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## RETAINING AND ADVANCING UNDERREPRESENTED WOMEN IN TECHNOLOGY: INSIGHTS FROM ITSMF EMERGE SURVEY AND FOCUS GROUP

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### ABSTRACT

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Aim/Purpose	In this study, we explore the applicability of the social identity theory and the evolution of an initiative to address the issue of ensuring that women of color not only survive in the technology industry, but that they thrive in every aspect of leadership, including reaching the top senior executive levels (C-Suite) in their organizations.
Background	Despite all the evidence that diverse teams/workforces lead to higher revenues, greater innovation and enhanced creativity, white men still dominate the technology industry.
Methodology	This paper will provide insights gained from a Senior Capstone Project in which North Carolina Central University (NCCU) Computer Information Systems majors and faculty partnered with the Information Technology Senior Management Forum (ITSMF) and Accenture to develop, deploy and analyze a survey and focus group results that identify, quantify and qualify the barriers, nuances and accelerators of Women of Color in technology.
Contribution	This study provides research on a population that has previously not received sufficient focus. While there are studies that have been conducted recently, this is one of the few studies that has been conducted to focus specifically on Women of Color in the technology industry.
Findings	The surveys uncovered several possible reasons why there may not be more Women of Color in high positions.

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Recommendations for Researchers	More studies should be done to address the issues of attrition and lack of women and minorities at the C-Suite in the technology industry, as well as in other STEM industries.
Keywords	diversity, information technology, social identity theory, women, women of color, underrepresented minorities

## INTRODUCTION

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Despite decades of research, programs and initiatives performed by academia, government and industry, the diversity numbers for women and underrepresented minorities in Science, Technology, Engineering and Mathematics (STEM) remain low. Most of these efforts have focused on increasing the pipeline (a student's educational pathway from early education to college graduation) by engaging and empowering girls and minorities during their years in public school. In parallel, programs at the post-secondary level seek to bridge skill discrepancies to aid in recruiting and retaining women and underrepresented minorities to STEM majors. Unfortunately, fewer studies have been done to determine how women and underrepresented minorities fare once they enter their STEM careers. Just as important as the need to increase the access, education and skill sets in kindergarten through 12<sup>th</sup> grade (K-12) and beyond is the need to focus research, programs and initiatives to ensure that the women and underrepresented minorities who have opted for careers in the STEM industry are retained and advanced.

The diversity issues in the STEM industry continue in the U.S., especially in the technology arenas. The U.S. Department of Bureau of Labor Statistics forecasts the employment of computer and mathematical occupations is projected to grow 13.7 percent from 2016 to 2026, faster than the average for all occupations which is 7.4 percent (Bureau of Labor Statistics, 2016). In the technology industry, despite all of the evidence that diverse teams/workforce lead to higher revenues, innovation and creativity, white men still dominate.

This research addresses the issue through providing insights gained from a Senior Capstone Project in which North Carolina Central University (NCCU) Computer Information Systems majors and faculty partnered with Information Technology Senior Management Forum (ITSMF) and Accenture to develop, deploy and analyze survey results and focus group sessions to identify, quantify and qualify the barriers, nuances and accelerators of Women of Color in technology.

## LITERATURE REVIEW

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There is a mounting number of research studies which shows that diversity and inclusion not only make better teams but impacts organizations' overall performance (Badal, 2014; Buse, Bernstein, & Bilimoria, 2014; Hunt, Yee, Prince, & Dixon-Fyle, 2018; Noland, Moran, & Kotschwar, 2016; Rock & Grant, 2016). Unfortunately, for decades the U.S. has struggled with diversity in STEM, especially in the technology industry. Almost daily, there are reports about the lack of diversity and inclusion progress when it comes to women and underrepresented minorities. The problems exist on all levels from K-12 education to post-secondary education; from the workplace to the executive and board levels (Conger, 2017; Donnelly, 2017; Levin, 2018; Mangalindan, 2014; White, 2018).

Most of the prior research on the issue of lack of diversity of women and underrepresented minorities has focused on the pipeline. However, research into the diversity issues can generally be divided into two streams: the pipeline and attrition.

### *PIPELINE*

The growth and proliferation of technology over the last several decades have led to concerns in the U.S. over the educational systems' ability to supply the necessary workforce to support the ever-increasing demand. In the 2017 National Center for Women and information Technology (NCWIT)

*By the Numbers Report*, it is forecasted that by 2026 there will be 3.5 million U.S. computing-related jobs for which only 17% could be filled by U.S. computing bachelor's degree recipients (NCWIT, 2017). Research that addresses the issues in the pipeline typically focuses on ways to get more women and underrepresented minorities interested and engaged in STEM during K-12 and inevitably choosing STEM majors in their post-secondary education.

In fiscal year 2017, the National Science Foundation (NSF) received \$927 million for its strategic commitment to Broadening Participation (BP) Programs in STEM. NSF's BP goal is to expand efforts to increase participation from underrepresented groups and diverse institutions throughout the United States in all NSF activities and programs (Wolfe, 2018). NSF's BP provides grants that target elementary school through postdoctoral training and beyond.

Simultaneously the number of public and private organizations that seek to diversify the technology industry also continues to grow (e.g., Anita Borg Institute, Black Girls Code, Girls in Tech, Girls Who Code, National Center for Women & Information Technology).

Based on data from the 2017 National Center for Education Statistics on Post-secondary degrees conferred in Computer and Information Science, Table 1 shows the number of B.S. degrees conferred in Computer and Information Science from 2010-2016, including a breakout of the number of women by race and ethnicity (National Center for Education Statistics, 2017). As visible from Table 1, there was positive movement in the U.S. in increasing the overall pipeline, but the average percentage of degrees conferred to women remained around 18%.

**Table 1: B.S. Degrees Conferred in Computer and Information Science in the U.S.**

Year	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016
<b>Male Total</b>	<b>35,478</b>	<b>38,796</b>	<b>41,874</b>	<b>45,320</b>	<b>48,844</b>	<b>52,333</b>
<b>Female Total</b>	<b>7,594</b>	<b>8,610</b>	<b>9,088</b>	<b>9,951</b>	<b>10,742</b>	<b>12,072</b>
White	4,124	4,523	4,764	5,150	5,354	5,810
Black	1,503	1,657	1,655	1,592	1,577	1,530
Hispanic	628	749	881	908	1,004	1,146
Asian	778	943	1,002	1,277	1,541	1,977
Pacific Islander	16	45	27	39	50	52
American Indian/ Alaska Native	41	57	74	62	67	50
Two or more races	110	150	203	288	365	523
Non-resident alien	394	486	482	635	784	984

Note: Data for B.S. Degrees Conferred in Computer and Information Science in the U.S. from National Center for Education Statistics (2017)

**Table 2: U.S. Computer and Mathematical Occupations**

Year	2010	2011	2012	2013	2014	2015	2016	2017
Total employed (number in thousands)	3,531	3,608	3,816	3,980	4,303	4,369	4,601	4,804
% Men	74.2	75.0	74.4	73.9	74.4	75.3	74.5	74.5
% Women	25.8	25.0	25.6	26.1	25.6	24.7	25.5	25.5
% White	75.4	74.7	72.7	70.9	70	68.4	67.9	67.8
% Black or African American	6.7	6.9	7.4	8.3	8.3	8.6	7.9	8.7
% Asian	16.1	16.6	17.5	18.5	19.2	19.9	21.3	20.8
% Hispanic or Latino Ethnicity	5.5	5.7	6.1	6.3	6.6	6.8	6.8	7.3

Data for U.S. Computer and Mathematical Occupations from Bureau of Labor Statistics (2018)

**Table 3: U.S. Computer and Information Systems Managers**

Year	2010	2011	2012	2013	2014	2015	2016	2017
Total employed (number in thousands)	537	553	605	602	629	652	597	630
% Men	70.1	74.7	73.2	71.4	73.3	72.8	74.5	71.4
% Women	29.9	25.3	26.8	28.6	26.7	27.2	25.5	28.6
% White	82.7	79.4	76.7	78.5	79.4	77.4	77.4	78.0
% Black or African American	6.8	5.7	5.6	5.0	6.3	5.6	6.2	6.6
% Asian	9.0	12.9	14.5	14.1	11.6	14.2	15.2	13.0
% Hispanic or Latino Ethnicity	7.2	3.8	5.8	4.3	4.9	4.8	6.7	6.6

Data for U.S. Computer and Information Systems Managers from Bureau of Labor Statistics (2018)

The U.S. Equal Employment Opportunity Commission requires every employer that is subject to Title VII of the Civil Rights Act of 1964, as amended, and that has 100 or more employees, to complete an annual EEO-1 Survey which requires company employment data to be categorized by race/ethnicity, gender and job category. Table 2 shows the Bureau of Labor Statistics for the Computer and Mathematical Occupations for 2010-2017, including a breakout of the percentage of women by race and ethnicity. Table 3 shows the Bureau of Labor Statistics for Computer and Information System Managers for 2010-2017, including a breakout of the percentage of women by race and ethnicity. In 2017, the U.S. Population is comprised of 51% Women, 61% White, 6% Asian, 18% Latino, 13% Black/African-American and 3% Multi-racial. However, as is shown in Tables 2 and 3, the technology industry does not reflect the same diversity.

### *ATTRITION AND SOCIAL IDENTITY*

While there continues to be a growing number of research projects and diversity initiatives focused on increasing the number of women and underrepresented minorities in the technology pipeline, less research addresses the attrition, retention and advancement of women and underrepresented minorities once they are in the technology industry. Even fewer studies can be found which illustrate the impact that social identity has on attrition with minorities in the technology industry. The attrition factor traditionally focuses on why the technology industry has a higher number of women and underrepresented minorities leaving the industry. On average women and underrepresented minorities typically depart the technology industry faster than companies hire from this same demographic.

According to Carpio and Guadalupe (2018), women decide whether to enter the technology industry (rather than go to the services sector) as a function of their “technology” and “services” skills, returning to those skills and what we refer to as an “identity wedge” of entering a stereotypically male sector such as technology. The paper further states that this identity component affects the expected returns to technology employment by driving a wedge between the actual returns to skill and the expected returns. This wedge can capture several mechanisms associated with social identity. One is the distorted belief that women cannot be successful in certain industries, as implied by stereotypical thinking based on a “representative heuristic” (Bordalo, Coffman, Gennaioli, & Shleifer, 2016, Kahneman & Tversky, 1973).

Hewlett et al. (2008, 2014) showed that while the female talent pipeline for Science, Engineering, and Technology (SET) was very robust, women were dropping out of these fields in droves. Over time 52% of highly qualified women working in SET companies quit their jobs. Their research also illustrated that 41% of women were at the lower levels of the corporate hierarchy. These disparaging facts have prompted this research and its use of social identity theory as a lens to examine why women and underrepresented minorities, who initially self-select (Borjas, 1987) to work in a STEM indus-

try, leave the technology sector. This study applies the social identity principle (Tajfel, 1978; Tajfel & Turner, 1979) to establish a theoretical framework in which to understand the challenges facing women and underrepresented minorities seeking employment, in-group acceptance and equity in advancements in the technology industry environment.

This study applies the social identity component, which states that a person's social identity is a person's sense of who they are based on their group membership(s). Tajfel (1981) proposed that the groups (e.g., social class, family, football team, occupation) which people belong to are an important source of pride and self-esteem. Groups give individuals a sense of social identity: a sense of belonging to the social world. To increase one's self-image, people enhance the status of the group to which they belong. Therefore, people divide the world into "them" and "us" through a process of social categorization (e.g., they put people into social groups). Social identity theory states that the in-group will discriminate against the out-group to enhance their own self-image.

Social identity theory, as it relates to the technology industry and certain human demographics, is that group members of an in-group will seek to find negative aspects of an out-group, thus enhancing their self-image. Prejudiced views between cultures may result in racism, genderism, ageism, sexism and discriminations in its extreme forms. Tajfel and Turner (1979) proposed that stereotyping (e.g., putting people into groups and categories) is based on a normal cognitive process: the tendency to group things together. In doing so people tend to exaggerate: (a) the differences between groups and (b) the similarities of things in the same group.

Tajfel and Turner (1979) proposed that there are three mental processes involved in evaluating others as "us" or "them" (e.g., in-group and out-group). These take place in the order shown in Figure 1 below.

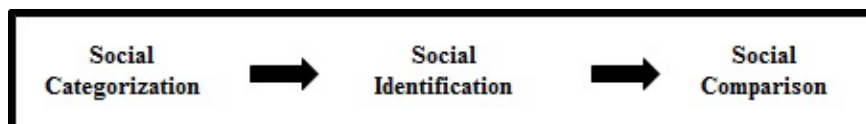


Figure 1: Social Identity Theory

The first is **categorization**. One categorizes objects to understand them and identify them. In a very similar way, one categorizes people (including ourselves) to understand the social environment. Social categories (e.g., black, white, American, Indian, Christian, Muslim, student, teacher, software engineer, accountant) are leveraged because they are useful designations.

In the second stage, **social identification**, people adopt the identity of the group to which they have categorized themselves as belonging. For example, if someone self-categorizes as a student, then chances are that person will adopt the identity of a student and begin to act in the ways that they believe students act; they will conform to the norms of the group. There will be an emotional significance to their identification with the group and their self-esteem will become bound with that group membership.

The final stage is **social comparison**. Once one has self-categorized as part of a group and has identified with that group, that person then tends to compare that group with other groups. For self-esteem to be maintained, the select group needs to compare favorably with other groups. Social comparison is critical to understanding prejudices and discrimination, because once two groups identify themselves as rivals, they are forced to compete for members to maintain their self-esteem. Competition and hostility between groups are not only a matter of competing for resources like jobs but also the result of competing identities.

Hence, this study finds the social identity theory appropriate to explain the competing factors that exist within the technology industry with respect to the acceptance of women and underrepresented minority groups. Since the current technology industry in the U.S. is predominately white males, their social identity in-group views others (e.g., females, underrepresented minorities) as the out-

group(s) and may consider/view self-interest above equity goals. This research strives to identify the obstacles the out-group(s) encounter to prescribe interventions and recommendations for a more inclusive, diverse, economical and socially rewarding technology industry.

## **BACKGROUND**

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### ***NORTH CAROLINA CENTRAL UNIVERSITY***

North Carolina Central University (NCCU) was founded in 1909 as the National Religious Training School and Chautauqua by Dr. James Edward Shepard. It became the first public liberal arts institution for African-Americans in the nation. The University is now a master's comprehensive institution that offers bachelors and master's degrees, a Juris Doctor, and a Ph.D. in Integrated Biosciences to a diverse student population. NCCU was the first UNC System campus to require community service for graduation and has gained national recognition from the Carnegie Foundation as a community-engaged university.

The Computer Information Systems (CIS) Senior Capstone Project is a two-semester process in which majors, with the guidance of a faculty mentor, undertake a real-world project as an individual or team that researches a question or problem relevant to the discipline and produces a substantial paper or system that reflects a deep understanding of the topic.

### ***INFORMATION TECHNOLOGY SENIOR MANAGEMENT FORUM (ITSMF)***

The Information Technology Senior Management Forum (ITSMF), formed in 1996, began with a conversation between a few prominent technology executives who found that only 3% percent of information technology management roles were being held by Black professionals. Studies suggested that not enough Black professionals were positioned for senior-level technology positions. This discussion sparked those executives to action as they were compelled to reach, teach and cultivate those aspiring technology professionals. Under the leadership of Carl Williams, the 501(c)(3) organization was founded in Chicago, Illinois and began the work of recruiting those Black professionals who ranked among the Who's Who in technology; as well as those companies and individuals looking to support the mission of the organization. ITSMF, celebrating its 22nd year, remains the only national organization dedicated exclusively to cultivating executive talent among Black technology professionals. ITSMF increases the representation of black professionals at senior levels in technology to impact organizational innovation and growth. They do this by developing and nurturing these dynamic leaders through enrichment of the mind, body and soul.

### **ITSMF Women's Leadership Forum (WLF) and EMERGE**

Based on the analysis of membership, ITSMF recognized the need to target and support Women of Color in their programming. ITSMF launched a Women's Leadership Forum whose charge was to work to increase the representation of Women of Color at senior levels of IT through providing a series of professional workshops, webinars and thought leadership.

The ITSMF Women's Leadership Forum (WLF), formed in 2014, goal was to offer ITSMF members an intimate place to learn, share personal and professional experience, seek advice and gain insight into their careers through peer-to-peer networking, relationship building and leadership development. It also aimed to identify opportunities to expose young girls of color to role models in the STEM and technology industry. The WLF seeks to sustain the career progression of Women of Color in the technology industry fostering an environment that is nurturing, collaborative and supportive along the career continuum. The WLF seeks not only to elevate Women of Color skills, knowledge and abilities but also to provide the appropriate mentors and coaching to proactively prepare them to navigate the career pipeline. WLF deliverables include research to determine the current landscape, evaluation of the findings and the identification of any "roadblocks" that will be used in the further development of tailored programmatic elements to address these challenges. In 2015, after a strategic

planning session, ITSMF rebranded the Women's Leadership Forum to ITSMF EMERGE (aka EMERGE). EMERGE goals are to:

- Offer intimate connections to develop and nurture the natural talents of Women of Color leaders.
- Provide insight and action to accelerate advancement of Women of Color in technology.
- Amplify professional skills by addressing and enhancing the nuances for Women of Color.

## ***ACCENTURE***

Accenture is a global management consulting and professional services firm that provides strategy, consulting, digital, technology and operations services. They partner with more than three-quarters of the Fortune Global 500, driving innovation to improve the way the world works and lives. With expertise across more than 40 industries and all business functions, they deliver transformational outcomes for a demanding new digital world. Accenture helps organizations assess how to maximize their performance and works with them to achieve their vision. They develop and implement technology to improve clients' productivity and efficiency. Ultimately, they enable their clients to become high-performance businesses and governments.

Accenture embraces inclusion and diversity in the widest possible sense – beyond gender, ethnicity or religion – this is part of a powerful recipe for success and fundamental to their culture and core values. Their inclusion and diversity initiatives underpin their focus on building a dynamic workforce that is equipped with the skills, passion and energy to deliver high performance to their clients.

Accenture is a proud supporter of the ITSMF Women's Leadership Forum and EMERGE to advance the careers of Women of Color in IT and help develop leaders of tomorrow.

## **METHODOLOGY**

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This study was divided into two distinct phases. In the first phase, a survey was designed to gain insight on the following questions:

- Is social identity theory applicable to the STEM environment?
- Can social identity theory explain the lack of diversity in the technology industry?
- What is keeping Women of Color in the technology industry from advancing their careers and entering the C-Suite?

The survey was designed to cover the following areas:

- Demographics
- IT Background
- Desire to be promoted to the C-Suite
- Issues/Opportunities for Attracting – Developing – Retaining Women of Color
- Perceived differences between Men vs. Women and Women of Color vs. other Women

The survey design went through five (5) iterations. The following is a synopsis of the survey design iterations including where pilot testing occurred:

- Iteration 1 consisted of 14 questions
- Iteration 2 consisted of 36 questions
- Iteration 3 consisted of 69 questions (pilot tested internally with the ITSMF EMERGE Committee)
- Iteration 4 consisted of 73 questions (pilot tested externally within Accenture)
- Iteration 5 consisted of 59 questions (pilot tested internally with the ITSMF EMERGE Committee and Executive Board)

Once finalized, the survey was sent to the ITSMF membership, strategic alliance partners and corporate partners which included approximately 3,000 potential participants. The survey remained open for 36 days, with potential participants receiving a reminder email after 30 days to increase the number of respondents.

A total number of 270 respondent surveys were received with a final sample of N=265. Four (4) respondent surveys were excluded due to less than 1/3 of the survey questions being completed and one (1) survey was excluded due to conflicting information within the survey.

In the second phase of this study three focus groups were held with 60 Women of Color from various levels in the information technology industry. The goal was to present the survey findings from the first phase and to gather suggestions on the following questions:

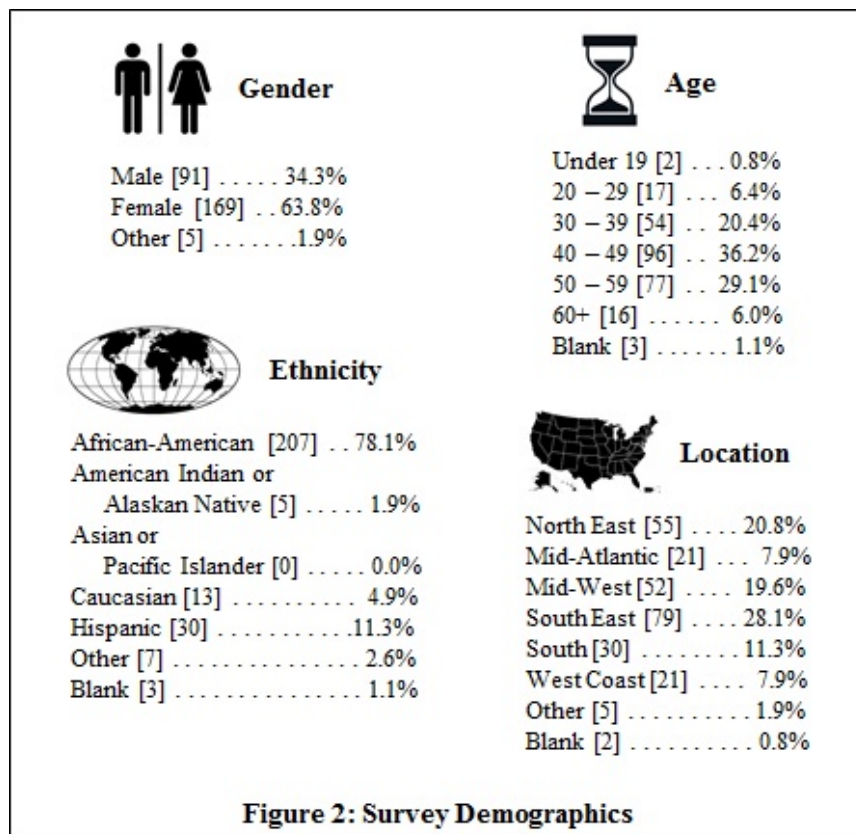
- What are the areas that can be addressed to help the findings of the survey?
- What are the key actions that need to be taken?

## SURVEY DEMOGRAPHICS

In the phase one survey there was some representation in all demographic categories of the survey. However, most of the respondents fell into the following categories:

- Females (63.8%)
- African-American (78.1%)
- 40-49 years old age group (36.2%)

Because of the stated purpose of the survey, there was an expectation that the numbers of African-Americans and women would be the strongest groups represented. Figure 2 shows the detailed survey demographics for the respondents.





The survey respondents also had varying year ranges of technology experience and held a multitude of positions in their organizations. Table 4 shows the years of technology experience and Table 5 shows the current organization position for all respondents. Based on the data in Tables 4 and 5, there appears to be an imbalance between years of experience and position in the organization, especially in upper management (e.g., Vice President, EVP, Executive Director, C-level Executive) compared to people with more than 25 years of work experience.

Criteria	Responses	Percentage
Less than a year	5	1.9%
1 - 2 years	7	2.6%
3 - 5 years	22	8.3%
6 - 10 years	25	9.4%
11 - 15 years	31	11.7%
16 - 20 years	54	20.4%
21 - 25 years	36	13.6%
More than 25 years	48	18.1%
N/A	36	13.6%
Not answered	1	0.4%

Criteria	Responses	Percentage
Owner/Partner	15	5.7%
C-level Executive	14	5.3%
Executive Director or similar	7	2.6%
EVP or equivalent	3	1.1%
Vice President or equivalent	22	8.3%
Director or equivalent	54	20.4%
Manager or equivalent	55	20.8%
Professional	38	14.3%
Technical	23	8.7%
Sales	3	1.1%
Consultant	13	4.9%
Administrative	3	1.1%
Other	14	5.3%
Not Answered	1	0.4%

## SURVEY RESULTS

This section provides phase one survey results that align with answering the following questions:

- Is social identity theory applicable to the STEM environment?
- Can social identity theory explain the lack of diversity in the technology industry?
- What is keeping Women of Color in the technology industry from advancing their careers and entering the C-Suite?

To assess where the respondents were with their current job satisfaction, they were asked “Which of the following statements best describes your current job situation?” As Table 6 shows, 42.3% (112)

of the respondents indicated that they were satisfied, not looking for new opportunities. However, 56.2% (149) of respondents indicated they that were not satisfied with their current job and in most cases were looking for other opportunities, both internal and external to their current organization. A follow-up question asked dissatisfied respondents to provide insight into why they were not satisfied. The following were the top three reasons specified:

- Feeling underappreciated/undervalued
- No opportunity for advancement
- Burned out

**Table 6: Job Satisfaction**

Criteria	Responses	Response Rate
Satisfied, not looking for new opportunities	112	42.3%
Dissatisfied, but not seeking new opportunities	11	4.2%
Looking for another opportunity inside company	52	19.6%
Looking for another opportunity outside company	66	24.9%
Planning to start my own business	20	7.5%
Not Answered	4	1.5%

To determine if the respondent had the desire to reach the C-Suite they were asked “Do you have the desire to reach the C-Suite?”. Table 7 shows that 54.3% (144) of the respondents had a desire to reach the C-suite. The respondents that answered “no” or “maybe” were again asked to expound on their choice. The following were the top three reasons specified:

- Work/Life balance
- Uncertain how/what it takes to reach C-Suite
- Not sure it would be worth the sacrifice

**Table 7: Desire to reach C-Suite**

Criteria	Responses	Response Rate
No	61	23.0%
Yes	144	54.3%
Maybe	58	21.9%
Not Answered	2	0.8%

To determine what the respondents perceived as the opportunities needed for women to advance to the C-Suite the following question was posed: “What do you see as the greatest opportunity for women advancing to the C-Suite?”. Table 8 shows all of the major responses. The top response, 41.1% (109), was that increased visibility/platform was needed. Executive Presence received 21.1% (56) and technical experience/the right role received 18.1% (48) to complete the top three responses.

To determine if the respondents felt that they had the necessary internal support to develop and advance in their careers, they were asked “Do you feel you have the internal support you need to develop and advance your career?”. Over 51% (136) of respondents stated that they did not feel that they had the internal support to develop and advance in their career. Table 9 shows the detail for all responses.

To further provide insight into the respondents’ perception of their ability to develop and advance in their IT career, they were asked to provide up to three reasons to the question “What do you think is the greatest obstacle to your development and advancement?”. The top three responses were: Lack of Opportunities (59); Work/Life Balance (48); and Institutional Bias (48). Table 10 shows the details of all of the groupings of textual responses.

**Table 8: Greatest opportunity for women advancing to the C-Suite**

Criteria	Responses	Response Rate
Technical experience / the right roles	48	18.1%
Executive Presence	56	21.1%
Increased visibility/platform	109	41.1%
Exposure to other women in the C-Suite	39	14.7%
Other (please specify)	10	3.8%
Not Answered	3	1.1%

**Table 9: Internal support to develop and advance career**

Criteria	Responses	Response Rate
No	136	51.3%
Yes	123	46.4%
Not Answered	6	2.3%

**Table 10: Greatest obstacle to your development and advancement**

Criteria	Responses	Response Rate
Lack/Limited Opportunities/Exposure/Advancement/Position/Resources	58	25.3%
New; about to retire; Starting own company	4	1.7%
Current Position/Mgr won't let advance/Too valuable	5	2.2%
Visibility/International Experience/Position	7	3.1%
Happy where I am	2	0.9%
Advancement process not clearly defined/communicated	9	3.9%
Playing/political field not level - Institutional Bias - Good Ol' Boys Network – Perceptions	47	20.5%
Need/Loss of Sponsorship/Mentorship	24	10.5%
Self; Work/Life Balance; Time	48	21.0%
Low/No C-Suite Positions Available, pool of qualified applicants	9	3.9%
Other Women	1	0.4%
Other People of Color	1	0.4%
Networking Opportunities	4	1.7%
Other	10	4.4%

To determine if the respondents viewed that differences exist between females' and males' experiences in the technology industry, they were asked "Are there differences between female and male experiences in technology?" Over 75% (200) of the respondents affirmed that there were differences in the female and male experiences in the technology industry (see Table 11). When the respondents were asked to provide up to three of the differences between the sexes' experiences, the top responses were: Good Ol' Boys Network/Industry (53); women overlooked – visibil-

ity/opportunity (36); and women have a harder time being heard/appreciated/valued (24). See Table 12 for the detailed list of differences given.

**Table 11: Differences between female and male experiences in the technology industry**




Criteria	Responses	Response Rate
No	46	17.4%
Yes	200	75.5%
Not Answered	19	7.2%

**Table 12: Differences between females and males experiences in the technology industry**









Criteria	Responses	Response Rate
Good old boys Network/Industry Culture/Unconscious bias	52	25.6%
Perceptions that men or more technical/smarter	19	9.4%
Women have tougher time begin heard/appreciated/valued (have to be 2X as good)	24	11.8%
Women overlooked - Visibility/Opportunity	36	17.7%
Valued/Perceived different when expressing thoughts/ideas/marketing Women (forward/aggressive/negative)	16	7.9%
Low or No Women or People of Color in leadership Positions in Organizations	9	4.4%
Perception of women being more emotional/Emotional Intelligence	9	4.4%
Inequality in rewards/pay	7	3.4%
Sponsorship/Mentorship/Networking	6	3.0%
Comradery among men	13	6.4%
Self: doubt/confidence/life experiences	2	1.0%
Other issues	10	4.9%

To further investigate the possible differences, respondents were asked to answer the following question “Are there differences between Women of Color and Caucasian female experiences in the technology industry?”. As shown in Table 13, 65% (173) of the respondents indicated that there were differences in the experiences of Women of Color and Caucasian women in the technology industry. A follow-up question was asked for reasons for the differences. The top three reasons given were: Access/Exposure/Opportunity/Visibility (34); acceptance/inclusion by/with Caucasian males (28); and difference in the perceptions of skills, leadership and intelligence (23). See Table 14 for the detailed list of differences given.

**Table 13: Difference between Women of Color and Caucasian women's experiences in the technology industry**

Criteria	Responses	Response Rate
No	69	 26.0%
Yes	173	 65.3%
Not Answered	23	 8.7%

**Table 14: Difference between Women of Color and Caucasian women's experiences**

Criteria	Responses	Response Rate
Difference in perceptions of skills, leadership and intelligence	23	 15.2%
Access/Exposure/Opportunities/Visibility	34	 22.5%
Network/Support/Relationship	11	 7.3%
Difference in level of value/respect	21	 13.9%
Acceptance/Inclusion/Comfort Level/Fit by/with White Males	28	 18.5%
Leadership in the organization	5	 3.3%
Other Stereotypes	16	 10.6%
Don't Know	13	 8.6%

## SURVEY KEY FINDINGS

Based on the phase one survey results, one possible reason why there may not be more Women of Color in the C-Suite is because Women of Color may not stay in their companies or even the IT industry long enough to make it to the C-Suite. This is often the result of Women of Color not being satisfied with their current positions, opportunities, and/or potential for advancement. Most Women of Color in these dilemmas often look for another opportunity inside and outside the company; such changes may impact their career trajectory.

The three obstacles with the technology industry that are impacting this are:

- Developing and/or maintaining technology/technical skills;
- Industry bias | company culture; and
- Lack of opportunities | visibility in organization.

The three obstacles to development and advancement:

- Opportunity and/or advancement;
- Self | work/life balance | time; and
- Institutional bias.

The three obstacles to progression to the C-Suite:

- Work/life balance;
- Uncertainty as to how | what it takes; and
- Self-Worth.

Based on these key findings, in phase two focus groups were used to provide further insight and recommendations.

## **FOCUS GROUP RESULTS**

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Based on the phase one survey results, three focus groups were held with 60 Women of Color during an ITSMF EMERGE session to further tease out the unique issues for Women of Color and other issues that are exacerbated and may be keeping them from developing and advancing to the C-Suite in the technology arena. Another intent was also to identify the areas that can be addressed to aid the situation. The focus groups goals were to analyze and discuss the findings of the survey and to make recommendations for EMERGE programmatic content on the following questions:

- What are the areas that can be addressed to help the findings of the survey?
- What are the key actions that need to be taken?

Each of the three focus groups contained Women of Color from a variety of levels and were facilitated by seasoned executives. The participants were randomly placed in one of the following groups:

- Group A: The realities of balancing work and life
- Group B: Creating a successful platform and executive presence
- Group C: Identifying career opportunities and navigating bias

### ***GROUP A: THE REALITIES OF BALANCING WORK AND LIFE***

For Group A: The realities of balancing work and life, participants were asked the following questions to stimulate the dialogue:

- What is work/life balance?
- Does your company support work/life balance?
- What are some of the issues of achieving work/life balance?
- Is work/life balance the same for women and men?

Based on the questions, below are selected responses provided by the participants:

- *“It’s hard to have work/life balance when you face stereotypes / lack of corporate confidence in you”*,
- *“Being ‘The Only One’ often leads to believing you have to over-perform”*,
- *“Mommy Guilt” – you have to bringing kids/family along on the work journey”*,
- *“Super Women Complex – it’s hard setting boundaries and/or manage expectations”*.

To strengthen work/life balance, the following programming opportunities were suggested:

- C-Suite Journey Stories: sharing life paths and best practices,
- Networking; How to build effective networks to improve work/life balance,
- Life coaches and accountability partners,
- C-Suite Profile: What does life really look like getting there and staying there “decade approach” or “stages approach”.

### ***GROUP B: CREATING A SUCCESSFUL PLATFORM AND EXECUTIVE PRESENCE***

For Group B: Creating a successful platform and executive presence, participants were asked the following questions to stimulate the dialogue:

- How do you determine what paths to take, getting the information you need?
- Once you know your options, how do you build/grow your career platform?
- How do you impact your business?
- How do you know where you are with people/technical/personal skills?

Based on the questions, below are selected responses provided by the participants:

- *“You don’t always have opportunities assigned to you – you have to find things that are broke and fix them. This helps you build your “toolkits” that you can leverage on other assignments”*,
- *“It’s hard to brand yourself (toot your own horn) without seeming arrogant”*,
- *“You must be able to illustrate how you impact the business and add business value, especially on your annual performance reviews/evaluations”*,
- *“Find someone you want to emulate and identify what they are doing that makes them successful. Ask others their thoughts on that person you want to emulate to get their perspectives”*.

To enhance creating a successful platform and executive presence, the following programming opportunities were suggested:

- Forum to share experiences and insights,
- Road map/best-practices/protocols for vertical movement,
- Creating Board of Directors: Network, Mentor, Coach, Sponsors Relationships for Advancement,
- Executive Presence – How to Command not demand. Establishing a voice of authority based upon your presence.

### ***GROUP C: IDENTIFYING CAREER OPPORTUNITIES AND NAVIGATING BIAS***

For Group C: Identifying career opportunities and navigating bias, participants were asked the following questions to stimulate the dialogue:

- How do you define bias? Biases felt and biases projected.
- As a woman professional, what do you believe is the biggest or most common bias faced in the work place? What unique opportunities do we have because of it?
- If every organization has a unique culture, what would you need to know in order to identify career opportunities?
- Visibility and exposure are necessary for advancement, what other factors in your career have been important?

Based on the questions, below are selected responses provided by the participants:

- *“Opportunities exist but Women of Color have to overcome lots of barriers/obstacles in order to be considered”*,
- *“Your Voice is often questioned in the delivery of messages. Women of Color are often asked to change to make others comfortable but it’s not reciprocal”*,
- *(Choice vs. Being Tapped) “You often don’t know the opportunities that exist”*,
- *“You need sponsorship, the right connections”*.

To strengthen career opportunities and mitigate bias, the following programming opportunities were suggested:

- Identifying the Talent Management and framing your interest to the right stakeholders/sponsors.
- What to do with the information/feedback that you get, especially if it’s negative or contains biases
- Understanding what Talent Management is, who is sitting at the table, and what they know/say about you
- Seeing in yourself what others see in you (Confidence in your Competence and Skills)

## FOCUS GROUPS KEY FINDINGS

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Based on the phase two focus groups responses and suggested programming opportunities, a programming framework was established for the EMERGE – “Seek, Study, Soar”.

- **Seek** - Gain a deep and personal awareness of their beliefs, values, and stressors as a female leader.
- **Study** – Become knowledgeable about leadership beliefs, behaviors, and responsibilities.
- **Soar** – Expand your toolset and perform as a newly emerged female executive.

The EMERGE curriculum and delivery methods were further developed and piloted by the EMERGE Committee.

## CONTRIBUTION AND STUDY LIMITATIONS

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This study provides research on a population that has previously not received sufficient focus. While there are studies that have been conducted recently, this is one of the few studies that has been conducted to focus specifically on Women of Color in the technology industry. For diversity and inclusion efforts to work, not only must all voices be present at the table and heard, but everyone must also be given the access and opportunity to develop and advance in their career.

While this study provides insights and recommendations for programming aimed at helping Women of Color in their advancement in the technology industry, the most significant limitations of this study are:

- For some of the survey questions, definitions and baselines should have been given prior to the questions. This would have ensured that respondents were indeed responding to the same elements (e.g., the definition of Women of Color, jobs typically considered to be within the C-Suite).
- While there was a mixture of demographics in the respondent pool, most of the respondents were African-American women. This was driven by the makeup of both the ITSMF’s membership base and its partners’ survey group, as well as the goals under which the partnership was established (e.g., African-American centric).
- The study was also solely U.S. focused. Further studies that are more globally oriented are needed to determine if the social identity theory holds and/or can be used to provide insight on the differences between social groups within technology and other STEM industries.

In future research, definitions and baselines will be given and questions will be better clarified. Future studies will also seek to engage a boarder range of respondents and Women of Color in order to broaden comparisons of the findings. Future studies will also incorporate interviews with Women of Color that have reached the C-Suite.

## CONCLUSIONS

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This paper presents the results of a two-phase study that utilized a survey and focus groups to provide insights gained that identify, quantify and qualify the barriers, nuances and accelerators of Women of Color in technology. These findings suggest that Women of Color face barriers in advancing and excelling to the C-Suite in the technology industry.

In phase one, a survey was designed to gain insight on the following questions:

- Is social identity theory applicable to the STEM environment?
- Can social identity theory explain the lack of diversity in the technology industry?



- What is keeping Women of Color in the technology industry from advancing their careers and entering the C-Suite?

The survey results showed that social identity is applicable in the technology industry in the U.S. Respondents stated that they felt the lack of visibility and opportunity to advance is attributable to not being a part of the dominate social group. Besides often being “the only one” in their organizations, Women of Color also provided obstacles such as having to prove/maintain their technical proficiency to be considered competent, balancing work/life commitments and facing continued institutional bias.

In the second phase of this study three focus groups were held with 60 Women of Color from various levels in the information technology industry. The goal was to present the survey findings from the first phase and to gather suggestions on the following questions:

- What are the areas that can be addressed to help the findings of the survey?
- What are the key actions that need to be taken?

Participants provided responses and recommendations for the creation of curriculum to address and mitigate the issues identified both in the phase one survey and from their personal experiences. Their suggestions included curriculum initiatives concerning: the realities of balancing work and life; creating a successful platform and executive presence; and identifying career opportunities and navigating bias such as:

- C-Suite Journey Stories: sharing life paths and best practices
- Creating Board of Directors: Network, Mentor, Coach, Sponsors Relationships for Advancement
- Understanding what Talent Management is, who is sitting at the table, and what they know/say about you

The study reported in this paper is unique in its scope, focus, and population. While there has been a plethora of studies focused on getting women and minorities into the STEM pipeline, few have focused on how to ensure that once they join the workforce, they are retained and advanced. This study showed that Women of Color may not stay in their companies or the technology industry long enough to make the C-Suite ranks due to a lack of satisfaction with their development and advancement opportunities. More studies should be done to address the issues of attrition and lack of women and minorities at the C-Suite in the technology industry, as well as in other STEM industries.

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