more “whole-brained” than their male counterparts, that is, more evenly distributed between right and left brain thinking.
- Two-thirds (66%) of women business owners (compared to 56% of men business owners) tend to reflect on decisions options and outcomes before moving to action. In addition, women are more likely to gather information from business advisors and associates. More men business owners (44% compared to 34% of women business owners) emphasize action and give greater attention to external events and activities than reflection.

“Up to now, models for business success have been largely male-defined, often forcing women into a mold in which they did not feel comfortable. The recognition that both women and men’s styles are styles of success will help them both strengthen their management styles and learn from each other.”

— Laura Henderson, Chair of the National Foundation for Women Business Owners and President and CEO of Prospect Associates, Rockville, Maryland

### **In management assessments, women outscored men**

Research conducted by:

Lawrence Pfaff and Associates, a human resources consulting firm  
Cited in *Chances and Choices: How Women Can Succeed in Today’s Knowledge-based Business*, by Janet C. Wylie

In the study subordinates rated the women higher than men in 20 of 20 categories, bosses rated them higher in 19 of 20 (15 of them were statistically significant), and women rated themselves higher in 15 of 20 categories.

Some of the biggest gaps were in evaluating the performance of employees, where women scored a 63 versus men’s 53; planning, where women averaged a 55 versus a 48 for their male counterparts; facilitating change, 58 for women versus a 46 for men; communication, where women scored a 59 and men averaged 50; and decisiveness, where women averaged a score of 50 against the men’s 44. Empowering employees and trust were two other areas where women averaged 10 points higher than men.

Janet Wylie had these thoughts on the meaning of the data:

“These data could be interpreted in one of two ways. One could surmise that in the categories assessed, or even in general, women really are better managers than men. If this were true, it would truly be groundbreaking, as many organizational cultures still support the notion that putting women in positions of power or leadership is inherently “risky.” What if, in fact, putting women in these roles is actually less risky than putting men in them?

“On the other hand, one could speculate that because of the barriers our corporate cultures create for women who try to reach the top, only the very excellent squeak by and become managers or leaders. If you subscribe to this idea, then one would expect these “superwomen” to shine compared to the average male who was relatively unhindered in his path up the ladder and was able to reach the same level by being mediocre or average instead of excellent.”

### **“Aggressive” behavior is highly valued in high-technology women managers**

Study entitled:

“The Effect of Psychological Gender on Perceived Managerial Potential of Aggressively Communicating Males and Females”  
Dr. Claire Brown  
University of Denver

As more and more women enter managerial ranks, especially in male dominated fields, a question arises regarding the perception of characteristics describing successful males and successful females. Past studies have indicated that individuals use different adjectives to describe males and females. The adjective “aggressive” is often used in a positive sense to describe males and successful managers; however, “aggressive” often takes on a negative connotation when describing females in the workplace. This research attempted to clarify the value of “aggressiveness” for males and females in the workplace.

Several companies participated in the research; they represented four types of businesses: high technology, services, healthcare, and utilities.

Results:

- High-technology supervisors rated the female aggressive communicators the highest overall in terms of managerial potential; they also rated male aggressive communicators the lowest in comparison to other company supervisors
- High-technology and healthcare supervisors rated the female aggressive communicator higher in terms of managerial potential than they rated the male aggressive communicator
- Utilities and services supervisors rated the male aggressive communicator higher in terms of managerial potential than they rated the female aggressive communicator

## **Research on Women Business Owners and Women as Purchasers of Technology**

### **IntelliQuest (IQ) CIMS and InternetTrak data (from Ziff-Davis Research)**

The InternetTrack data is based on the U.S. population and the IQ CIMS data is based on business influencers. The data focusing on the narrower target, business influencers, shows a higher level of female purchasers.

#### InternetTrak data

InternetTrak shows that 26% of females that are involved in their organization’s web-related activities (web influencers) select or specify brands for web-related products.

#### IQ SIMS data

The Computer Industry Media Study is conducted annually by IntelliQuest Inc., a research company specializing in the high-tech area.

The study is a syndicated study, conducted by an independent, third-party research company. Publishers, advertisers, and ad agencies subscribe to the study on an annual basis, giving them the rights to use the data.

The CIMS 3 study was conducted in February-June 1996 and the data were released in September 1996. The data discussed below are from the CIMS 3 study. This year’s study, CIMS 4, is currently in the field.

CIMS is a comprehensive study of the computer category. A total of 10,000 business influencers are surveyed about their publication readership, computer and related product



usage, and purchases and demographics. The sample is selected in such a way that the data are projectable to the total universe of business influencers, which is estimated to be 23.6 million. The sample is screened by telephone and the actual survey is completed on disk.

### IQ SIMS Findings

- 39% of business influencers, defined as those who are involved in the purchase of computers and related products for their organizations, are women. This is a universe of 9.2 million female business influencers.
- The following data all refer to female business influencers:
  - Median age 40
  - 53% are college graduates or more
  - 27% rate themselves as advanced/expert computer users
  - 36% hold management level positions
  - 13% are in top management
  - The majority (56%) have one of these three job functions:
    - Administrative/general management (26%)
    - Accounting/finance (15%)
    - Education/training (15%)
  - 90% are involved in the purchase of computers and related products:
    - Computer software (78%)
    - Computer systems (71%)
    - Printers/plotters (71%)
  - The majority are also involved in terms of providing advice on computers and related products:
    - Computer software (70%)
    - Computer systems (66%)
    - Printers/plotters (62%)
  - 53% have access to the Internet
  - 55% of female business influencers who are involved in designing/maintaining their organization's web site are involved in buying or plan to buy online or web-related products.

## **Why women leave corporations to become entrepreneurs**

Article entitled:

"Building a Better Ladder: Why Many Women Leave Corporate America for Success in Small Business" by Susan Phillips Bari, published in *Women Today*, Montgomery County, Maryland  
Reprinted on the Women's Connection Online webpage: [www.womenconnect.com](http://www.womenconnect.com)

Susan Phillips Bari is the executive director of the American Woman's Economic Development Corporation's Washington Regional Center. Founded in 1976, AWED is a non-profit organization that provides startup and management courses as well as other training, counseling, and technical assistance to entrepreneurial women.

According to the Small Business Administration's 1992 report entitled "The State of Small Business: A Report to the President," women are going into business at more than twice the rate of men and now own more than one third of the nation's small businesses.

According to Susan Bari, these are key reasons why women leave corporations:

- Some are tired of promises of advancement that have been side-railed by the glass ceiling and other factors
- Many are tired of inflexible hours which make dealing with growing children and suddenly needy parents a stressful and guild-ridden nightmare
- Some want to leave something behind for their own children
- Still others are driven to satisfy an unmet need in the marketplace by providing a product or service to fill a specific niche

## **Women expanding as business owners**

Associated Press story reported in the *San Jose Mercury News*, April 9, 1997.

Some 18.5 percent of businesses with employees that were started between 1991 and 1994 were owned by women, the Census Bureau reported on April 8, 1997. That's up from 12 percent of companies in existence by 1980.

The businesses owned by women are smaller than businesses in general, with 78.5 percent having between one and nine employees. For all businesses, 68.2 percent fall into that size category, the bureau said.

But the women are just as eager to expand as male business owners:

- 30.4 percent of the female-owned firms said they planned to increase their work force in the next five years
- 28.6 percent expect to add new products
- 7.7 percent plan to increase the number of locations
- 6.4 percent expect to expand government contracting
- 4.2 percent intend to expand into international markets

Other findings:

- Of the roughly 4.8 million employer businesses in the United States, 15.9 percent were owned by women. Women shared ownership of an additional 18.7 percent of businesses with men.
- The survey showed no statistically significant difference between male and female business owners in their access to credit. Only 12.8 percent of female-owned firms said their ability to operate or expand had been hampered by credit difficulty, compared with 11.5 percent for male-owned firms and 12 percent for all firms.
- Sources of credit for female-owned businesses also were similar to those for all firms. To finance planned expansion, 65.5 percent of the female-owned firms planned to reinvest profits, 39 percent planned to invest their own assets, 37 percent to obtain bank loans and 26 percent to use supplier credit. Other credit sources mentioned were business credit cards (18.5 percent) and government-guaranteed loans (11.9 percent).

### **Women-owned businesses outpace all U.S. firms**

Study by:

National Foundation for Women Business Owners (NFWBO) and Dun & Bradstreet Information Services

NFWBO is a non-profit research and leadership development foundation established by the National Association of Women Business Owners. NFWBO's mission is to support the growth of women business owners and their organizations through the gathering and sharing of knowledge.

Dun & Bradstreet Information Services, North America, is a company of The Dun & Bradstreet Corporation, a leading marketer of information, software and services for business decision making.

The results of the study were reported in April 1995.

Women-owned businesses now employ 35 percent more people in the U.S. than the Fortune 500 companies employ worldwide.

Women-owned businesses number 7.7 million, provide jobs for 15.5 million people and generate nearly \$1.4 trillion in sales.

Women-owned firms, while expanding in numbers and employment levels, have remained viable over the longer term. Nearly three-quarters of the commercially active women-owned firms in existence in 1991 were still around in 1995, compared to only two-thirds of all commercially active firms.

Despite that solid record, financing is one of the biggest obstacles faced by women business owners.

The highest growth rates among women-owned firms are in the larger businesses, those with 100 or more employees. The number of such firms grew by 18.3 percent between 1991 and 1994, compared to 9.1 percent for all commercially active women-owned businesses. In addition, employment in these larger women-owned firms expanded by

32.5 percent, compared to 11.6 percent in all women-owned firms, and just 5.3 percent growth in national employment.

### **Women-owned firms participating in the global marketplace are growing more rapidly than women-owned businesses which are primarily domestic**

Monograph – Going Global: Women-Owned Businesses in the International Marketplace

National Foundation for Women Business Owners (Sponsored by AT&T and the MetLife Small Business Center), research, training, and education arm of the National Association of Women Business Owners (NAWBO), March 1995.

Women-owned businesses involved in international trade have higher growth rates than those not involved in international trade:

- 57% of women-owned businesses in the global marketplace developed a new product or service during 1992 compared to 44% of those not in international trade
- 52% of women-owned firms in international trade expanded domestically compared to 23% of those not exporting or importing
- 70% expected sales to grow between 1991 and 1992 compared to 64% of their domestic-oriented counterparts
- 42% expected employment to increase compared to 31% of women-owned businesses not in the global marketplace

“Despite these positive signs, access to capital is constraining growth for women-owned international companies to an even greater extent than it is for women-owned domestic companies. Nearly half (46%) of the women leading international companies cite access to capital as a serious barrier to business growth compared to 38% of women business owners leading domestic companies. Removing this barrier would unleash the potential of these companies to increase their contributions to this nation’s global competitiveness.”

— Laura Henderson, chair of NFWBO, and president and CEO of Prospect Associates

### **Technology is key to growth and success of women-owned businesses**

Study by:

National Foundation for Women Business Owners (NFWBO) (with IBM)

Forty-three percent of the women business owners in the survey describe themselves as “on the leading edge” or “more advanced than average” in quickly adopting new technologies when compared to businesses of similar size in their industry. Fully three quarters report that technology is “very essential” to the functioning of their business today.

Over half (55%) of women business owners plan to increase their investments in information technology in the coming year. Thirteen percent expect to spend \$15,000 or

more on computer systems this year; most (60%) will spend up to \$5,000 on information technology.

Fully 92% of the women business owners surveyed view the Internet as a potential asset to their businesses and expect to use it in the future for business transactions, bidding on business, and accessing information.

“Women-owned businesses are growing more rapidly than is the overall economy. The vast majority of women entrepreneurs recognize that technology is key to their growth and success. They are leveraging information systems in their businesses and positioning themselves to benefit from the latest advances.”

— Laura Henderson, chair of NFWBO, and president and CEO of Prospect Associates

### **Women and men entrepreneurs differ on technology purchase decisions**

Study by:

National Foundation for Women Business Owners (NFWBO)

The study, “Entering the Information Age: Comparing the Role of Computers and Information Technology in Women- and Men-Owned Businesses,” was sponsored by IBM and AT&T.

“Women-owned firms are every bit as focused on keeping technology up-to-date and available for future growth as are men-owned firms,” commented Susan Peterson, NFWBO Chair and President of a Washington, DC communications training firm. “However, women business owners place much more emphasis on service, price, and the vendor’s reputation and experience.”

Fully nine in ten business owners – both women and men – are using computers in their businesses. However, the research showed that the criteria women business owners use for selecting technology and a technology vendor differ from men:

- Almost 80% of women business owners place great importance on a 24-hour or toll-free help line compared to only 63% of men entrepreneurs
- Women business owners are more price sensitive than their male counterparts (92% compared to 85% say that price is an important decision factor)
- Women place higher value on ease of installation and use, a warranty, and the computer vendor’s reputation and experience

In addition, women businesses owners are more likely than men business owners to rely on fellow business owners for information and advice. They are less likely than men business owners to seek technology information from computer-related publications, general interest magazines, business association meetings and the Internet.

“The National Foundation for Women Business Owner’s research shows that the nearly 8 million women-owned firms in the U.S. plan to make \$44.5 billion in computer-related purchases in the coming year.”

— Cherie Piebes, IBM National Executive, Women and Minority-Owned Businesses

### **Forty-two percent of online users are now women**

Late 1996 survey by CommerceNet/Nielsen Media Research

Ten years ago, women made up only 10 percent of online users. Eighteen months ago it was 34%, and today it has grown to 43%.

## ***Who Succeeds in Science?***

Gerhard Sonnert studied sociology, history, and geography in Germany and the United Kingdom. He received his doctorate in sociology from the University of Erlangen, Germany, and a Master of Public Administration degree from Harvard University. He works on Project Access, a large-scale research project on scientists' career patterns.

*Who Succeeds in Science? The Gender Dimension* was published in 1995 by Rutgers University Press, New Brunswick, New Jersey.

Why don't more women become scientists? And why do those who do become scientists often face more difficulties than their male counterparts? Many women who set out to become research scientists fail to reach their goal — for reasons that may have less to do with their scientific ability than with their gender.

Drawing on information gathered from a study that included 699 questionnaires and 200 interviews, the author explores the partly gender-driven dynamics of “the leaky scientific pipeline.” The book includes the life stories of ten women and ten men: half became highly successful scientists, and the rest left research science. They talk candidly about their career paths, the obstacles they encountered and the help they received, and the difficulties and rewards of attempting to combine a family life with a science career.

“Holly’s career path exemplifies some of the problems experienced by many women who enter or reenter a science career at an older age. Her many problems lay at the intersection of family life and career. Twice, these two areas of her life clashed.

“The first time, she decided in favor of her career. The emerging women’s movement had opened her eyes to options beyond family life. The choice to go for a doctorate was probably more difficult for Holly than for most scientists because it involved significant costs: leaving her marriage and her children. She acknowledges that her children suffered because of her departure.

“The second time, she decided in favor of family life. If Holly had held on to her faculty position, she would have probably stayed in an academic science career; but her second marriage to a geographically immobile academic led her to quit this position and move to her new husband’s place. This move, in effect, terminated her research science career.”

— *Who Succeeds in Science?* by Gerhard Sonnert

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. . . and the dozens of additional participants who chose to remain anonymous



## Appendix A: Survey Questions

**WI-1** Which of the following, if any, describes your current job title?  
(READ LIST, ACCEPT MULTIPLE MENTIONS)

- 01 President
- 02 Vice President (including Exec VP, Sr VP, Asst VP)
- 03 Treasurer
- 04 Chairman of the board
- 05 Member of the board
- 06 Owner/partner
- 07 Top management
- 08 CEO (Chief Executive Officer)
- 09 CIO (Chief Information Officer)
- 10 COO (Chief Operating Officer)
- 11 CFO (Chief Financial Officer)
- 12 Director
- OO (DO NOT READ) Other/None of these (SKIP TO NEXT INSERT)
- DD (DO NOT READ) Don't Know (SKIP TO NEXT INSERT)
- RR (DO NOT READ) Refused (SKIP TO NEXT INSERT)

**WI-2** What is the title of the highest level woman in your organization?  
(READ LIST. ACCEPT MULTIPLE MENTIONS)

- 01 President
- 02 Vice President (including Exec VP, Sr VP, Asst VP)
- 03 Treasurer
- 04 Chairman of the board
- 05 Member of the board
- 06 Owner/partner
- 07 Top management

- 08 CEO (Chief Executive Officer)
- 09 CIO (Chief Information Officer)
- 10 COO (Chief Operating Officer)
- 11 CFO (Chief Financial Officer)
- 12 Director
- OO (DO NOT READ) Other/None of these
- DD (DO NOT READ) Don't Know
- RR (DO NOT READ) Refused

**WI-3.** I'm going to read you a list of characteristics that you might look for when you are hiring a person in senior management. Using a scale of 1 to 4, where 4 is extremely important and 1 is not important at all, please tell me how important each of these characteristics are to you when you hire a person, either a man or a woman, in senior management. You can use any number from 1 to 4.

- 4 Extremely Important
- 3
- 2
- 1 Not Important At All
- D (DO NOT READ) Don't Know
- R (DO NOT READ) Refused

(ROTATE)

- a. Analytical ability
- b. Decisiveness
- c. Creativity
- d. Vision
- e. Integrity
- f. Team building skills
- g. Proven track record of business results
- h. Communication skills

**WI-4.** I'm going to read you a list of barriers which can prevent a person in senior management from doing his or her job well. Using a scale of 1 to 4, where 4 has a significant impact and 1 has no impact at all, please tell me how much of an impact each of these barriers has on a person's career. Remember, you can use any number from 1 to 4.

- 4 Significant Impact
- 3
- 2
- 1 No Impact At All
- D (DO NOT READ) Don't Know
- R (DO NOT READ) Refused

(ROTATE)

- a. Unfocused thinking
- b. Indecisiveness
- c. Lack of creativity
- d. Lack of strategic vision
- e. Poor communication skills
- f. Emotionalism
- g. Inability to lead
- h. Inability to meet business objectives

**WI-5.** Thinking about the senior management of your company, who contributes more to the bottom line of your company or organization — men, women, or do they both contribute equally?

- 1 Men
- 2 Women
- 3 Both contribute equally
- D (DO NOT READ) Don't Know
- R (DO NOT READ) Refused

## Appendix B: Poll Questions

- 1)** Are you a female or male?  
  
Female  
  
Male
- 2)** Do you work in a science or technology organization?  
  
Yes  
  
No
- 3)** On a scale of 1 to 4, where 4 is an extremely important factor in professional success and 1 is not important at all, please rate the following positive characteristic: Analytical ability.
- 4)** On a scale of 1 to 4, please rate the following positive characteristic: Decisiveness
- 5)** On a scale of 1 to 4, please rate the following positive characteristic: Creativity
- 6)** On a scale of 1 to 4, please rate the following positive characteristic: Vision
- 7)** On a scale of 1 to 4, please rate the following positive characteristic: Integrity
- 8)** On a scale of 1 to 4, please rate the following positive characteristic: Team building skills
- 9)** On a scale of 1 to 4, please rate the following positive characteristic: Proven track record of business results
- 10)** On a scale of 1 to 4, please rate the following positive characteristic: Communication skills
- 11)** Who do you believe rates higher as a group in analytical ability? (Women, Men, Equal)
- 12)** Who do you believe rates higher as a group in decisiveness? (Women, Men, Equal)
- 13)** Who do you believe rates higher as a group in creativity? (Women, Men, Equal)
- 14)** Who do you believe rates higher as a group in vision? (Women, Men, Equal)
- 15)** Who do you believe rates higher as a group in integrity? (Women, Men, Equal)
- 16)** Who do you believe rates higher as a group in team building skills? (Women, Men, Equal)
- 17)** Who do you believe rates higher as a group in proven track record of business results? (Women, Men, Equal)



- 18)** Who do you believe rates higher as a group in communication skills? (Women, Men, Equal)
- 19)** Listed in the following questions are barriers that can prevent a person from doing his or her job well. Using a scale of 1 to 4, where 4 is significant negative impact and 1 is no negative impact at all, please rate the following negative characteristic: Unfocused thinking
- 20)** Using a scale of 1 to 4, please rate the following negative characteristic: Indecisiveness
- 21)** Using a scale of 1 to 4, please rate the following negative characteristic: Lack of creativity
- 22)** Using a scale of 1 to 4, please rate the following negative characteristic: Lack of strategic vision
- 23)** Using a scale of 1 to 4, please rate the following negative characteristic: Poor communication skills
- 24)** Using a scale of 1 to 4, please rate the following negative characteristic: Emotionalism
- 25)** Using a scale of 1 to 4, please rate the following negative characteristic: Inability to lead
- 26)** Using a scale of 1 to 4, please rate the following negative characteristic: Inability to meet business objectives
- 27)** Having one or more of these negative characteristics may be a barrier to professional success. Who is more prone to unfocused thinking? (Women, Men, Equal)
- 28)** Who is more prone to indecisiveness? (Women, Men, Equal)
- 29)** Who is more prone to lack of creativity? (Women, Men, Equal)
- 30)** Who is more prone to lack of strategic vision? (Women, Men, Equal)
- 31)** Who is more prone to poor communication skills? (Women, Men, Equal)
- 32)** Who is more prone to emotionalism? (Women, Men, Equal)
- 33)** Who is more prone to inability to lead? (Women, Men, Equal)
- 34)** Who is more prone to inability to meet business objectives? (Women, Men, Equal)

Has one of the barriers listed above caused you a problem in your own professional life? If so, please relate the situation briefly below. What was the ultimate result? Did the situation cause you to change your behavior? How?

## Appendix C: Interview Questions

### General Questions

- **G1:** Are you willing to be identified as a participant in this interview? If so, please provide your name, title, and company name.
- **G2:** Are you willing to participate in a follow-up interview by phone or in person? If so, please provide contact information.
- **G3:** Would you characterize yourself as entrepreneur or employee? (Please choose one or the other.)
- **G4:** If you are an employee, do you work for a profit-making or non-profit-making organization?
- **G5:** If you are an employee, is your organization small (1 - 50 employees), medium-sized (50 - 500 employees) or large (over 500 employees)?
- **G6:** Would you characterize your job as manager or individual contributor?
- **G7:** Would you characterize your primary role as technologist or non-technologist?

### Questions Related to the Topic of Business Value

- **V1:** What is the title of the most prominent woman in your organization? How does her contribution provide bottom-line value to your organization?
- **V2:** How do other women provide value to your organization? (Please cite several examples.)
- **V3:** How have you contributed value to your current organization?
- **V4:** What are some specific ways your organization recognizes and rewards value?
- **V5:** A recent study by the Freedom Forum Media Studies Center found that women are quoted or referenced in only 13 to 14 percent of business stories. Does this percentage hold true in your organization? Does the percentage reflect the overall percentage of women in “quotable” positions? If it is low, why do you think this is true?
- **V6:** What is your proudest career accomplishment? What recognition did you achieve for it?
- **V7:** What recognition have you received that was the most pleasing and valuable to you?
- **V8:** Have you ever been “elbowed out” of receiving credit for one of your accomplishments? Describe the situation. Did you protest? To whom? What was the result?

- **V9:** Have you ever passed up an opportunity to take “proper credit” for one of your accomplishments? Did you kick yourself afterwards? Did the experience change your attitude or behavior? How? Do you think women have a “natural modesty” that sometimes prevents them from seeking the limelight?
- **V10:** What motivated you to take your current job? Did the issue of “value” play a significant role?
- **V11:** What caused you to leave your last job? Did the issue of “value” play a significant role?
- **V12:** How would you advise a daughter or younger female colleague on the issue of “getting credit where credit is due”?
- **V13:** Name three obstacles or challenges you face in achieving your career goals. To what extent are they self-imposed and to what extent are they related to barriers in your organization?
- **V14:** Name three science or technology organizations you believe are great places for women to work. How does “value” play a role in the positive reputation they enjoy?
- **V15:** Name three metrics organizations could use to measure their success in recognizing the value women bring to their organizations.
- **V16:** Given background and capabilities equal to other candidates, do you believe you have equal opportunity to be the CEO of your organization?
- **V17:** (If you are or have been an entrepreneur) Why did you start your own organization? Did the issue of “value” play a role?
- **V18:** (If you do business internationally or have contact with science and technology colleagues in other areas of the world) How would you compare the perception of women’s value here and in other countries?
- **V19:** In what ways do you see women “shooting themselves in the foot”?