

What She Said: Barriers and Enablers to Career Advancement for Women in the Nova Scotia ICT Sector

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This preliminary research paper explores the careers of women in senior Information Communications and Technology (ICT) positions in a Nova Scotia (NS) context. Interviews with female ICT executives provide preliminary insight into the barriers and enablers to career advancement that they experienced. The research approach sets out a larger case study involving male and female executives from Nova Scotia and other non-Nova Scotia regions. The findings describe a cohort of female ICT executive who are generally happy with their careers and the impact that they have had despite the barriers that they encountered. Barriers that were identified included internal self-doubt, an unwelcoming male-dominated environment, lower compensation, limited social networks, stereotypes, and maternity leave. Career enablers were determination, self-promotion, accepting the 'bitch' label, networking, embracing work related travel, pursuing stretch assignments, sponsorship, accountability for diversity within organizations, family support, and changing social values.

Key Words and Phrases: ICT Careers, Diversity, Women in Technology, Human Resource Management

ACM Reference Format:

Jules J. Fauteux. 2014. What she said: Barriers and enablers to career advancement for women in the Nova Scotia ICT sector. *DCSI 2014*, (September 2014), 23 pages.

1. INTRODUCTION

There is a large and growing body of research about the under-representation of women in the information, communications, and technology (ICT) sector. Research describing the problem is abundant but the exploration of solutions has been limited [Trauth et al. 2010]. No peer reviewed research was found that considered the problem or solutions within the context of Nova Scotia (NS). The purpose of this preliminary case study is to examine the careers of women executives in the NS ICT industry in order to gain insight into the barriers and enablers to their career advancement. A larger case study involving both male and female executives is planned and will allow for more generalizable findings and the development of solutions that may help to realize greater gender balance at senior levels in organizations.

In Nova Scotia, women are under-represented in the ICT sector and at senior levels [Digital Nova Scotia 2014]. The availability of IT workers is considered important to competitiveness and the economic health of nations [Trauth et al. 2008]. Nova Scotia's economic future is dependent on a renewed workforce and improved innovation [Ivany 2014]. Further development of growth sectors, such as ICT, is strategic for the province [Nova Scotia Government 2013]. Shortages in the ICT workforce in NS are forecast to grow [Information and Communications Technology Council 2012]. Increasing the representation of women in ICT is an opportunity to reduce the predicted workforce shortage and improve the economic future of NS.

This purpose of the research was to explore the careers of executives working for large ICT companies in NS. The following research questions are explored in this preliminary study:

- 1) What have been the career experiences of executive women in the ICT sector in NS?
- 2) What barriers and enablers to career advancement have these women experienced?

This work has been sponsored by Digital Nova Scotia and is funded in part by a Mitacs Accelerate PhD Grant.

This paper is organized into four sections following the present introduction, including: a review of the literature, explanation of the methodology, discussion of findings from the preliminary study, and concluding remarks including study shortcomings and next steps in the research.

2. LITERATURE REVIEW

In this section a broad range of literature from the disciplines of management, computer science, and social sciences is explored. The review begins with the topic of women in the workplace and the benefits of gender diversity, moving to the topic of careers and women in ICT, and then concludes with literature about barriers and enablers to the advancement of careers for women.

2.1 Women in the Workplace and the ICT Sector and the Benefits of Gender Diversity.

2.1.1 Women in the workplace

In the early 1900's, women represented less than 20% of the United States (US) workforce. By 1945 the representation of women in the workplace grew significantly to more than 50%. This was largely due to increased demand for women to fill jobs that were previously held by men during World War II. By 1960, this number had declined to about 35% [Hill 2013]. Women in the Canadian workforce experienced a similar growth and decline. More recently the representation of women in the Canadian workplace is near parity with men. However, the balance tips towards men as one moves up the corporate ladder to positions of higher scope, authority, and compensation [Catalyst 2014a]. Women occupy 5.3% of the most senior positions in Canadian business as either Chief Executives or Heads of organizations. Boards of Directors in Canada are 15.9% comprised of women with 18.1% of senior officers being women and 35.7% of management occupations being filled by women [Catalyst 2014a]. Women represent 52.3% of the NS population¹ and 50.5% of the workforce² [Statistics Canada 2014].

2.1.2 Women in the ICT sector

As an emerging sector, the definition of the ICT sector has changed. For the purposes of this paper, the National Occupations Classification codes commonly used to define the ICT workforce are used. The representation of women relative to men in ICT related jobs³ in NS is 20.4% [Statistics Canada 2011]. Women occupy 24.1% [Statistics Canada 2011] of management positions⁴ and 21% of executive positions in the ICT sector [Digital Nova Scotia 2014]. Available data which compares national workforce demographics indicate the representation of women in ICT in Canada is lower than in Europe [European Commission 2012; Catalyst 2014a] but consistent with the United States [Catalyst 2014b]. In NS, as is the case throughout North America, the representation of women in the ICT sector is low for all positions as well as for senior positions.

2.1.3 The benefits of increased gender diversity in the ICT sector

As the transition to a knowledge-based economy continues around the world, regions with a technology savvy workforce enjoy stronger economic development. A study by Trauth et al. [2008] acknowledged the availability of human capital is one of the driving forces for economic development. Governments around the world are developing policy that acknowledges this perspective. Canada aims to be a leader in adopting and using new technological advancements [Industry Canada 2014].

¹ Number of persons of working age, ages 25 to 54.

² Number of persons who usually work 30 hours or more per week at their main or only job, ages 25 to 54.

³ National Occupation Classification (NOC) for ICT jobs as used by Digital Nova Scotia.

⁴ Ibid for NOC's with the term 'management.'

Nova Scotia's economic future is dependent on a renewed workforce and improved innovation [Ivany 2014]. Development of growth sectors, such as ICT, are strategic for the province [Nova Scotia Government 2013]. It makes sense then that women, who are an under-represented group in the ICT sector, are a largely untapped source of talent for the knowledge economy. Their increased participation in the ICT sector would be beneficial to the economic development of NS. There is also an argument for increasing workplace diversity defined more broadly than just gender. Diversity in the workplace refers to more than gender and generally includes differences in race ethnicity, disability, sexual orientation, and culture [Barak 1999]. It can also include characteristics like education, tenure, or marital status. There is a large and growing body of research on workplace diversity that identifies and supports its associated benefits [Scott et al. 2011; Anne 1998; Stevens et al. 2008]. Women make up more than half the population in Nova Scotia and yet are the most under-represented group in the ICT sector. It follows then that the benefits of workplace diversity could be better realized by first addressing the gender gap.

Over the past few years, the movement towards more diverse workplaces has been driven by a growing business case that highlights how organizational performance is enhanced through actions which promote workplace diversity. Studies [Bruckm et al. 2014; Martin-Alcazar et al. 2011; Richard and Johnson 2001; Spiers 2008; Scott et al. 2011] have shown improvement in bottom line financial results, decision quality, employee morale, customer satisfaction, and a range of other business measures which improve with increased diversity. Although this position is increasingly accepted, it is challenged by an alternative view that espouses a social justice motive for diversity. At the core, this social justice argument challenges the contingent nature of the business case for diversity as a 'fair weather' approach [Noon 2007] with a variable effect, depending on the business climate, and thus failing to address the core ongoing social issue of fairness and equity. The market economy in this context is not reliable in adequately and appropriately influencing under-represented groups, such as women. Other elements of the social justice diversity argument include how the business case for diversity is difficult to measure and how organizations are often very short-term focused [Noon 2007]. Notwithstanding, there is considerable momentum for the business case argument that is espoused by advocacy groups, such as Catalyst, as well as federal and provincial governments [Preville 2014].

In order to realize the benefits of diversity, the Nova Scotia ICT industry association, Digital Nova Scotia (DNS), together with its member organizations initiated a project to advance more women into senior ICT positions. Their approach intentionally targeted women in senior positions [Digital Nova Scotia 2014]. The lack of women in senior positions has been described as an "insidious barrier" [Cohen et al. 1998] to the advancement of women. The DNS approach of targeting senior women is consistent with this notion, as well as research [Kurtulus and Tomaskovic-Devey 2011] which suggests that increased representation of women at senior levels is associated with increased representation of women throughout the organization.

2.2 ICT Careers, and the Growing Discussion about Women in ICT

2.2.1 The changing nature of careers

The idea of what constitutes a career has changed considerably in the past fifty years. Careers are viewed today as either 'traditional linear' or the newer 'boundaryless' career [Joseph et al. 2012]. Edgar Schein, an accomplished scholar in the discipline of organizational and career theory, describes careers as processes which tie the individual and the organization together [Schein 1971]. A more contemporary definition is offered by [Dries 2011 p. 365] where she describes a career as "a series of more or less unpredictable experiences lived by individuals continually negotiating work and non-work aspects of their lives." Sullivan [1990] summarized the differences between these two career perspectives highlighting how the individual takes responsibility for career management in a

boundaryless model. In a traditional linear model, the organization was assumed to be responsible for career management. According to Sullivan, in a boundaryless career, skills are transferable where traditionally they are firm-specific and the employment relationship is much less based on job security in exchange for loyalty. It would seem that as careers have changed, they have become less predictable [Arthur et al. 2005].

It is generally accepted that careers have an internal and an external dimension. The external dimension relates to the career as perceived by others where the internal dimension relates to notions of self. It is evident from the volume of literature available that the external dimension gets the most attention [Ituma 2006] although increasingly research is focusing on the internal dimension. Post-industrial society has experienced changing notions of career success which has coincided with and may be influenced by a transition in values to a post-materialist view. An increased focus on self-expression values, subjective well-being, self-expression, and individual spirituality has emerged [Dries 2011]. These values differ across cultures but the transition to a post materialist view has been most evident in affluent societies, such as North America. This transition has challenged ideology, such as “the American dream” and its influence on notions of success. One particular area of scholarly attention is the influence of changing social values across cultures and perceptions of career success around the world [Dries 2011].

Schein offers a conceptual scheme for careers which seems to account for both the traditional and the newer career, as well as the internal and external dimensions. He suggests that a career can be described from three perspectives namely that of the individual, the organization, and the outside observer or that of society [Schein 1971]. Schein’s often cited career anchor model [1987] focuses on the internal dimension of career and defines career anchor as, “that one element in our self-concept that we will not give up, even when forced to make a difficult decision” [p. 158]. These anchors are said to influence individual career decisions. Schein’s original model was updated to account for emerging social values including service or dedication to a cause, pure challenge, and life style [Schein 1990]. Scholars have argued that Schein’s model, although updated, cannot account for individuals who have multiple careers [Ituma 2006] and moreover that individuals may have more than one career anchor which is in line with the work of Ginzberg and Baroudi [1992] who observe a dual career strategy among information technology (IT) workers. The nuances of a career in IT is the focus of the following discussion.

2.2.2 ICT careers are unique and sensitive to cultural context

The literature on the IT workforce typically treats them as a homogeneous group. Von Glinow [1988] indicated that high tech workers are unique with attitudes and values different from other workers. Her description focused on their technical training and strong professional identity as contributors to their uniqueness. Information technology workers have also been thought of as unique based on their relatively high levels of compensation [Colclough and Tolbert II 1992]. They tend to place high value on autonomy [Von Glinow 1988]. Typical IT personnel stereotypes [Lee 2002a] include the high maintenance worker who places significant demands on the employer including pay; the older static IT professional who is stuck in an original technology skillset and unwilling to develop new skills; and the technology anchored geek who defines themselves in terms of technology and is not people oriented. While some studies reflect on the unique nature of the typical IT worker others serve to highlight regional differences.

A wide range of IT worker and IT career related studies have been undertaken in countries including the United States, Taiwan, South Africa, China, the United Kingdom, and Canada [Ituma 2006; Lee 2002b; Enns et al. 2006; Igbaria et al. 1995; Igbaria and McCloskey 1996; Igbaria and Siegel 1992;

Ginzberg and Baroudi 1992; Aaltio and Huang 2007; Devine 1992]. A comprehensive review of these studies is beyond the scope of this paper however a common feature is that they are regionally situated and are sensitive to regional cultures. One example is the work of Ginzberg and Baroudi [1992] where they observed differences in career anchors in a quantitative study involving information systems (IS) personnel from across the United States (US) and Canada. Their findings suggest that career anchors are similar across IS workers but they noted an exception relative to the Canadian participants who reported a lower score for the job security anchor suggesting it is less important for them than other career anchors where it was more important for participants from other countries. Although this finding is potentially attributable to differences in the social security policies across the two countries it serves to underline the need for career related research to consider the local context. This conclusion is consistent with Hanappi-Egger [2012] who examined diversity management and recommended that future research focus on understanding the local culture or “habitus” [p. 149]. Other themes in IT personnel and IT career literature include the strategic importance of the IT workforce to economic development, shortages of IT workers, employee retention, diversity, and in particular, under-representation of women.

2.2.3 There is a considerable volume of research and an intensifying discussion about women in ICT

The Association of Computing Machinery (ACM) is a prominent computing society and has hosted meetings and conferences related to human resource management for IT professionals since the first ACM Special Interest Group (SIG) for Computing Personnel Research (CPR) was held in 1962. It is reasonable to use the topics discussed at ACM as an indication of prevailing issues for the IT community and a broad survey of the CPR topics discussed over the years provides some insight into the evolution of human resource management as it relates to the discipline of computer science. In a survey of ACM CPR SIG discussions, Niederman and Krasteva [2012] found that workforce diversity has emerged as a major topic. Although not on the CPR radar until recently workforce diversity including gender equity is now a hot topic. In each of the 5 years from 2007 to 2011 diversity and the cultural issues of the IT workforce were discussed. The only other topics discussed in each of those 5 years were the areas of careers, workforce education, and recruitment and retention. It is significant to note that while these other discussion topics were on the ACM CPR SIG agenda in the early years, between 1962 and 1969, the issue of workforce diversity was not.

It is clear that diversity is of interest to the IT sector as further evidenced by the existence of local ACM Women’s (ACM-W) Chapters and the preponderance of societies and committees dedicated to encouraging and supporting women in science and technology. Across Canada and in Nova Scotia there are a large number of such organizations, including Canadian Women in Technology (CanWIT), Women in Communications and Technology (WCT), Canadian Coalition of Women in Engineering Science Trades and Technology (CCWESTT), Society for Canadian Women in Science and Technology (SCWIST), Canadian Centre for Women in Science Engineering Trades and technology (WinSETT), Women in Science and Engineering (WISE), the Hypatia Association. Combining the ACM CPR agenda topics, the plethora of special interest groups, and the current wave of interest stemming from Facebook CEO Cheryl Sandberg’s movement targeted at women in technology (including her best-selling book *Lean In*), it would seem there is intense interest in addressing the ICT gender gap.

2.3 Barriers and Enablers to Advancement for Women

2.3.1 The Glass Ceiling Phenomenon

The term ‘glass ceiling’ generally refers to career advancement barriers for women and people of color [Baxter and Wright 2000; Morrison and Von Glinow 1990; Morrison et al. 1987]. The metaphor illustrates how women, or other under-represented groups, are able to look up and see career opportunities but are somehow unable to realize them because of an invisible barrier. The term first

appeared in an article by Hymowitz and Schellhardt [1986] and has since been commonly used in many contexts, including business, government, and academia. A significant volume of literature related to glass ceiling effects has emerged since the US Federal Government Glass Ceiling Commission [Jackson and O’Callaghan 2009] which described three types of barriers that are faced by women and people of color in top level management. The barriers explored by the Commission included societal barriers, referring to the availability and number of qualified individuals from under represented populations; internal structural barriers, referring to the lack of businesses programs involving outreach and development as well as non-inclusive corporate climates; and government barriers, referring to a lack of monitoring and enforcement [Jackson and O’Callaghan 2009]. The existence of a glass ceiling has been compared across nations including a quantitative study [Baxter and Wright 2000] which distinguishes between a gender authority gap and the mathematical probability of woman being promoted compared to men. The authors suggest that a statistically significant glass ceiling does not exist in the United States but does exist in Sweden and Australia. They argue that socio political considerations and varying degrees of government focus on antidiscrimination practices may be factors influencing the glass ceiling in these countries.

2.3.2 Barriers to Career Advancement for Women

Two broad categories of management theory can be used to explain the glass ceiling barrier these include institutional theories and social theories [Frankforter 1996]. Institutional theories focus on rules, policies and organization structures where the status quo maintains the power and dominance of white males. Social theories focus on cultural biases and gendered definitions of leadership which are masculine and require under-represented groups such as women in ICT to model these gendered characteristics in order to advance. Tripp-Knowles [1995] proposes a framework to understand the barriers and obstacles facing women in science addressing systems barriers, institutional barriers, interpersonal barriers, and self-barriers. She defends the notion that a “cumulative disadvantage” [p. 28] exists for women in science based on life experiences and the career obstacles which are encountered by them throughout their career beginning with early education. Her work is science-focused but the cumulative disadvantage is argued more broadly by others including Catalyst [Carter and Silva 2010a]. Since ICT is generally considered to be in the domain of science Tripp-Knowles’ work should align with ICT career experiences.

The notion of a “chilly climate” experienced by women in science academia and business is acknowledged and explored by several authors [Roldan 2004; NSERC 2010; McCord 2000; Morrison and Von Glinow 1990; Soe and Yakura 2008; Tripp-Knowles 1995]. The chilly climate is characterized as an institutional barrier in Tripp-Knowles’ framework and is described as unwelcoming cues which girls and women receive which can lead to a lack of confidence thus discouraging entry or advancement in science. Research also suggests women are less competitive than men [Cuddy et al. 2004; Joshi and Kuhn 2005; NSERC 2010]. Differences in women’s value systems and their predisposition to collaboration and relationships [Sumner and Werner 2001; Latrese Page 2005; A. H. Eagly and Karau 2002] as well as women’s self-perceptions that they lack assertiveness [Fels 2004] are additional examples of self-barriers. Similarly, research has shown that women underestimate their abilities while men overestimate theirs. For example men were found to apply for a promotion when they met half of the job qualifications where women only applied when they met all the qualifications [Kay and Shipman 2014]. Examples of systems level barriers would include compensation gaps between men and women where women are paid less than men for comparable work and skill [Carter and Silva 2010b] as well as the barrier of reduced access to social networks [Morgan and Trauth 2006] for women, commonly referred to as ‘the old boys club.’ Work-family balance where women are seen to take responsibility for a greater level of household responsibilities than men regardless of how many hours they work outside the home [Linehan and Walsh 2000; Allen

and Russell 1999; Williams et al. 2006; Fels 2004; Riemenschneider et al. 2006; Cuddy et al. 2004] would also line up with Tripp-Knowles' institutional level barriers. The masculinity of leadership roles where people generally associate notions of leadership with male terms [A. Eagly and Karau 2002] is often combined with the idea that women over compensate for this disadvantage [Ibarra et al. 2013] finding themselves in a "double bind" [p.7] because in acting like a man they appear arrogant or abrasive where failing to do so makes them appear weak or overly emotional.

2.3.3 Enablers of Diversity and Career Advancement of Women

Studies have identified a wide range of conditions or actions which enable the career advancement of women and other under-represented groups. These were mostly found in human resource management related literature. This preliminary study is part of a larger study targeted at organizations thus the following discussion focuses on institutional level enablers of diversity and describe conditions or actions which minimize barriers to career advancement for individuals by maximizing diversity. These organizational level enablers include: integrating diversity across the organization [Scott et al. 2011; Evans 2012; Hunt 2007]; developing diversity related mission statements; more inclusive management structures and processes [Hanappi-Egger 2006; Hanappi-Egger 2012]; diversity incorporated in organizational values [Scott et al. 2011]; measurement of diversity relative to organizational targets; leadership commitment to diversity [Evans 2012]; and including strong messages about inclusion from top management [Barak 1999]. Other enablers of diversity identified in the literature include mentoring programs [Adya and Cotton 2012; Carter and Silva 2010a; Barak 1999]; compensation practices which are fair [Martín-Alcázar et al. 2011]; performance management and assessment which accounts for diversity [Martín-Alcázar et al. 2011; Hunt 2007]; recruitment practices which are more inclusive; the use of competency frameworks which emphasize softer skills; changing the language of job advertisements; diversity committees and task forces; flexible working hours [Evans 2012]; and increasing gender competencies of managers [Hanappi-Egger 2012].

Moving from the organizational level to that of the individual a number of personal strategies which enable women to advance their careers are found in popular literature and scholarly journals. In a recently published longitudinal study [Carter and Silva 2011] the following career advancement enablers for women were identified: getting trained through experience; gaining access to power; making achievements visible; blurring work life boundaries; getting formal training; career planning; seeking advice; and scanning opportunities inside and outside the organization.

2.4 Literature Review Summary

Women are under-represented at senior levels in business and across the ICT sector [Helfat et al. 2014; Digital Nova Scotia 2014]. Nova Scotia is no exception to this phenomenon and the province risks forgoing an economic development opportunity if under-representation of women in the ICT sector persists [Trauth et al. 2008; Ivany 2014]. Increasing the representation of women at the highest levels is one way to influence the representation of women at lower levels and across the ICT sector [Kurtulus and Tomaskovic-Devey 2011]. Relationships between individuals and the organizations where they work are the basis of careers. They are socially constructed, multidimensional and can be viewed from personal, organizational, and societal perspectives [Schein 1971]. ICT careers are unique and need to be studied in cultural contexts [Hanappi-Egger 2012] in order to be understood. The glass ceiling phenomenon where women encounter invisible barriers at progressively higher levels in organizations is described in many studies. Diversity related practices which organizations can consider to advance more women and personal strategies for individual women to advance their careers are also well documented.

There is a strong movement underway in business to understand the under-representation of women at senior levels and minimize the gap, especially in ICT. Gaining insight into the career experiences of senior female executives in the Nova Scotia ICT industry is an important step towards achieving change in the province.

3. METHODOLOGY

3.1 Case Study

Career experiences are individual and complex [Arthur et al. 1989], as are the organizations and the individuals who lead them. The plethora of research available about the lack of women in ICT and the slow pace at which women's participation has increased also suggest the problem is complex. Rather than seeking to explain the problem at a theoretical level, the researcher ultimately seeks to understand the problem in the Nova Scotia context, so that individuals and organizations might begin to solve the problem and help more women advance into senior positions.

The essence of a case study is to “illuminate” decisions, the reason for them, and the result of those decisions in context [Yin 2014 p. 15]. Case study explores “what can be learned *here* that a reader needs to know” [Stake 2006 p. 11]. In the present study, a case embodies the career of each interview participant – the senior executive women. The intent of this initial research is to gain an understanding of the careers of senior executives in NS instead of establishing causal relationships. Case study, as a methodology, is attentive to the local situation and suits the provincial focus of the study. It allows for the inclusion of different data sources [Creswell 2013] which is important because of the emergent nature of the research. A comparative case study methodology was chosen for the larger study because it allows for analysis of individual careers, as well as analysis between male and female participants. It further allows for cross comparison with non-Nova Scotia men and women. The larger study includes 4 participant groups, broadly using the sampling approach (as will be described) for “senior ICT executive.” The groups are: Nova Scotia female executives, Nova Scotia male executives, non-Nova Scotia female executives, and non-Nova Scotia male executives. Comparing case studies is suitable for a collection of cases illuminating the phenomenon [Stake 2006], in this case the barriers and enablers to career advancement for women in the Nova Scotia ICT sector.

The decision to limit the preliminary study to include only interviews with women as data sources was based primarily on the preference of the sponsor and time constraints. What follows is a discussion of data collection, including the recruitment of participants (cases), the approach to interviews, and then subsequently a description of data analysis including coding and thematic analysis methods.

3.2 Data Collection

A total of six female executives were recruited from the largest ICT employers in NS. Selection criteria focused on women currently employed in the ICT sector who at one point in their career had 50 or more employees reporting to them in NS for at least five years. Executives were selected based on the intention of the study to influence the advancement of women. Larger organizations have greater potential to advance larger numbers of women since they employ more senior managers and executives. Based on extrapolation of NS ICT sector demographics the overall population of women currently in these senior executive positions was estimated roughly to be in the range of 50 people. Given this low number purposeful snowball sampling techniques were used to identify candidates leveraging input from the sponsor and relationships enjoyed by the researcher who has occupied senior leadership positions in the NS ICT sector for many years.

The following table describes the participants along with selected information which is expected to be used in the larger study and is offered here for additional context.

Table 1: Overview of Study Participants

Current Generic Title	Current # Reports	Most Senior NS Generic Title	NS # Reports	Regions Lived & Worked	General Education & Designations	Region of Birth	Marital Status	Children	Age
General Manager	50	General Manager	50	Atlantic Canada Canada Europe	Professional Designation Masters - Computer Science Masters - Other Science Bachelor - Other Science	Europe	Married	Yes	45
Vice President	70	Vice President	50	Atlantic Canada Canada Europe USA	Bachelor - Applied Arts Bachelor - Other Arts	Atlantic Canada	Married	Yes	39
Vice President	42*	Director	5*	Atlantic Canada USA	Bachelor - Business	Canada	Single	No	52
Executive Vice President	300	Executive Vice President	300	Atlantic Canada	Bachelor - Business	Atlantic Canada	Married	Yes	
Chief Information Officer	110	Chief Information Officer	110	Atlantic Canada	Bachelor - Arts Masters - Other Science	Canada	Married	No	50
Vice President	40	Chief Technology Officer	90	Atlantic Canada Canada	Masters - Business Professional Designation Bachelor - Other Science Bachelor - Other Science	USA	Married	Yes	55

Note 1: Title and Education have been made generic to maximize anonymity.
 Note 2: Current and NS # of Reports refer to the number of employees directly reporting to the participant now and when they last worked in Nova Scotia.
 Note 3*: This participant had a large number of indirect reports which justified inclusion in the study notwithstanding the minimum criteria of 50 reports.

Candidates were approached by telephone and email and they subsequently provided consent to participate based on a protocol approved by the Research Ethics Board. Semi-structured interviews were conducted by telephone since some of the participants were no longer living in NS. Interviews took place over a 14 week period. In general the participants were asked to describe their careers, including barriers and enablers to their career advancement. Semi-structured interviews were used because of the rich detail such conversations can provide [Hoopes 1979]. The interview guide included broad questions ranging from “Please describe your career,” to more focused questions like, “Please describe any barriers to career advancement you experienced,” or “What are you most proud of about your career?” Career documentation including curriculum vitae and on-line ‘Linked In’ profiles provided by participants were used to confirm dates, titles, and company names. Interview audio recordings were transcribed.

Through both the present preliminary study and the larger study, the interviewer-researcher seeks to enable change in management practice which might advance the careers of more women in the Nova Scotia ICT sector. His status as an insider brings risks and benefits to the methodology and the interviews. On the one hand, as an insider, there is both a greater likelihood of an effective interview and a greater opportunity to credibly communicate the results thus serving the intended purpose which is more than just academic [Olson, K., Shopes 1991 p 201]. On the other hand there is the potential for bias through remarks or intonation which can distort the stories as told in the interviews [Cutter 1996]. This risk of bias is amplified in the case of interviews with women since the researcher-interviewer is a man. In light of this potential for bias, care was taken such that the interviewer’s reaction to answers was neutral while at the same time being a natural question response sequence [Mintz 1996]. If the response offered by the participant was expressed with dismay, the interviewer response (if any) was muted dismay. This way the participant was not led by the interviewer. A range of response testing strategies were applied in the interview including substitution of incongruent alternatives such as asking if the participant ever experienced the opposite of elements from their

account and testing by reference to hypothetical situations [Mintz 1996] whereby participants were asked the same question in relation to their personal experience as well as their observation of the experiences of others. These testing techniques served to both validate and gain further insight about the accounts provided.

A career profile narrative in the range of 10 pages for each participant was developed by the researcher using the interview transcript and the participant's resume or LinkedIn documentation. The career profile was developed based on themes which emerged from the individual transcript as is described in the next section. A second round of interviews with each participant served to validate the first draft career profile through member checking. Participants were provided a copy of the first draft career profile before the second interview and were asked during the second interview to correct any errors, or add content they felt was missing. A table entry for each participant showing categorical data, for use in case analysis as part of the broader study, was also checked at this stage (see Table 1). In some cases participants provided feedback through e-mail before the 2nd interview, typically offering date or spelling related corrections. Generally participants were very positive about the first draft career profile. No significant additions were offered. In a few cases quotes used in the first draft career profiles were slightly 'softened' such that they became more generic. This was likely requested by participant to increase anonymity. None of the participants asked for quotes or themes to be deleted and no additions were offered. The researcher did not feel pressure from participants to censor the data [Bradshaw 2001]. The interviewer probed gaps in the career timeline in one case. The bulk of the second interviews explored how participants felt after reading their career profile. This was intended to understand how participants perceived success and advancement.

3.3 Data Analysis

Each individual interview was audio recorded, transcribed and imported into NVivo wherein it was reviewed in detail. Thematic analysis looks across data to find patterns and meaning. Thematic analysis at the semantic level looks primarily at the data as presented where the latent level looks beyond the data and is more focused on interpretation and bringing meaning to the data [Braun, V., Clarke 2006]. Coding is an aspect of analysis where data is explored, labeled, and linked in a cyclical manner [Saldana 2008]. For this preliminary exploratory study, semantic analysis was chosen because of its flexibility and simplicity. Data was coded and thematic analysis was undertaken following a five step procedure including an initial review with preliminary coding; identification of patterns and combining of preliminary codes; a second round of coding following the establishment of condensed codes; identification or over-arching themes; and connecting themes into a story which informed the research questions. Thus there were two rounds of coding for the first interviews. Coding was done in Nvivo in the sequence that the interviews and transcripts were completed. Research journal notes were also captured both in NVivo and on paper. An initial test interview and first coding cycle was completed with the President of the study sponsor organization who did not meet the study selection criteria but who otherwise would be representative of the target group. This test interview and the intention of the study served to establish initial top level coding structure including barriers to career advancement, enablers of career advancement, and other comments which generally included career milestones and comments which did not relate to barriers or enablers specifically.

A second level structure was used from the outset in order to broadly align with Schein's career and organizational model [Schein 1971]. Accordingly passages were also coded as relating to one of three sub categories, namely personal, organizational, or societal. This model seemed sufficiently general so as not to presume a focus for the study, which is intentionally exploratory, while at the same time offering some useful action oriented categorization. These three groupings arguably represent audiences to whom findings and resulting action to increase the representation of women at senior

levels might be directed. In general when the comment related to influences of a colleague, manager, or business practice it was coded as organizational. Specific references to community, industry association, or broad influences were coded as societal. Other comments, in particular attitudes, beliefs, or experiences were generally coded as personal. These criteria were applied to coding both enablers and barriers. Where the tone and/or content of the comment was negative it was coded as a barrier whereas positive comments were coded as enablers. As interviews were completed, each was coded based on the hierarchy as described. This produced approximately 200 different codes ranging from “I took a new job” to “I had great male mentors” to “I was held back from promotion.” A second coding cycle was undertaken after grouping codes into approximately 80 condensed codes. In this second cycle the code examples provided previously would have rolled up into “career milestone” and “mentoring” and “promotion practices.” Preliminary coding from the first cycle was reviewed and revised mostly to reduce the data producing a more condensed coding structure. In this sense, coding was considered a heuristic and was cyclical. The data was coded and informed subsequent re-coding [Saldana 2008]. The choice to use only two coding cycles was based on time constraints and in consideration of the intention to pursue the third and subsequent coding cycles after initiating interviews with the male participants as part of the larger study.

Analysis and development of the individual career profiles for each of the participants was done sequentially as the interviews occurred, roughly within 2-4 weeks of the first interview. Procedures from both case study and narrative inquiry were followed whereby the story was placed in chronological order [Creswell 2013]. The researcher was careful to exclude names of individuals or companies to which the participant might have made reference in the interview. The resulting narrative described career milestones, barriers and enablers to advancement, influential management practices, and feelings about the individual career experience. Thus the interview served as an oral history of the individual’s career in that it provided a detailed account [Hoopes 1979]. Themes and patterns emerged based on interpretation of the coded first interview through both coding cycles. Generally themes were identified where experiences or accounts were similar and were repeated frequently or seemed to be spoken with the most intensity. Each career profile included a selection of quotations which were representative of the themes developed. Accuracy of the career profile, including the selected quotations, was improved through member checking by participants during the second interviews. As a final step in the analysis, themes from the interview data were examined to identify patterns which informed the research questions. Supporting quotations from a range of participants were selected in order to illustrate the themes for the benefit of the reader.

4. DISCUSSION OF FINDINGS FROM THE PRELIMINARY STUDY

A summary of interview themes about the career experiences as well as barriers and enablers to advancement is offered in the following figure. Each theme is represented in the figure by a key word or phrase which is then described including selected quotations from participants thus the figure serves as a summary of themes. As described in the previous section (see data analysis), themes which were not specifically identified as barriers or enablers are categorized as career experiences. These are discussed first. Barriers and enablers are then discussed following the personal, organizational, and societal categories borrowing from Schein’s career and organizational model [1971]. In general the women interviewed described a similar number of career advancement enablers and barriers. Based on a high level analysis, the length of time and the intensity of the discussion were similar for both barriers and enablers. Interestingly, barriers identified by women were mostly at the organizational level where enablers were mostly at the personal level. In general, barriers and enablers identified by the women interviewed are consistent with those found in the literature as described previously. No barriers or enablers were identified which might be unique to Nova Scotia ICT executive women. Similarly no barriers or enablers common in the literature were absent from

the interviews. It would seem that the barriers and enablers to career advancement for executive women in Nova Scotia are consistent with the significant volume of literature related to the glass ceiling phenomenon. The purpose of this preliminary study was to explore the career experiences of these women thus the summary interview themes and the corresponding descriptions which follow are central to this paper. The description of themes begins with career experiences followed by barriers and then enablers both of which progress from the personal, to organizational, to societal levels.

Figure 1: Summary of Interview Themes

Career Experiences			
Positive Lucky Impactful Lacking balance Did it my way			
	Barriers	Enablers	
Personal	Self-doubt Lack of assertiveness Balancing work and family	Determination Self-promotion Accepting the bitch label Networking Willingness to travel	Personal
Organization	Male dominated workforce IT culture chilly to women Compensation gaps Informal male social networks Women criticized for behaving like men Maternity leave	Stretch assignments Sponsorship Accountability for gender balance	Organization
Society	Male female stereotypes	Family support Changing social values	Society

4.1 Career Experiences

The career experiences as reported by the women interviewed were generally described as **positive** which, based on candidate selection criteria, might be expected from executives who have achieved what is arguably a high level of success. None of the participants described their overall career experience as negative. On balance they described a smooth progression.

“I’m really satisfied with my career because I think that I moved, ah and I have the feeling that I moved very smoothly without any fight or without setbacks. I manage a company. My President trusts me, so I’m pretty free and I can do almost whatever I want. So yes, I feel very satisfied by where I am right now.”

A theme which might be less expected from systems professionals whose work requires careful planning is the frequency with which participants described a largely unplanned career where **luck** was often referenced to explain the positive career outcomes which they reported.

“I stumble (in describing my career) because I don’t really think about my career. Like I never sat down and said, ‘Okay, this is what I want my career to be or this is

where I want to go. I've never had that plan, right? So I'm not trying to be naive and it's not that I don't recognize that I've had a career but that just makes it sound, to me, very planned and you know, it was not that planned."

Participants often described career satisfaction from their work as relating directly to the benefits realized by the users of the technologies and solutions which they contributed to delivering. They described careers which were customer focused where their work was **impactful**.

"Oh, I think I've had a great one (career). I have had the luck of being able to do some really cool and interesting things that have actually helped change what goes on with health IT in this country, so I feel like I've had an impact."

Generally, career regrets were described as missed opportunities of a short term or longer term nature. Sometimes participants described a promotion which was blocked, a lost job competition, or an unresolved compensation gap. But generally career regrets were described in relation to longer term outcomes arising from a series of decisions made by the participants, the most common of which was related to a **lack of work life balance**.

"(I regret) not better balancing my personal life and my career. Being as driven as I was in my early days and not respecting the importance of relationships, not just my personal relationships but my business relationships. I wish that maturity and that wisdom had come earlier but we all have to grow up and we all have to learn, so unfortunately I learned it the hard way."

Participants described their career and their lives with a modest measure of pride and a sense of accomplishment. A tone of integrity was evident in many of the career accounts where the participants were not boastful and felt satisfaction because "**I did it my way**."

"A friend of mine recently said, '(MS), you are the same person at home that you are at work and you should never change that. I'm very proud that's recognized because my integrity and who I am and what I stand for principally and what I believe to be the best way to live your life (is important). I haven't compromised my personal integrity to get where I am."

4.2 Barriers and Enablers to Career Advancement

4.2.1 Barriers

Self-doubt and a lack of confidence or assertiveness were cited as barriers in many of the interviews. Most of the accounts seemed to reflect on these as barriers that had (eventually) been overcome but were still a work in progress. In these cases, confidence, assertiveness, and the willingness to be seen as a "bitch" were cited as enablers (see enablers). The women described both their lack of confidence and **failing to assert** themselves as barriers.

"Another thing that was a barrier for me, and I know it's a barrier for a lot of women, is the voice of doubt inside the mind. 'I'm not going to fit in. I'm not going to be smart enough. I'm not going to ever rise to the challenge. I shouldn't put my hat in the ring.' All of that stuff. Even when women 'make it,' they still talk about it and I know. I've had this needling kind of feeling, this voice of self-doubt that you have to know how to tame because it's there and it is a huge barrier."

“I didn't feel that I had a lot of leverage but I probably did and I should have asked for something and I didn't. And I think that would have put me in a better light of, 'No. She's, she's got some moxy,' right? But instead I sat back and I took it. So I think that was a setback in terms of moving my career forward.”

Although the general theme of lacking balance was described as a common career experience, there were frequent references to **balancing family and work** responsibilities specifically as a barrier, especially among the four participants who were mothers. Like self-doubt these barriers were seen to have been overcome but references were made to the challenges faced by women colleagues and barriers they faced in maintaining work and family balance.

“I have seen brilliant women just leave the workforce completely, regardless of where they were in their career, when they had kids. Some (left) due to personal choice, which is great. But some did it as a result of not seeing another option which are the ones that break my heart because they're just not supported in a way that allows them to see how it's possible and that support needs to come from the organization that they're with and from home.”

Not surprisingly, consistent with industry sector workforce demographics, women reported an ICT work environment which is **dominated by men**, where the organizational culture was generally not welcoming to women. The lack of demographic balance was described as a barrier which impacted hiring and promotion decisions. Cultures were described as ranging from “not very diplomatic” to outright cold. The mid-range of this spectrum might be described as a **chilly climate** in the same way as it has been described in some of the literature [Roldan 2004]. Compensation gaps where men earn more than women were described as barriers in a few cases including one case where the women executive interviewed felt so strongly about these gaps that she was openly advising women in her organization to pursue jobs at other companies in order to get a pay raise.

“There's inequity across compensation in terms of skills and value for a job. I'll say that it's probably biggest with internal progression versus external hires. So again, (that's) why I encourage women, if they're looking for higher careers and higher pay, you've got to leave.”

Barriers were often described as relating to **informal social networks** where men build more and stronger relationships with other men who can influence their career advancement. Participating in golf, hockey, drinking, and other social events were frequently and emotionally described as male oriented where participation by women was limited and a significant barrier to career advancement. Women are often excluded from these networks and as a result are exposed to fewer opportunities [Trauth & Morgan 2006].

“Who gets invited to go play a round of golf or hang out with the other managers or you know, it then snowballs, 'Oh, well it's just because we're friends.' Well, it's because you're just friends because you started going out for beers with them back when they worked with you. That's where it started. I get today, ten years later, you're just friends and you go and do this, I do, but it started because they worked for you and it was Friday and you were done working on that proposal and you went out to grab a beer and that was okay but it wasn't okay for me to go because that made it different. So I think then, you feel like the odd man out in the office. Today, I wouldn't have the same relationship throughout the community that some

of those other guys do. So it's, you know, I think that sometimes, and at the time I probably would have thought it was short term, well, what do I care if I go to have a beer with him at this point in time. But now looking at it also ten years later, I'm like, yeah, it matters because they're connected, because they play hockey and they go golfing and they, you know, whatever. And I have a couple women (colleagues like that) but it's not the same, right? Just because of the quantities, the numbers, that you can't have the same networks.”

The same participant later went on to describe a particularly powerful moment in her career related to the influence of social networks and how difficult it can be for women to get “inside.” Her account is supported by what another participant described as how organizations can be “oblivious to women.”

“I was pregnant, I was tired and a little out of my element, um and I get there and a lot of these guys have been working together for a long time and when they finished the business portion, if you will, of the meeting and it's maybe 8 o'clock at night or something and that's done and then all of a sudden they slam a bottle of tequila and a bottle of Rye or something on the table and then the meeting's about to start, really. Like they're really going to start having conversations now, so you have to make some choices. You are an absolute fish out of water in that room at that moment. It's not like they're telling you (that) you have to leave. It's not like I'm being escorted out of the room but it's not a comfortable space.”

The women interviewed described how sometimes they perceived that they (or other women they had observed) were **criticized for behaving like a man**. There is an implied social construction of what it means to be a man and what is expected of men and women (see male female stereotypes). The ability to accept this criticism and persevere despite it was described as an enabler (see enablers) they nonetheless described the phenomenon as a barrier to be overcome. This phenomenon could arguably be categorized as organizational and/or societal in relation to the Schein model. It can also be related to the previously described lack of (natural) assertiveness barrier described by these women since assertiveness is arguably a characteristic expected of men more so than women and women are expected to be more gentle [Ibarra et al. 2013]. In attempting to overcome this barrier and be more assertive these women are criticized for not maintaining their expected womanly nature. This is sometimes referenced in literature as the double bind [Ibarra et al. 2013] where women are required to assert themselves in a manner which is seen to be man-like but they are unduly (and unfairly) characterized more negatively than men for being overly aggressive or bitchy. Accepting the bitch label was also a theme (see enablers).

“Women tend to be more discreet and that's probably why they had more trouble, that's probably where there was some barriers because when you have a woman who doesn't behave like the others, people would say that she behaves like a man, so she's not a good woman, do you know what I mean?”

Maternity leave was described by some of the participants as a career risk and barrier. They expressed fear that they were stepping away from their career and would miss out on opportunities. One participant described maternity leave and support from the organization as an enabler. Support from family was cited as an enabler in all cases (see enablers). In one case, emotionally charged references were made to pregnancy at work and maternity leave as a barrier.

“I think when you take a full year off, people forget about you. It's not that they mean to, it just happens and I think that can be a barrier for some women. I have

two children and I was passed up for promotion because I was a young mother and I was on maternity leave for a total of six weeks and I was told that, you know, 'It's too bad you're on maternity leave' and that is a true story."

Frequently, the women interviewed made comments about **male female stereotypes**. As one participant stated, "management barriers are really breaking molds and giving women a real chance." Some of these stereotypes included women being criticized for behaving like men and in some cases rumors of sexual relationships outside the workplace when women tried to develop professional relationships with men. A secondary theme of women being stereotyped as overly emotional in the workplace also emerged from the interviews.

"There were many references to, 'That cute little one' and then them finally figuring out that no, that was 'The engineering somebody.' Sometimes you just have to ignore it and I've seen that a fair amount. You can chose to let it drive you crazy or you can just choose to ignore it."

"There is a stereotypical response for a woman when she gets upset that there will be tears and that can be considered emotional but a man yelling and perhaps slamming a fist on a table is seen as what? Not emotional? It seems to me to be just as emotion, it's a different emotion but it's just as emotional but it's that, 'Oh, she's too emotional.'

4.2.2 Enablers

In describing their careers, the women interviewed expressed satisfaction in their accomplishments (see career experiences) and often attributed their success and resulting career advancement to a strong work ethic and notions of drive, persistence, and **determination**. In all cases, even where the participant described themselves in the most humble of terms, there was recognition of how determination enabled their career advancement.

"I get things done. That is my biggest strength. No matter what it takes, no matter if I know from the start how to do it or not, if I have something to do, I'll do it. It's often behind the scenes as I don't claim out loud everything I do or did. But if I say I'll do it, then I do it."

"I would not have the job I have today if at several points in time I didn't take on something that I had never done before with the confidence in my ability to figure it out or get the right people around the table or stay up enough hours or whatever it is, but I would get it done."

In general the women interviewed described the need to speak up for themselves so they can be better known. They also described situations they observed where other women failed to speak up for themselves which resulted in lost career opportunities. There were a range of experiences and perspectives relating to concepts of **self-promotion** but in general the women described it as a necessary enabler and typically related to the lack of assertiveness barrier which had been overcome.

"You need to let people know, if it's not obvious, that you're doing these things. So you need to be a self-promoter and then you need to have others talking about you as well. Others will talk about you when they know what you're doing and that you're doing it in alignment with what they're looking for."

Reflecting back to the earlier discussion in this paper about confidence and the double bind phenomenon women described being aggressive and the willingness to be seen as a bitch as enablers to career advancement. The tone of the comments about aggressiveness reflected a reluctance to embrace it, possibly because it did not come naturally to them. Sometimes they took care to choose between words like 'aggressive' and 'assertive' but in most cases there was acknowledgement that accepting the consequences of what could be seen as unpopular but necessary decisions contributed to results which enabled career advancement. Their accounts included many references to **accepting the bitch label**.

"You really can't mind being called a bitch because you need to take things. They're not going to be given to you and that's not going to make everybody happy all the time and I think at the end of the day you have to be confident enough in yourself and confident enough in your decision making criteria that it doesn't matter."

"She was not quiet and discreet at all. She was the kind of woman when she had something to say, she would say it out loud, no matter who she was with, so that probably blocked her for some positions later on. She was the kind of woman when there was a problem, some people would fear to talk to her but she was able to take a decision very quickly and very smart and wise decisions and, she was able to (gather) all of the information, the essential information to make the right decision at the time."

In almost all cases, women described their ability to network as a career advancement enabler. Sometimes they described how challenging **networking** could be for women relative to men (see barriers), however without exception they acknowledged relationships they had cultivated as enablers of their career advancement.

"I was really late to the game in learning how to network and how to connect, you know, in the States more so than Canada. If I look at Canada in my history, it was a little bit of you know, the rock stars really shone and the rock stars got the opportunity. Um, and maybe back then I was a little naive to understand the connection part of it, right? Um, but you know, the problem in Canada was that there was only so many seats at the table, right? So I learned more when I went to the States (and saw) the power of connection and the power of association and how networking is extremely important and an enabler."

"I'm trying to stress with my kids, they keep saying, 'How do you find jobs?' And I'm always telling them, 'It's never the place you think you're going to find it.' Every single job I had was not a posted job. Every single one has been one that I haven't applied for. It's been one that has come through networking and relationships and I think lots of people miss that and I didn't do it deliberately. It's just because I was doing things that I enjoyed doing, bumped into people who said, 'Hmmm, you know, I think I have something you might be interested in' and off we'd go."

Many women interviewed described a **willingness to travel** as a career enabler. Many of the stories shared about career milestones involved airports and flying, often to other countries. This was frequently described in the context of career opportunities or **stretch assignments** that pushed women beyond what they or others perceived as their career comfort zone. Categorized as an

organizational level enabler, these stretch assignments often included international postings or at least long term commuting within Canada.

“You know, Sheryl Sandberg talks about it and it is absolutely true, how many wives go home and tell their husband they're going to move to Europe for an indefinite period of time.” (And later...) “I would be learning an immense amount. I'd be learning about international business, I'd be learning about another side of the IT industry. I would be learning about myself and how I could survive the culture shock and all the different cultures and countries and labour realities and employment laws.”

One of the most common and powerful themes which emerged from all the interviews was that of mentorship and **sponsorship** as an enabler, typically where senior executive men became an advocate for the woman when she was a mid-level manager. While all of the women interviewed described mentors who had offered them advice and support at various stages of their career, the strongest and most emotionally charged accounts were of men executives who actively campaigned for the advancement of the women interviewed.

“These are people who took a vested interest in young talent and it wasn't just (me) by the way, you know they were doing this everywhere. This was a calling for them almost and a mission for them, that they truly made it their focus to offer repeated development opportunities, exposure opportunities, and they continue to do it...The sponsor is the person who walks in the room and pounds a fist and says, 'No, we're not putting him in the job, we're putting her in the job and this is why we're putting her in the job and we're going to take a bet on her.' That's the sponsor.”

Two of the women interviewed made reference to an organizational level enabler where gender diversity was made a clear performance objective of at least one senior executive such that gender representation targets were set and monitored by the organization. This theme of **accountability** was present in other interviews but more oriented towards the theme of sponsorship where individuals within the organization became champions of individual women without a formal organizational structure or measurement system.

In most cases, especially, where the women were mothers, **family support** was described as a significant enabler. The need to balance work and family was a key overall theme of the stories shared by these women (see career experiences). Support from family in maintaining a reasonable balance was commonly referenced. Personal experiences of positive family support were described as an enabler and in a few cases the women offered observations of other women who did not have family support as a barrier. Family support was a strong theme across most parts of most interviews and often included a reference to **changing social values**. They described how male female stereotypes had changed and generally spoke optimistically about progress in how women were perceived in the workplace and role reversed families were generally accepted or at least getting there.

“I needed more support from my spouse than I think most men assume, right? This was a joint decision with (him) that we were going to have kids and I was going to keep going and we both recognized that meant that he had to pick up a lot at home.”

“Of course, my children have grown up thinking that it's normal for mum to go to the airport and dad to stay home, and to live in two places or more because when

they were little, they used to fly all over the place. So they flew more by the time they were six or eight than most people fly in a lifetime. Grade 9, Take your Daughter to Work Day was get in a plane, fly (from Halifax) to Toronto, go to the Data Centre with her mother. Get in the plane. Fly home. And the teacher said to her the next day, 'Where were you?' 'I went to my mother's work.' 'Where does your mother work?' 'Ah, in Toronto!'"

"When I'd get frustrated and I'd say, 'Oh my God, this is driving me crazy. You know, I can't believe I'm still seeing the gender bias. This should have all gone away.' And he'd go, 'Oh my God, sweetie, your job here is to make sure it's better for your daughter. That's all you need to worry about. People aren't going to be able to change because you want them to change. You change things by generation and you stick to your principles."

5. CLOSING REMARKS

5.1 Conclusions

The glass ceiling phenomenon is well documented describing how the ICT sector is male dominated and chilly towards women. Diversity management practices which might help create a more welcoming and inclusive environment are also well documented. The potential benefits from increased representation of women in the ICT sector are understood to be significant for organizations, the ICT sector as a whole and regional economic development. Synthesis of themes from the interviews created a glimpse of the experiences of women in executive positions in the NS ICT sector including barriers and enablers to career advancement. No new barriers, or enablers were described by these women relative to the literature reviewed nor were any expected as the study is preliminary and exploratory, anticipating a larger case study. Based on this preliminary study female ICT executives in the NS context have had career experiences and encountered barriers and enablers to career advancement which are similar to those described in other studies.

The findings from this study describe a cohort of female ICT executives who are generally happy with their careers. Many identified having to make sacrifices by balancing their lives more towards their career advancement than other areas of their lives. All of the participants considered themselves fortunate and celebrated the opportunity they have had to make an impact in the world through the application of the ICT solutions they helped to deliver. They described their careers providing evidence that they are a determined group who pushed through internal self-doubt and stood out in what was often a male dominated environment unwelcoming to women. Despite generally lower compensation than their men counterparts and with a more limited social network, they accepted stereotypes which worked against them including sometimes being labeled as a bitch. They followed the work wherever it took them in the world pursuing stretch assignments, so they could continue to advance and make a difference. They expressed gratitude for their sponsors and spouses who advocated for their success and supported them formally and informally. The families of these women offered them critically important support which helped them to advance. They shared their stories willingly and expressed hope that in future more ICT women like them will encounter fewer barriers to career advancement and have a greater opportunity to make an impact on the world.

This study has served to provide a local context for the ongoing discussion about the under representation of women at senior levels in ICT. A light has been shone on the local situation and as per Stake[2006] the case has been illuminated. The cross case study which is intended to follow will shine the light more broadly potentially highlighting issues and opportunities which are unique to NS.

Should there be no new or unique findings from the larger cross case analysis, at a minimum it would have contributed to strengthening knowledge about the situation in a local context as this preliminary study has done.

5.2 Study Shortcomings

Shortcomings of this preliminary study include potential participant predispositions about the topic of inquiry, and generalizability. Participants may have had varying degrees of exposure to news reports or may have participated in women-in-technology special interest groups and as a result could be predisposed to (for example) speak strongly about career barriers for women. Two of the participants were involved in a related Digital Nova Scotia workshop and two others acknowledged they had a personal interest in the topic. The effect of this potential confound would likely be minimal since the interviews were intended to explore the participant's career experiences, including such exposures. The larger case study should consider this influence and collect related data by asking participants about their predispositions to the topic and, when appropriate, including this as data in the cross case analysis. An additional shortcoming relates to the generalizability of findings which given a small sample size could be challenged, especially by readers with a positivist orientation. This preliminary study applied case analysis in anticipation of a more broad study with a larger sample size. Notwithstanding this expectation and the future generalizability it is expected to achieve, the present study also applied elements of narrative analysis which sometimes uses sample sizes of one and does not seek to be generalizable. In this way, the present study is intended to bring voice to the experiences of these women and explore the topic from each of their individual perspectives as well as their collective perspective. In this sense it does not seek to be broadly generalizable in its preliminary state. The larger case study will include a sample of men and women from NS and other regions. The cross-comparison of multiple groups will help make the findings more generalizable.

5.3 Next Steps

As the larger case study approaches, the researcher is aware of the following improvements to be incorporated in the research design based on the learnings from this preliminary work. These include: consideration for participant predispositions to the topic, the application of more robust cross case analysis techniques, a larger sample size, and practicality considerations which require revisions to the Consent Form and Research Ethics application. These improvements have all been referenced in the previous discussion of shortcomings for the present study except for the last one. The current Consent Form promises participants a Career Profile document produced after the first interview and used as input to the second interview. The level of effort associated with producing this document is significant and may not be practical for a larger sample size as now anticipated for the more broad study. It is expected that this Career Profile will be eliminated from the research design. It is not expected this will impact participant recruitment or data quality. It is also expected that executives from other non-NS regions will be recruited based on suggestions from participants to date applying purposive snowball sampling. Introducing this modification to the recruitment approach and the elimination of the Career Profile will require changes to The Consent Form and approval of by the Research Ethics Board. These improvements, and others yet to be considered, will be incorporated in the research proposal for the more broad study which will benefit greatly from the experience of the present preliminary study.

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