



THE CULTURE OF WOMEN IN TECH

An Unsuitable Job for a Woman

Mariann Hardey

● ● ● EMERALD POINTS

THE CULTURE OF WOMEN IN TECH

Praise for *The Culture of Women in Tech*

‘The contemporary, liberal aesthetic of the digital technology sector is categorically undermined by this insightful text, which draws on women’s voices to evidence the toxic conditions of their working lives and how gender inequalities remain shaped and reinforced by space and place.’

Professor Andy Miah, Chair in Science Communication & Future Media, University of Salford

‘The lack of women working in the tech sector is a well-documented problem. Even more worrying to me is the lack of women considering a career in technology. I welcome Mariann’s contribution to understanding the issues around a lack of diversity in tech especially looking across a number of leading cities around the world to provide a “meta” look across multiple clusters.’

Herb Kim, Director, The Thinking Digital Conference

‘Having set up the UK’s first online Women in Tech network BCSWomen over 20 years ago in response to my negative experiences at tech conferences I’ve been active in this area for a generation. This book adds so much to our understanding of what is really going on in tech culture around gender and diversity and as such is completely invaluable. A seminal, pioneering work that makes a fundamental contribution, read it now.’

Sue Black OBE, Professor of Computer Science,
Durham University

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An Unsuitable Job for a
Woman

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United Kingdom – North America – Japan – India
Malaysia – China

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INVESTOR IN PEOPLE

Dedicated to my daughter Darcey, and to Henry.

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PREFACE

A preface is, I am reliably informed, a space in which to anchor lineage, atone for potential wrongs and show appreciation for the many others who have supported this book.

This is a book primarily about the women in tech that seeks to address questions about diversity and equality of opportunity in tech companies, organisations and industry that impact any worker in tech.

This book is about attempts to redress the balance where women have found themselves trying to escape from stereotypes about competencies and appropriate roles along with attempts to progress a sense of their professional identity. Both women's and men's experience occupy these pages, though in very different ways, each continually shaping and feeding back into the other new opportunities and meanings within tech. Some workers take a dramatic turn away from a mainstream misogynistic blueprint, and the real heroes of these pages are a far cry from the popular media image of well-known women in tech – the Sheryl Sandbergs, Arianna Huffingtons and Martha Lane Foxes. They are instead the many women and men who want to work and stay in tech as an industry that flattens, rather than makes mountains out of, inequality and to support diversity.

To commence, the lineage. The research for this book started life some 15 years ago, out of an opportunity to work with the Girl Geek Network, founded by Sarah Blow in London. At that time Sarah and many other women working in the tech sector were perturbed by the repetition of high-profile male speakers at tech networking and capital raising events. My attention to inequalities and to the significant shift to online profiles (this was 2004/2005) combined with a concern about the image of tech and how far women were from being known in professional tech spaces. As a sociologist of interaction, I was struck by the different spaces and expectations of workers' achievements that were both implicit and also made explicit by gendered terms and visual symbols.

During my Masters and Doctorate theses I had studied and written extensively about the new opportunities for interaction empowered by technology in ways that allowed individuals to set themselves apart from others and embrace difference. It was a very mundane behaviour that interested me then: creating an online profile, communicating with family and friends, reaching out and introducing oneself to new people, sustaining and maintaining friendships, and the distancing and estrangement of others. Though mundane, the emergent of new forms of online and digital etiquette I believed to be reflecting significant changes to everyday life and our relationship to others.

My determined pursuit of what, in retrospect, was a very optimistic view of the positive effect of such aspects of digital lives was reinforced by the specialist communities and groups that emerged onto social media. At this stage, I was interested in the rebalance of interactions away from previous modes of gendered behaviour. I wanted the new meaning behind digital interactions, the way in which individuals felt and regarded them, the way in which

women and men related their experiences online to other elements of their lives. Today, this emphasis has been well documented. But over a decade ago when I first began to talk about new forms of etiquette and gendered meanings, I found myself on a crest of a new wave concerning the potential of tech to shake up and remove previous bias and prejudices.

At this time I had set up my own consulting business, taking mostly financial clients through the potential change to client interactions and marketing as a result of social media. Attention was given to motives behind user behaviour and how this might affect the reputation of the organisation, and what new forms of work employees might occupy. I set myself to observe these changes and to know exactly what opportunities were opening up across the tech sector.

My method was opportunistic in the first instance, and involved studying workers within the emerging tech clusters in the UK, the US and East Asia. In pursuit of an in-depth contextual view I spoke to women and men in each location, wandered around the new innovative tech blocks, jointly attended large and small tech events, and simultaneously took notes about reactions to my own presence in these spaces: I was asked repeatedly whether I was someone's secretary, someone's wife, working in porn, doing PR, someone's nanny or writing a book. The last of these might have been closer to the mark than the others, but is nevertheless revealing of knee-jerk assumptions about what a woman might be doing in a place like this: probably an outside observer – not someone who actually belonged there.

I had very limited success in distancing myself from gendered stereotypes. In cooperation with women tech networks, friends and colleagues I met on these various trips, I started to observe the interest in and labelling of 'women in tech' (WiT).

I wanted to do more than show that the expectations about women and men's roles and responsibilities and professional identities were different. I also wanted to highlight the ways in which large tech organisations and companies had characterised women in tech as a problem to be solved by women. Specifically, I hoped to establish how women workers in tech clusters experienced this as a repressive space; the ways in which their actions fought against such repression; and how they became self-critics, were seen as rebellious and even radical.

It was not easy to sustain this position without some openly hostile reactions. In some cases there was dismissal of any 'real' problem concerning diversity – it was simply that there weren't any 'properly trained' women who could occupy an equal space in tech. Women themselves did not like being set against men where a rift was cast as a result of gender. At this stage, gender became a signpost to a set of much more complex problems. As inequality in tech received more government and media attention, I found it useful to draw out the disparities between the respective professional status and expectations of women and men in tech, along with some of the more ideological reasoning determined by the description 'women in tech'. If women in tech did not like the classification, and could not escape the characterisation of the label, then attention needed to be returned to those who had imposed its meaning. I was keen to detect similarities between workers, such as in methods of career development and promotion, as well as the barriers and challenges in tech clusters.

The above investigations often entailed attributing gendered significance to spaces that merged professional and social interactions; here, place was important, encompassing overtly gendered and often taken-for-granted prejudice as

a feature of contemporary tech culture. There is well-documented technofeminist theory to explain much of this emphasis, yet despite the ways in which women tech groups were coming together and becoming both politicised and marketised, I gradually observed a distancing from wholly gendered attributions of inequality, and an unfavourable reception of ‘feminist’ theory and activism in tech spaces. My early, overly naïve wish to impress ideological and cultural meaning into a more diverse and equal global tech culture speedily diminished. Instead I found myself increasingly aware of the ever-growing importance of and investment in the tech industry, and of the widening gap of inequality that lay within it.

Whereas I had originally believed, along with Wajcman, Turkle, Massey and Haraway, that the masculinised cultural identity of tech could be used to throw light on what was happening to women; I began to have doubts about the upsurge of attention just to the women in tech. While the meanings behind the ‘women in tech’ label is of obsessive interest to me, this did not provide an adequate critique for setting out the range of expectations, or the nature of the ways in which women and men experience tensions within the tech sector.

The danger of focussing solely on women is that this makes solid the lines around the WiT label and the ways in which women are viewed resolutely as ‘the problem’ despite their relative success and increased visibility. And when, at times, I attempted to erase the WiT label from the conversation, to talk about, for example, ways of increasing diversity, climbing the career ladder, and finding more opportunities, I found that my participants quickly resorted to the WiT shorthand and the stereotypes it entailed. What is the impact of this label? And if we were to develop a counter-narrative to WiT, what would it look like?

It was these thoughts that led me to begin research with a group of high-flying women professionals – women who occupied leadership positions and had been in post for at least five years. And unexpectedly, it was from them – the most senior and high-achieving participants – that physical space became such an issue. This I explain in Chapter 3. Gradually a whole book about work culture in the tech clusters took shape, with other sections exploring themes of empowerment, networking and digital presence, and complex accounts of success and challenges. At this time, I started to attend numerous commercial and micro women tech network events. I put on one side events about ‘revenge against men’ and focused on community action, policy change and calls for diversity. I examined in detail the myriad ways in which women and men set out to solve tech’s gender problem.

The arc of evidence-gathering faced a potential interruption when in April 2016, I temporarily paused my attendance at tech events after the birth of my daughter. I necessarily shifted the study online, conducting interviews through Skype, initiating Twitter conversations and setting up Google Hangouts, as well as relying more upon phone conversations. In prompting this increasingly mixed-methods approach, this shift, while born of necessity, ultimately benefited the study. The semi-autobiographical parts of this book are self-evident: I count myself as a woman in tech, with all the messy trappings that come with that label.

In many ways, then, this book is profoundly self-reflexive (at least in terms of established sociological conventions). It has become a safe mental space through which I have been free to question, challenge and attempt resolutions to ‘the problem’. This book is, as friends have pointed out, my very own ‘unsuitable job’.

Other supporters should also be acknowledged here, and the diverse list must include at least: my daughter, zoo menagerie and dear friends.

I also wish to record my thanks to the following people who have read or heard drafts of the book and provided helpful comments: Sue Black, Andy Miah, Simon James and Luke Finley.

And, finally, I dedicate this book to the workers in tech who – in solidarity, intellectually and personally – have accompanied me on my journey to initiate and sustain interventions for diversity and equality.

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INTRODUCTION

This book is located within work in sociology, feminism, gender studies, and labour and occupational studies on the significance of professional identity in shaping roles and responsibilities – and notably the impact of lack of workplace diversity in tech. It examines the impact of masculine tech culture on contemporary conditions of work and professional training in tech. As a consequence, it considers the importance of and need for how gender has been, and continues to be, pivotal to interpretations of work and socio-tech culture incentivising new global policies for equality to combat ‘difference’ and to make adjustments to the lack of workplace diversity. It considers how gender has brought women’s perspectives to bear on tech culture, Science, Technology, Engineering and Mathematics (STEM) education and training and regulation. The work is based on primary research carried out at global tech clusters in the UK, the US and East Asia to examine the rise of entrepreneurial work and leadership and the contemporary urban setting of tech culture.

The book explores how tech workers articulate their place within the workforce and experience the spaces of tech clusters – often known as tech cities. It considers these workers’ ideals, visions and perspectives within a self-determining masculine tech culture and, on a broader global scale, how they are aligned to other tech clusters. In addition, it asks if the

place of ‘women in tech’ is inseparable from masculine culture and leadership practices, and what the cultural, social, personal and economic consequences are of gender as a point of difference in the context of work in the tech sector. Finally, this is an opportunity to examine how the lack of diversity in STEM and across global tech clusters has been brought to public attention, and how popular labels such as ‘women in tech’ have been acknowledged, celebrated, questioned, resisted and (for the most part) approved.

This book is intended as an interdisciplinary contribution to the broader, ongoing attention that is being given to the lack of diversity in STEM and in tech industries. It highlights the diverse contributions scholars have made, and continue to make, to contemporary developments around work and professional and social interactions across tech spaces. It invites readers to consider how the label ‘women in tech’ may be damaging to self-determining communities for equality and gives a fuller account of the points of activism achieved from within and outside of the tech sector. Although the book confirms that the process of ensuring greater diversity in tech is far from complete, it nonetheless highlights encouraging accounts of progress towards this important goal.

THE GLOBAL PROGRESSION OF TECH DIVERSITY

There has been considerable media coverage highlighting the lack of gender diversity in tech, and particularly, in the expansion of areas benefiting from high-growth and investment in tech clusters. Recent protest about the status of ‘women’s work’ and women’s opportunities for career progression has raised significant questions about the connections between masculine ideology and tech culture, and the ways in which the digital and physical places of tech clusters can be

used to galvanise support and raise awareness about misogyny, sexism and the barriers women face working in tech. Before #MeToo and the development of global digital women's movements, women working in tech were seen only through the lens of the masculine tech culture setting. This way of viewing the problem of diversity is hugely problematic in that it defines gender itself as the problem and attributes responsibility for resolving it solely to women. The implication of this is that it is women who lack the knowledge, skills and expertise to make the most of a career and a professional role in tech. Most worryingly, inequality is reinforced in a way that separates women's and men's work, their accomplishments and their professional skills training.

Statistically, at a global level, women are significantly underrepresented in STEM:

- According to UNESCO, 29% of those in science research and development are women, with a low of 19% in South and West Asia and a high of 48% in Central Asia (UNESCO, 2017);
- In the US, 80% of STEM jobs are in engineering and computer science but women comprise only 12% of the engineering workforce and 26% of the computing workforce (UNESCO, 2017);
- In the UK, women are underrepresented in STEM at every stage of the pipeline: in a study by PwC, only 15% of employees working in STEM roles in the UK were female and only 5% of leadership positions in the technology industry were held by women (PricewaterhouseCoopers, 2018).

If it were only a lack of knowledge about education and career pathways in STEM that presented barriers to women's

progression, then the elimination of discrimination and gender inequalities would be resolved by now. The lack of parity in progression, support for women's leadership roles and pay are well-known and classified as global issues (Funk & Parker, 2018). However, despite this knowledge, difference continues, and creates conflict within the tech sector.

How, then, has the history of women's (often invisible) presence in the tech sector affected the roles and experiences of the present-day tech workforce? These roles and experiences have been similar to those of women entering other male-dominated occupations (Hardey, 2019a). Women are repeatedly channelled into low-level, temporary work and the 'least desirable jobs within occupations' (Garcia, 2003, p. 335). Women brewers downplay their gender to emphasise a distinctively masculine identity in order to emphasise physical competence (Rydzik & Ellis-Vowles, 2018); women engineers identify with and relate to the language and behaviour of a masculine profession (Angouri, 2011; Miller, 2004; Powell, Bagilhole, & Dainty, 2009); in the legal profession, the aspirations of women to become a law firm partner are disproportionately restricted in the presence of family and caring responsibilities (Azmat & Ferrer, 2017); women chefs predominate at lower levels of the professional cooking industry because of the dichotomy of cooking tasks, considered as female within the domestic sphere and male as a profession (Haddaji, Albors-Garrigós, & García-Segovia, 2017); women police officers take up the least-desired roles, often involving other women, and regulation of youth and child welfare (Brown, 2017; Garcia, 2003; Guajardo, 2016; Jackson, 2017); and in STEM, the often-told story is that women demonstrate less interest in STEM topics, and are less likely to invest in the education and skills necessary to work long-term in the STEM labour force (Cheryan, Ziegler, Montoya, & Jiang, 2017; Sassler, Glass, Levitte, & Michelsmore, 2017).

In the following chapters, I make clear how women working in tech clusters engage in identity work at both individual and collective levels relative to the stereotypes, and in particular to the label of ‘women in tech’, and how they accentuate their different and collective contribution to professional roles and work. The remainder of this introductory chapter sets out the research methodology and describes the tech cluster sites of the study.

RESEARCHING GLOBAL TECH CULTURE

I am primarily a qualitative social scientist interested in gender equality, technology and the impact of the lack of diversity on professional structures. My concern in this research was to draw on workers’ long-term experiences of working in tech clusters. What has emerged is a long-term study of 563 interview and focus group participants, and 802 survey respondents (participant study total $n = 1,365$) from the UK, the US and East Asia conducted during 2010–2019. The study initially asked about diversity in ‘tech cities’ in the UK, before expanding into other global regions in the US and East Asia that had a similar core of tech clusters in a regional space. The context of space is significant in this study and forms a core element to each chapter, leading to the consideration of material spaces of professional work and participants’ movement within tech clusters; and the social and cultural aspects of interactions and networking, including digital communication and maintaining a professional presence across social media platforms. Finally, space forms a core part of the methodology, which allowed participants multiple opportunities and forms of interaction through which to contribute to the study.

TECH CLUSTERS

This study is based on regional areas renowned for their high-density location of technology companies and innovation, sometimes called ‘tech cities’ to reflect the frequent growth of these areas on the fringes of large urban cities or ‘tech clusters’ to reflect the ‘cluster’ effect of multiple technology companies operating in close proximity to one another. The key features that characterise the tech clusters in this study include the following:

- They are large-scale urban areas;
- They are part of a ‘golden triangle’ with university, industry and government investment;
- They receive international tech investment, including global sponsorship;
- They are notable for their concentrated innovation density – these are areas renowned for a critical mass of interconnected companies creating innovation hubs and benefiting from access to large-scale business sites;
- They exhibit a tech community identity – to enable and enhance growth in the area and to support future collaborations;
- They are recognised at a global level.

The study draws on tech workers’ experiences of working in technology clusters across three global regions, in the UK, the US and East Asia ([Table I.1](#)).

The focus on these sites reflects the levels of investment these areas receive from national government and global organisations, which in turn underscores the volume and

Table I.1. Summary of Tech Cluster Sites.

Global Tech Region	Tech Cluster Area Summary
United Kingdom <i>Silicon Roundabout, London</i>	Located in Shoreditch, occupying an area in East London between St Luke's and Hackney Road known as 'Silicon Roundabout'. The area is home to a slew of tech companies, including Facebook, Google, Microsoft, Amazon, Seedcamp, and Startup Weekend. To date, Silicon Roundabout has received over £2.49 billion in venture capital in 2018 (Skelton, 2019).
United States <i>Silicon Alley, New York</i>	Located in New York's Midtown South, Manhattan around the Flatiron district known as 'Silicon Alley'. As this area is new, the long-term figures about investment, employment and venture capital are sparse – as of 2017, New York generated over US \$12 billion in venture capital investment (Saljoughian, 2018).
<i>Silicon Valley, California</i>	Located in Northern California, in the southern part of the San Francisco Bay area known as 'Silicon Valley', renowned for high turn-over of tech firms and investment activity. Silicon Valley reported total venture capital investment of US \$84 billion in 2017 (Magistretti, 2018).

Table I.1. (Continued)**Global Tech Region****Tech Cluster Area Summary****East Asia (China and Taiwan)**

*Asia Silicon Valley
Development (ASVD),
Hsinchu Science Park*

Set up by the Taiwan Government and launched in 2016 the aim of the 'Asia Silicon Valley Development' (ASVD) is to create a competitive global tech cluster in Asia to parallel the capabilities of Silicon Valley. Most ASVD activity is located in Hsinchu Science Park and through Hsinchu City and Hsinchu County. Taiwan's tech industry focus is on AI and IoT with Taiwan's global market share is projected to grow from 3.8% in 2015, to 4.2% in 2020, and to 5% in 2025 (ASVDA, 2016; National Development Council, 2015).

*Made in China (MIC2025),
Beijing, Shanghai and
Shenzhen*

China's equivalent tech clusters are located in large urban cities – Beijing, Shanghai and Shenzhen, tech development in these areas is part of the 'Made in China' (MIC2025) initiative. China's latest investment in tech forms part of the national MIC2025 plan or 'Industry 4.0' also inspired by the United States' Industrial Internet of Things, and aims to shift China towards higher value, advanced manufacturing dominated by automation, robotics, big data and cloud computing (Easen, 2017; Jing, 2017). Beijing and Shenzhen dominate capitalising on big data analytics, robotics and AI. In terms of investment, the top China tech companies, Baidu, Alibaba, Tencent and JD.com have a collective market capitalisation of US \$950.35 billion, ahead of the aggregate valuation of US \$665 billion for established global tech players, Intel, Cisco Systems, Oracle and IBM (Jing, 2017).