

Designing the User Experience of Onboarding Systems for DDI Management Systems

(Technical Paper)

Exploration Of Gender-Equitable Internet In South Asia

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Exploration Of Gender-Equitable Internet In South Asia

Introduction

Remote working as well as expanding use of technology and the internet by companies has caused a need for network management and maintenance. Small and medium sized companies do not have the resources or employee expertise to properly implement a Domain Name System, Dynamic Host Configuration Protocol, and IP Address Management, collectively known as DDI, management system themselves. A variety of companies have started selling DDI management systems, but the setup and configuration of the system with individual network systems are complex and often lead to features being missed or the security of the system being compromised. My technical project is approaching this problem by developing an onboarding process for the DDI systems. Creating a solution to this problem is important because of the complexity of asynchronous components of DDI management setup as well as the varying expertise levels of users.

Creating an effective onboarding process for a DDI management product involves implementing user experience design principles and following the user experience design process. Conducting user interviews, mapping different users' journeys, completing a task analysis, and designing low-fidelity prototypes and high-fidelity prototypes, all are required to ensure we are designing with the user in mind. User experience design in general has a strong emphasis on understanding users and their design needs.

Within different areas of the global market, Low and Middle-Income Countries (LMICs) have sociocultural differences from High-income countries that impact their ability to access and use technology and the internet. User experience design has been moving towards creating products specifically designed for these underrepresented groups, resulting in 3.2 billion people in LMICs accessing the internet (Shanahan, 2022, page 4). However, when considering all the

people who are able to access the internet in LMICs, especially in South Asia, there is a gender gap present.

The research question I will be investigating is what is the current state of internet access, privacy, and safety for women in South Asia and how should the world respond to the gender inequity of the internet they face? Being able to answer this question is important for South Asian women because the internet provides opportunities for women to gain independence and have more equitable access to information across the world. There is no direct correlation between the work my capstone team will be doing with the onboarding process of DDI management systems and gender-equitable internet in South Asia. However, I believe understanding the struggles in accessibility, privacy, and safety in gender equity online expands the understanding of the importance of different user groups and sociocultural factors when designing products.

In this paper, I will go through how my technical project team is using human-centered design to create an onboarding process for DDI management systems. I will then cover the current state of gender-equitable internet in South Asian countries and future recommendations to narrow the gender gap. Finally, I will discuss key texts about gender equitable internet access, privacy, and safety in South Asia.

Designing The User Experience Of Onboarding Systems For DDI Management Systems

Companies are finding more and more value in migrating their data and administrative tasks to the cloud and digital environments. Being able to use cloud servers rather than hosting the storage on-premises has freed up money and resources for companies of all sizes (Team Cleo, 2022). It also has opened the door for smaller companies that could not practically support the IT infrastructure other large companies have and allows them to remain competitive even

with a smaller budget. Part of this move to cloud computing involves employees around the world being able to securely access a company's data and resources.

To set up a network, IP addresses are assigned to devices on the network. An IP address is an identifier for a device that contains location information and allows devices to be communicated with. IP addresses are also able to differentiate between computers, routers, and websites (Kaspersky, 2022). Companies can manually assign IP addresses, but as the size of the company and the devices that need to be managed grows, this becomes extremely inefficient and complicated. To plan, track, and manage the assignment and recovery of these IP addresses, network administrators use Internet Protocol Address Management (IPAM). Dynamic Host Configuration Protocol (DHCP) is also used in network management to assign IP addresses to network-connected devices upon request. Finally, network administrators are able to translate domain names into IP addresses using Domain Name System (DNS) (Bluecat Networks, 2022). In order to manage their network, companies need to maintain DNS, DHCP, and IPAM, which are collectively known as DDI.

This involves the IT department managing DNS and DHCP, assigning IP addresses, creating and managing subnets, and checking and reporting device connection history. A necessity for most organizations, DDI enables all communications over an IP-based network. Small and medium businesses in particular struggle to keep up with managing DDI for their network because of a limited budget as well as few qualified network engineers and IT staff.

Due to the expertise level needed to setup and maintain DDI for a company, DDI management systems have been created and are sold as SaaS (Software as a Service). This eliminates the need to manually do repetitive tasks such as issuing IP addresses, finding out

which devices are connected to the network, and auditing device connection history (InfoBlox, 2022). The management of DDI has been streamlined by a variety of companies, however, the setup and onboarding process is still lacking clarity and ease of use without expert network engineers and private contractors.

The technical project I am working on is focusing on the onboarding process for DDI management systems. The complexity and length of the onboarding process make it different from typical software onboarding processes. There are also a variety of asynchronous components involved in the onboarding process to get a network on the DDI management system, leading to the development of a novel solution regarding onboarding. The other nuance of the onboarding process we are designing is that it should be accessible and manageable for customers with varying levels of IT experience. This allows for greater accessibility for small and medium-sized companies that were previously unable to implement DDI into their network management because of budget and employee expertise constraints.

To improve the onboarding process my team and I will be completing user interviews and journey mapping to gain an understanding of the current requirements. Using this information as well as additional research about DDI systems, we will create a hierarchical task analysis of the current workflow. Understanding what the requirements are as well as the workflow to setup and begin using a DDI management system are vital components in developing the onboarding process. My team will then design low-fidelity designs for a suggested onboarding process and receive user feedback. Finally, we will design high-fidelity mockups of the DDI management system onboarding process. The end goal is to have a prototype of an interface that has a coherent workflow that will provide users with a more enjoyable navigation experience and the

proper organization that is necessary for ensuring users have knowledge of all of the features of the DDI product.

Exploration Of Gender-Equitable Internet In South Asia

Through efforts by companies and governments, the internet has increased in global accessibility and affordability, however, there still remains a gender gap. Looking specifically at South Asia, the ability for women to access the internet, as well as maintain their privacy and safety, is significantly more difficult than their male counterparts. South Asia consists of the following countries: Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka. I am focusing on South Asian countries because they have maintained patriarchal values and social norms that lead to gender inequality. In particular, there are extremely high rates of gender-based violence in South Asia, with two out of every five women in South Asia experiencing some form of gender-based violence in their life (Solotaroff, 2014). The sociocultural norms lead to men having control of resources and the bodies of women in these countries, which has hindered their access to and use of the internet.

The research question I will be investigating is what is the current state of internet access, privacy, and safety for women in South Asia and how should the world respond to the gender inequity of the internet they face? Understanding the gender gap on the internet in South Asian countries is required before providing recommendations because of the sociocultural differences in South Asia compared to other LMICs. Access to the internet overall has improved in South Asia in recent years, however, we are still seeing far fewer women being able to access the internet independently due to the patriarchal nature of South Asia. In LMICs shared devices are the most common way for people, especially women, to access the internet. The needs of women when it comes to privacy on these shared devices and the internet are important in understanding

why the gender gap in the internet for South Asian countries is occurring. Finally, retaliation and abuse are common deterrents for women when it comes to the internet. Researching women's stories and feelings when it comes to their safety adds more context about what can and can not be done when it comes to closing the internet gender gap.

Based on the current status of gender equity on the internet, I will be researching how to move South Asia towards gender equity online. This will help with the UN sustainability goal of "achieving gender equality and empowering all women and girls," (Google, 2019, page 3). A gender-equitable internet will allow women to become more independent, provide more diverse knowledge, impact their local and global communities, and increase GDP growth (Shanahan, 2022, page 5). Overall the importance of closing the gender gap when it comes to the internet continues to grow as the opportunities and resources that come with the internet continue to expand.

When exploring the gender equity of the internet in South Asia, the relevant social groups include cis women and their male partners, family members, coworkers, and friends. Understanding the relationship between women and these groups will give insight into how women use the internet and how these social groups interact around and with the internet. The focus will primarily be on adult women, however, I will still be exploring internet equity for young girls and adolescent women. While still relevant and incredibly important, I am choosing to exclude trans women and women in the LGBTQ+ community due to the additional factors and struggles they face when it comes to internet equity.

The Science and Technology in Society frameworks I will be using are Actor-Network Theory and Technofeminist Theory. Using Actor-Network Theory will allow for the relationships between women in South Asia, their male partners, family members, coworkers,

and friends to the internet to become more clear. The relationships will also guide recommendations about what can be done to close the gender gap since negative relationships will be focused on. However, I will also be using Technofeminist Theory when answering these questions. Exploring the relationship between gender and the internet will build on the Actor-Network Theory. I am planning on exploring how the internet in South Asia is both a consequence of gender relations and a source of gender relations (Wajcman, 2004). Since the topic of this paper is about gender equitable internet in South Asia, focusing on how gender interacts with the internet is incredibly important.

My timeline for researching gender equitable internet in South Asia is to start by doing research on case studies of women's experience with internet access, privacy, and security. Understanding the current state of women's relationship with the internet should be completed by the end of January 2023. I will then research what methods of moving towards gender equity online have been utilized in different regions by the end of February. This will allow for me to finalize my recommendations and write my final STS thesis by April. The final thesis will be finished by May 2023.

Key Texts

“Toward Gender Equity Online: Research with the Next Billion Users” covers research done by Google about gender equitable internet around the world. They interview 363 women, both cis and trans, to understand how they access, find content, maintain privacy, and maintain safety on the internet. This paper identifies access, content & community, privacy, and safety as the four main roadblocks to gender equity online across the world. I will be using this paper to provide support for the rational and real-life stories behind the internet gender gap specifically in

South Asia. I will also be utilizing the research done in other countries regarding the internet gender gap to inform my conclusions about South Asia (Sambasivan).

“The Mobile Gender Gap Report 2022” is a yearly report written and compiled by GSMA about the global internet gender gap. One of the main findings in the report was that the mobile internet gender gap had been reducing, but progress has stalled. They also emphasize how access to a mobile phone and mobile internet provides women with opportunities to improve their lives. The report is exploring the mobile gender gap report across the world, but I will mainly be using the research and conclusions about South Asia. I will be using the report's findings for the most up-to-date state of women's current internet state in South Asia since the report is from 2022 (Shanahan, 2022).

“‘They Don't Leave Us Alone Anywhere We Go’: Gender and Digital Abuse in South Asia’ is one of the critical texts that focuses specifically on South Asia. It is a study of women's online abuse experiences and coping practices in South Asia. This paper also discusses how South Asian feminism is in contrast with Western feminism, which views gender as more of a universal category, that can be approached not considering other factors. South Asian feminism looks at not just gender, but also regional specificities of family, class, sexuality, and religion. Since I am exploring barriers to gender equity in internet access in South Asia I will be using this research paper for personal accounts about barriers to using technology, specifically online abuse. The paper describes the different types of online abuse that South Asian women have encountered and coped with using a feminist lens. The three largest types of online abuse for South Asian women are cyberstalking, impersonation, and personal content leakages (Sambasivan, 2019).

“‘Privacy is not for me, it's for those rich women’: Performative Privacy Practices on Mobile Phones by Women in South Asia’ is also one of the key texts with a focus on South Asia.

Women in South Asia have different cultural norms and use shared phones. This paper dives into how women in South Asia perceive, manage, and control their personal privacy. This paper examines the ways in which current technology designs could better support the privacy challenges of women in South Asia. The findings from the study highlight that device sharing is a cultural expectation, and that privacy is not part of the South Asian culture which places value on openness. I will use the results of this study to inform the internet privacy portion of my research. Specifically how to incorporate the cultural idea of device sharing while still maintaining privacy for women to protect them from abuse (Sambasivan).

Bardzell's paper, "Feminist HCI: Taking Stock and Outlining an Agenda for Design", consciously outlines feminist interaction design and where there are opportunities for feminist contributions to interaction design. Bardzell uses feminist theory in four areas relating to HCI: theory, methodology, user research, and evaluation. Going into detail about each of these areas, we can see how using feminism can positively impact all of these areas in HCI. The paper also explores how generative contributions involve the use of feminist approaches explicitly, while critique-based contributions use feminist approaches to analyze designs and design processes. Bardzell writes about how the quality of pluralism is tied to the concept of feminism as well. A key feminist strategy is to denaturalize normative conventions. Pluralism "refers to design artifacts that resist any single, totalizing, or universal point of view," which in summary makes designs not normative (Bardzell, 2017, pg.1305). I plan to use this concept of pluralism and how feminist theory supports it to explore how western concepts for equitable internet access will not be applicable to women in South Asia. I will also use Bardzell's opinion on the feminist standpoint theory which is that women's viewpoints and experiences should be used for social science research (Bardzell, 2017).

“Design Within a Patriarchal Society: Opportunities and Challenges in Designing for Rural Women in Bangladesh” is about a study of rural Bangladesh women and their interactions with technology. The first part of the paper is about gaining an understanding of these women’s lives and their daily activities and the challenges that come with them. The second part explores how women use technology in such a deeply patriarchal society. The researchers then conclude that to design technology to support low-income rural women in Bangladesh they have to design within the patriarchy. I plan to use the different tactics for designing within a patriarchal society while considering their tradeoffs when discussing internet accessibility design. I will also be using this paper’s daily life of Bangladesh women research to provide background for the users in my research since the western world is very different (Sultana, 2018).

“Everyone Has Some Personal Stuff”: Designing to Support Digital Privacy with Shared Mobile Phone Use in Bangladesh” reports on a study done on shared devices and a new app to increase user privacy. There are two accounts per app each associated with a different password but the same username. The shared account has data that the user is willing to share with others, such as family members, and the other private account has information that they would like to keep secret. The research then reports on how the app is used and accepted by Bangladeshi women, and the comments they have on the improvement of the app. I will use this paper to comment on privacy tactics used in South Asia for shared devices and how to apply them to internet access. Most importantly I will be utilizing this paper's feedback from users, and how having shared devices impacts privacy (Ahmed, 2019).

“Technofeminism” is a book that is explaining the theory of Technofeminism, which is the intersection of feminist and technology studies. The author comments on actor-network theory, and how there are issues when incorporating feminism. Specifically how with a focus on

relevant social groups in the process of technological development it is “difficult to take account of those actors who are routinely marginalized or excluded from a network.” The author also comments on the novel *Aramis* and how all the different characters of the book are those of male designers, politicians and technical experts, the male professor, and his male student. *Aramis* is even referred to as a ‘he’. I will be using this book to look at the internet gender gap in South Asia from a technofeminist viewpoint. I still plan to use Actor-Network Theory but will tweak it as suggested by the author to be sure to include not only the main actors but also the marginalized actors (Wajcman, 2004).

“Towards a Feminist HCI Methodology: Social Science, Feminism, and HCI” discusses how HCI methodologies have an intersection with Feminism. The paper first discussed how feminist methodologies are committed to scientific and moral objectives. They also specified to be successful HCI has to be connected to feminist thought, and not just the issue of gender. Finally, they discuss how feminist thought emphasizes having an empathic relationship with research participants focused on understanding their experiences. I will use this paper to implement feminist thought into any suggestions I make regarding internet equality in South Asia. In particular, I will be focusing on maintaining the empathic relationship between South Asian women these suggestions would impact us in the Western world making these suggestions (Bardzell, 2017).

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