

Beyond the Default Male User: A Literature Review of Feminist Perspectives in Human-Centred Design

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Abstract

Human-Centred Design (HCD) is widely recognised as a design philosophy that prioritises users' needs, experiences, and interactions throughout the development of products, services, and systems. Despite its user-focused principles, traditional HCD has frequently relied on the assumption of a universal or “average” user, inadvertently treating the male body, experiences, and perspectives as the default standard. This structural bias has contributed to the exclusion or underrepresentation of women, LGBTQ+ individuals, persons with disabilities, older adults, and other marginalised communities, resulting in products and technologies that inadequately address the diversity of human needs. Evidence from healthcare, automotive safety, digital technologies, ergonomics, and artificial intelligence demonstrates that default male assumptions can produce unequal outcomes with significant social, economic, and health consequences.

This literature review critically examines feminist perspectives on Human-Centred Design and explores how feminist theories challenge the concept of the “default male user.” Drawing upon interdisciplinary literature from human–computer interaction, design studies, feminist theory, healthcare, ergonomics, psychology, and artificial intelligence, the review synthesises existing research on gender bias in design, inclusive and participatory design methodologies, intersectionality, feminist ethics of care, and design justice. It further evaluates the limitations of conventional Human-Centred Design frameworks and analyses emerging approaches that advocate for the active inclusion of historically marginalised users throughout the design process.

The review argues that truly human-centred design cannot be achieved through gender-neutral assumptions or average-user models. Instead, diversity, equity, accessibility, and intersectionality must be recognised as fundamental design principles rather than supplementary considerations. By integrating feminist perspectives into Human-Centred Design, designers can better identify hidden biases, improve representation in research and testing, and develop products, services, and technologies that are safer, more accessible, and more equitable for diverse populations. Ultimately, this review contributes to the growing body of scholarship advocating for a shift from designing for an assumed universal user toward designing with and for diverse human experiences.

Keywords: Human-Centred Design, feminist design, default male user, gender bias, inclusive design, intersectionality, human–computer interaction, design justice, participatory design.

Chapter 1: Introduction

1.1 Background of Human-Centred Design (HCD)

1.1.1 Understanding Human-Centred Design (HCD) and its background

Human-Centred Design (HCD) is an approach to product, service, or systems design that considers the end users and their needs, wants, or limitations at every stage from design through to delivery. Not just asking: “How do we build this?”, the mind helps to shift to — How does the user want it?

This goes through an iterative cycle of design → test → improve → repeat. The base idea is not necessarily being the best in a technical area, but understanding what the user needs. It even takes into account the behaviour, emotions, and expectations of users as well as the parameters in which the product/app/website will be used. That makes better applications, websites, or interfaces. In large part, these results are better when you—users are involved via feedback and during the testing phase.

1.1.2 Human-Centred Design(HCD) evolution from usability engineering to experience-driven design

HCD has not always looked the way it does today. Initially, performance, reliability and technical specifications of hardware components were focused on in its earlier stages (Ahmed, R., & Kader, M.A., 2025). Questions for users, like how they would complete a task, if there were any mistakes made, and the simplest of the interface was what it should look like to be run smoothly and efficiently faced by designers. Evaluation of the success of a design was often carried out by performance measures like how long it took and time percent efficiency.

Slowly this point-of-view became the cornerstone of Human-Centred Design(HCD). It was found by researchers and designers that usability alone could not guarantee user satisfaction. A product can be designer functional, and it can still flop if it fails to meet the demands, preferences and needs of users. That is what steers the helm in user-focused design, a user-centered experience that considers emotions and engagement and everything for the want of something from the product. These factors will be of concern in the design phase, hence aesthetic design (visual stimulus), personalisation, and emotional response all play a major role.

These days, user experience is really about the whole journey a person goes through while using a product: what they feel, what drives them, and how they interact with it. It's not just about whether something works properly, but whether it actually feels good and easy to use. At the end of the day, good design isn't just functional, it makes the experience enjoyable and meaningful for the user.

1.1.3 Human-Centred Design(HCD) highlights its widespread use in tech, healthcare, and product design

Today, Human-Centred Design (HCD) has branched out across tech, healthcare, and general product development. There's a growing realization in these industries that just building the tech isn't enough—understanding the person using it is just as vital. HCD moves past just making things "work"; it focuses on creating solutions that actually fit into real-world scenarios by prioritizing the user's actual experience and needs.

The concept itself has deep roots in ergonomics and computer science. You can see this in the ISO 9241–210 standard, which defines it as a design approach aimed at making systems more usable by applying human factors and "usability knowledge" to the development process [Bazzano AN, et al. (2017)].

In the tech world specifically, HCD is the backbone of software and mobile app development. The goal is simple: make interfaces that people can navigate without a manual, even the first time they open the app.

This reduces user errors and makes digital tools accessible to way more people. Plus, it keeps the system evolving because user feedback constantly drives the next update.

It's the same story in healthcare and product design. In a medical setting, HCD is used to build patient-focused services and tools that are less intimidating and easier for doctors to operate safely. When it comes to everyday products, it's about making sure the things that are used daily aren't just functional, but comfortable and secure. By focusing on accessibility and the "human" side of the equation, HCD creates products that should just fit into daily life without any friction.

1.1.4 Subtly introduce that “user” has historically been generalised, often ignoring diversity.

Even though Human-Centred Design claims to be about people, the way "the user" is defined is usually a massive generalization. In most projects, designers treat users as one big, uniform group. This is a mistake because it completely misses the reality of human diversity—it ignores huge differences in things like physical ability, cultural roots, and the social environments people actually live in. For a long time, the industry has leaned on this "average user" model, but the truth is that an average person doesn't really exist (Dagwell & Weber, 1983, pp. 987-997). When you design for a statistical mean, you basically end up excluding anyone who doesn't fit that narrow mold (Norman, 2005, pp. 14-19).

That is a huge gap in traditional HCD. It isn't something you can just fix with minor tweaks; it's going to take a complete shift in how designers think. Right from the start, designers need to be really critical about exactly who they're representing. Diversity can't just be a "special case" or an afterthought you try to fix at the end of a project. It has to be a fundamental reality of the design process itself.

1.2 The Problem of the Default Male User

1.2.1 Definition of the concept of the “default male user” in design.

The "default male" phenomenon serves as a pervasive, often invisible baseline in system development, where men are treated as the universal proxy for the entire human population. By positioning this specific demographic as the "neutral" norm, design frameworks inherently push women and LGBTQ+ individuals to the periphery. This isn't always a deliberate exclusion; rather, it is a structural byproduct of failing to account for human variance at the very foundation of the design process.

The stakes of this bias are often life-threatening. In pharmacological research, for instance, a historical lack of sex-disaggregated data means many medications carry a much higher risk of adverse reactions for women because their physiological differences were simply ignored (Zucker & Prendergast, 2020). A similar pattern exists in automotive engineering. For decades, crash-test methodologies relied almost exclusively on male physical archetypes, which statistically increased the likelihood of severe injury or death for anyone with a different body type (Schiebinger & Hoyt, 2011). Ultimately, these disparities demonstrate that when a system is built around a single "standard" user, it fundamentally fails to provide safety or functionality for the actual diversity of the population.

1.2.2 Examples like crash test dummies, smartphone sizes, medical trials.

The "default male" standard is perhaps most glaring in automotive safety engineering, where female drivers are statistically more likely to suffer severe injury or death in collisions (González & Labeaga, 2025). The persistent use of safety protocols—specifically regarding seatbelts and airbags—anchored in the 'average' male physique (Norton, 2021) has resulted in a critical design gap. Even though the people behind the wheel have changed over the last few decades, these inflexible engineering benchmarks have continued to marginalize the female physique. By treating it as a mere outlier instead of a foundational design requirement, the industry has essentially built a system that fails to protect everyone equally (A

Crash Test Bias Puts Female Drivers at Risk, 2017).

This pattern of exclusion is equally dangerous in clinical research. While women are disproportionately affected by conditions like Alzheimer's, historical medical data remains heavily skewed toward male subjects (Women and Alzheimer's, n.d.). This lack of sex-disaggregated testing means that pharmacological treatments often fail to account for distinct hormonal cycles, frequently resulting in more intense side effects or reduced efficacy in women (Zopf et al., 2009; Spoletini et al., 2012; Hernandez et al., 2025).

The bias extends into the ergonomics of modern technology as well. The industry's push for massive smartphone screens really highlights how design can ignore basic ergonomics for smaller hand sizes, a move that naturally impacts female users more than anyone else (Dinamani & Shibley, 2023; Perez, 2019). This exclusionary gap isn't just about the physical hardware, either. Digital systems often fall short when it comes to LGBTQ+ identities, resulting in rigid environments that fail to reflect or respect their actual lived experiences (Durani et al., n.d.). Even products explicitly marketed to women, such as menstrual hygiene items, have historically been designed around social stigmas—exemplified by the long-standing use of blue liquid in advertisements rather than realistic representations (Empowered Bleeders..., 2019; Gender Bias In Design, 2023). These systemic failures demonstrate that when designers treat the male experience as the baseline, they unintentionally cement these exclusions into the very best practices of the industry (Cheryan & Markus, 2020).

1.3 Emergence of Feminist Perspectives in Design

1.3.1 Introduction to feminist theory entering the HCI and design fields.

Feminist HCI is now at an important point in its lifecycle, on the tenth anniversary of the publication of the first prominent HCI work that dared to call itself explicitly 'feminist'. This acknowledgement of time has been accompanied by important critiques of how such theories of feminisms are discussed, and how they are leveraged for those in work with, such as the erasure of the social categorisation of race in more neutral representations of intersectionality (Erete, S. 2021).

Over time, feminist perspectives started becoming part of fields like Human-Computer Interaction (HCI) and design, mainly to question how things were being designed and for whom. Earlier approaches usually talked about "the user" as if all users were the same, without really thinking about how different people might experience the same system differently. Feminist theory changed this by shifting the focus a bit. Instead of only asking what users need, it also asks whose needs are actually being considered and whose are being ignored.

1.3.2 Decentering the "Default Male" Through Feminist Inquiry

The reason traditional design has not fixed gender inequality is not that it does so unwittingly—it is because the issue comes from a structure built around the industry focusing on anyone being the "default male" archetype. For decades there was an implicit assumption that a male-centric user could act as a universal model for all users (Oudshoorn et al., 2004, pp. 30-63). This pushed women and LGBTQ+ into the far corner of development (Durán & Flesler, 2019). Its rarely like this overt act of malignant intent, but more just inevitabilities organized around habits not scrutinized and blind spots in systems that built a world of products that are simply out-of-touch with how the majority of people actually live (Kortum, 2021).

Feminist design is not about diversity patching when the heavy lifting has finished. Its about literally baking the power dynamics and the representation into the first principles blueprint, rather than as an

afterthought in the UI — equity becomes a structural necessity. This necessitates a messy, but essential, engagement with authority. The only question that must be asked is: This raises important questions regarding authority and decision-making within design processes. Who is treating whose life like the normal one. In this context, representation is not about putting some diverse photos on a landing page it's whether the design itself honors humanity instead of just meeting a bare-minimum usability benchmark.

1.3.3 The Ethics of Prioritization

After seemingly endless iterations searching for generic, "sanitized" user needs, the field is finally beginning to look beyond this towards a much more sleazy critique of how it was build (Maar et al., 2026). The 'user' as a fiction is a monolithic. The monolith referred to as the 'user' is a fiction. It is nothing but a myth which masks systematic social inequalities by putting together all the people in one homogeneous box. This approach not only misses the point, but also subsidizes the very bias that needs to be fixed (West, 2020).

Not only do feminist methodologies ignore this flattened view, they attack it. Rather than ticking off boxes, these approaches interrogate whose interests are being served and require users to be active collaborators—taking the field well beyond basic functionality (Zacar et al., 2022, pp. This extends beyond functional performance alone. This is an intentional excavation to unearth the invisible biases buried in traditional workflows (Vallerand, 2024). Ensuring equitable design outcomes should be considered a fundamental design requirement rather than an optional consideration, irrespective of gender, class and certainly ethnicity. It requires radical transparency, such practices remain insufficiently adopted within mainstream design contexts (Costanza-Chock, 2018).

1.4 Research Gap and Rationale

The absolute ubiquity of Human-Centred Design (HCD) often hides the fact that the framework remains riddled with unaddressed voids. We've adopted the label without actually filling the gaps." Most current literature clings to this idea of a "universal" user—a sanitized proxy that effectively ignores the friction of intersecting identities. This isn't just an oversight; it yields an oversimplified understanding of user experience. It fails. It misses the messy, non-linear reality of human diversity, leaving massive gaps in our understanding of anyone who doesn't fit a "standard" mold.

1.4.1 The Intersectional Void in HCD

In HCD research, intersectionality is usually a footnote rather than a core metric (Bellini et al., 2022). Studies tend to flatten the notion of a homogeneous user population oversimplifies the diversity of human experiences. They ignore a basic truth: factors like gender, age, and culture don't just exist in isolation; they overlap and collide. A woman's interaction with a system isn't merely "different" from a man's—it is forged by a specific, unique cross-section of social pressures that generic studies simply don't track. By dismissively labeling these nuances as "edge cases," designers end up baking exclusion directly into the systems they claim are inclusive.

1.4.2 Mainstream Design's Resistance to Feminist Praxis

Feminist methodologies are frequently discussed but rarely deployed in mainstream practice. "Instead of a foundational necessity, they're treated as an 'add-on'—nothing more than a late-stage ethical patch. This hesitation keeps design chained to old-school frameworks that simply aren't equipped to gut deep-seated bias (Teo & Febbraro, 2024). The result is a cycle of "functional" designs that quietly alienate any group that doesn't fit the industry's default standard.

1.4.3 Deconstructing Design Assumptions

Design decisions are far too often built on unvetted intuition. They rely on "gut feel" instead of hard, lived data (Born et al., 2024). These starting points are never neutral. These foundations aren't empty; they're loaded with the baggage of legacy industry standards and systemic bias (Falevi, 2026). Without a sharp—even hostile—interrogation of these starting points, designers just end up dressing up historical biases embedded within contemporary systems. It's the same exclusion, just with better branding. The surface looks modern. But if the underlying logic stays unexamined, exclusionary patterns will simply repeat under a different name.

1.4.4 Urgency in an Automated Landscape

This topic becomes even more important today because of how fast technology is growing. Things like AI and healthcare systems are now part of everyday life, and they affect a lot of people (Wang et al., 2025). Because of that, any bias in their design can have real consequences.

For example, AI systems trained on limited data may not work equally well for everyone. Similarly, healthcare technologies may not fully consider all types of users (Yang et al., 2024). These issues show why it is important to think more carefully about design and not just assume that one solution works for everyone.

Overall, these gaps show that HCD still needs improvement. It is not just about designing for users, but about understanding which users are being considered and which are not.

1.5 Research Objectives

This research aims to identify how gender bias persists in modern design, particularly within Human-Centred Design (HCD). Although HCD is built to prioritize the user, the framework frequently misses how identity shapes a person's experience with a system. This study looks past those basic claims to find where the real gaps are.

- **Evaluating Theory:** One objective is to see how feminist ideas can help find the flaws in traditional design. This research focuses on power and representation—topics that are usually ignored in standard design steps (Ziaee, 2022). The aim is to understand how these ideas can make design more inclusive from the start.
- **Analyzing Real-World Use:** The study also looks at how feminist design is actually used in real projects. By reviewing existing cases, the research will check if these methods actually work better than traditional ones at creating fair systems (Luna, 2017).
- **Improving the Process:** Finally, the paper suggests ways to update HCD methods. Based on the problems found, the goal is to offer clear steps to make design more aware of diverse life experiences. This means moving away from "average" user assumptions and considering a wider, more realistic range of people.

1.6 Research Question

How do feminist and intersectional perspectives challenge the “default male user” assumption in human-centred design, and what methodological shifts are required to create more inclusive and equitable design outcomes?

The "default male user" remains a persistent bias in various design sectors. There is a frequent mismatch between actual user needs and the solutions provided. While many products are marketed as “unisex,” they are rarely neutral in practice. These designs often rely on male physiological standards as a baseline,

with only minor adjustments made for other groups (Mason & Kuttal, n.d.). As a result, these items may appear inclusive but fail to function effectively for a diverse population (Glass & Lum, 2025).

This issue extends to physical infrastructure. Stairs, for instance, are a standard design choice based on the assumption of a specific type of mobility. This leaves individuals with disabilities without viable options if ramps or elevators are not integrated into the initial plan. Such decisions demonstrate that design is often built around a narrow, idealized version of the "average" user (Born et al., 2024).

Research also indicates that different groups perceive inclusion differently. A study involving Purdue University found that women often show a stronger awareness of their own group's needs compared to men, who may show less automatic in-group preference (Rudman & Goodwin, 2004). While not a direct commentary on design, this suggests that the identity of the designer or researcher can fundamentally change how "inclusive" a project feels.

Treating all users as a uniform block often results in accidental exclusion (Born et al., 2024). Feminist and intersectional frameworks counter this by showing that user diversity cannot be captured by a single standard (Mirsch et al., 2026). This shift means design must move away from assuming universal needs and focus instead on actual fairness. This requires a shift in methodology where designers actively question established industry habits rather than following them by default.

1.7 Structure of the Study

This study is structured in such a way that it gradually progresses from review of basic understanding, analysis, application to conclusion and future scope. The structure is logically ordered such that each chapter relates to the next rather than being isolated.

Chapter 2 starts with the fundamentals of Human-Centred Design (HCD). It describes what HCD is, its historical evolution, and the contexts in which it is most often employed. This chapter also discusses its strengths and weaknesses, which is critical because it lays the foundation for the rest of the research. And Chapter 3 after that, looks at gender bias in design systems. Overview of the Chapter — This chapter examined gendered design including product design, safety systems, and examples of the “default male user” in real life

Feminist theoretical perspectives in design are then introduced in chapter 4. This defines core concepts of inclusion, intersectionality and ethics of care, revealing the differences between these ideas and traditional design thinking. In Chapter 5 the discussion becomes more critical, expanding from this point to explore what is hidden in HCD and acknowledging biases that are concealed in processes of design.

The sixth chapter moves to practice with a discussion of feminist methodologies in design. It encompasses guidelines such as participatory design, co-design and inclusive research practices. The subsequent chapter 7 looks at real-world applications of these ideas — particularly in fields such as digital and health technologies that are already being implemented or tried out.

Chapter 8 expands upon this by examining gender and trust in new technologies (e.g., AI, autonomous systems). It emphasizes different types of users' perspectives in relation to these technologies. Following this, Chapter 9 highlights the complex realities of implementing feminist design in practice, with institutional and cultural barriers.

Finally, chapter 10 wraps up the whole analysis with some conclusions, possible recommendations and a way forward. And it brings out the shift away from considering one type of “user” to different kinds of users.

In general, this study groups the literature thematically (theory > critique > application > future) This stru-

ecture allows you to see not only why the problem is important but how to solve it tactically.

Chapter 2: Foundations of Human-Centred Design

2.1 What is Human-Centred Design?

2.1.1 Definition and Core Principles of HCD

Human-Centred Design (HCD) is an approach that puts the people who will use a product or system at the centre of design activity. Rather than focusing only on technical aspects, it attempts to find out the user, their needs from a product and how exactly do they interact with something in real life. In essence, the concept is very straightforward: design should serve people and not vice versa (Introduction to human-centered design, n.d.).

When talking about HCD there are a couple of flavours you'll usually encounter. One of these is empathy, or the simple yet effective act of putting yourself into the shoes of your users and seeing what they go through and what problems they experience. Next is iteration: the idea that a design isn't correct on the first try and will continue to be repeatedly tested, refined over time. Usability is also essential, as it deals with keeping everything easy and accessible to work. In combination, these ideas help create designs that will end up working in real life.

2.1.2 Application in Global Health and Technology

HCD is ubiquitous within this ecosystem, and its applications are seen across disciplines both in global health domains as well as technology. In health care, it simplifies systems and tools for patients and professionals alike. This could be for example medical equipment, health applications and even optimisation of hospital operations. Specifically, the idea is to improve healthcare accessibility and usability (9), especially among people with little technological know-how (Vannelli et al., 2024).

The same is applicable in technology where HCD is employed whether one creates websites, mobile apps or software systems. People from different backgrounds use these systems so the algorithms must be interpretable. Also honing in on users lessens errors and better the experience overall (Hanak, A. 2026).

2.1.3 Role in Solving Real-World Problems

This is where HCD becomes practical; it gets to the root-cause of real-world problems because it is based on actual user needs instead of assumptions. Many systems are doomed because they were designed without a knowledge of the humans that will use them. To combat this issue, HCD attempts to involve the users within the design process and iterates the designs based on feedback from actual use – (Human-Centred Design: Process & Techniques 2024).

And that technique is being used in education, healthcare, transport and a great deal of social services. The solutions tend to work better when real user experiences are taken into account. It also helps identify issues that you may not see in the beginning.

2.1.4 Claim of Universality in HCD

Oftentimes, HCD is described as universally applicable — good for all users and in most situations. It appears to be both a very flexible and utilitarian idea (Norman et al., 2022). In practice, though, these things are by no means so cut and dried.

Users are not equal users and their needs can vary due to culture, gender, ability or environment. This can overlook vital variations, since one approach cannot be assumed to suit everyone. This is where it begins to see criticism of HCD too, particularly when it externalizes numerous perspectives and fails to round out the work. HCD is supposed to be universal, but following it in the real world does not yield really the desired results (Kaplan et al., 2023)

2.2 Evolution of HCD in Practice

The shift from Human-Centred Design (HCD) has come a long way over time. First there was even more emphasis on user-centred design: basically, designers attempted to understand users and build systems that catered for their needs. Yet in many cases, users were still not directly involved in the design process. Researchers would study the users, but ultimately decisions were still in the hands of designers (User-Centred Design – an Ergonomist's Viewpoint, n.d.).

Eventually, this way of working began to evolve towards participatory design. Designers stopped only watching users, and started engaging them. Users were now not just observations you might run a study on, but stakeholders in sharing their own experiences. This encouraged a collaborative design process which produced solutions that more accurately matched real user needs (Wacnik et al., 2024).

Widespread practices centred around inclusivity and co-design also emerged. Co-design is about designing with users throughout the entire process instead of introducing them at one stage only. Inclusive design is focused on users many consider fringe, those often missed like people with disabilities and people from different socioeconomic backgrounds. It lead to a more flexible and diversity-sensitive approach within HCD (Clarkson, P. J. & Coleman, R. 2015).

Another key influence is design thinking frameworks. These frameworks brought a more structured approach to problems, often consisting of stages that included user research, problem definition, ideation, prototyping and testing. Though they helped formalise the process, they also made HCD more widely adopted outside of design industries (The Knowledge Academy, n.d.).

Simultaneously, user experience (UX) has become more important. In the past, it was simply about whether or not a system worked, now it's changing and it needs to be observed how does it feel while using it. Aspects that can play a structural role in improving design such as usability, satisfaction and user experience have emerged. As a result HCD in the present day means not only functional but more meaningful and positive (RASHID, M. 2025).

2.3 Strengths of Human-Centred Design

This is just one of its strengths, which is why Human-Centred Design (HCD) techniques are used everywhere. The greatest benefit is the increased usability and improved access to products. As the emphasis is put on users, designs are often simple and easy to use. This is particularly crucial for those that may not be technically minded or have different accessibility requirements.

HCD also forces you to be more empathetic, and that sense of understanding for your users. Designers seek to view problems from the user's perspective; that is focusing on what you assume might be wrong — and critically distancing yourself from it. It invariably gives rise to solutions that seem more sensible and realistic.

HCD also supports iterative problem-solving. Designs are tested and refined iteratively (rather than assuming you'll get it right the first time). Feedback is key in this process, since it is how designers can iterate upon the experience of the users. It is a much lengthier process but often yields better results.

Moreover, HCD is highly flexible and can be used for various industries. Historically, it has been applied in fields such as healthcare, education, technology and even public services. It can be adapted to fit various types of problems and contexts, because the core concept is very simple in nature on focusing on users.

2.4 Limitations of HCD

Although Human-Centred Design (HCD) is a common practice, it comes with some critical drawbacks. One of the key problems is that it typically assumes a “generic user” — Often, the term user is used interchangeably, and users are treated as one group — without considering larger differences such as

gender, culture, ability or background. Hence this leads to oversimplified user experience, not all types of users are fortunate enough during the design process (Velsen et al., 2022).

Another limitation is that when practice does happen, marginalized voices are often overlooked. Although HCD claims to include the user, in practice specific users are included who are not always a diverse population (Human-Centered Design for Global Health Equity, 2017). This may be the case due to practical issues such as time, resource or accessibility constraints, but leads to incomplete consideration of specific groups (Born et al., 2024).

Again, it heavily relies on designer interpretation of user needs via HCD. Although there is user research, designers have to make decisions according to what they can understand based on that data. This opens up the possibility for subconscious interpretations of values to inform the final design (pp.104-113 of Book – The Limitations of User-and Human-Centered Design in an eHealth Context and How to Move Beyond Them, 2021).

Finally HCD does not necessarily tackle broader systemic injustices. It is more about the refinement of specific products and systems than interrogating other social or structural aspects that order them. It is for this very reason that some of the most underlying issues can remain unaltered, even though the design itself may improve (Velsen et al., 2022).

Chapter 3: Gender Bias in Design Systems

3.1 Minigendered Design and Product Language

Many products are innocuously gendered with different social cues (while the function of the product itself does not vary in the least). Here the language of advertisement is playing an important part. Products for men are frequently tagged with words such as “power,” “fearless” or “adventurous.” When even a facewash is Pseudonymed like TurboBright, which, in all honesty and fairness, says little about the underlying product but provokes an imagery (Lowrey, 2021).

Conversely, the products designed for women are usually referred to as “delicate”, “soft” or “light”. These products are more about looks and packaging. They are also more expensive while providing less quantity in many instances, thus putting their position in the market into question (Moshary et al. On the other hand, it is manipulated to become more appetizing – again reflecting some sort of expectations coming from users (Gender and aesthetics: A study on preferences in product design, 2026).

That difference extends beyond marketing into the actual physical design of their products. For instance, in jeans or pants, men are typically offered larger more functional pockets while women often get smaller ones or go pocketless altogether (Development of Innovative Pockets for Womens Workwear, 2021, pp. 257–261). This is a detail you might overlook easily, yet it elucidates precisely how assumptions regarding use affect design decisions.

This can become quite apparent in the area of colour. The color pink is commonly associated with girls, blue, boys say this in context to the practice of gender reveal Imam 2016; Gieseler, 2017 However, there was a time that this was not the case. A hundred years ago, the reverse was true: pink for boys, as bolder and stronger colour; blue softer, and more feminine for girls. This change indicates how these changes are not inherent and rather, come about through time within society (Gendered associations of pink and blue, 2024)

The question is what changed? What happened that turned everything upside down?

- **1900s begin-ing 1920s:** Equality of some pink for boys and blue for girls in many sources, or no hard rule. (Grannan, 2023)

- **Changing Colors in the 1940s:** Marketers reinforced pink for girls and blue for boys—the big-selling gender color scheme of "baby boomers. (Grannan, 2021)
- **The 1960s–1970s dip** A push for women's liberation (and unisex baby clothes) briefly diminished this gender-coding. (Parviainen, 2025)
- **1980s Comeback:** Another round of the trend hit hard, aided by prenatal testing that told parents whether their baby would be a boy or girl as early as 14 weeks into pregnancy, allowing shoppers to purchase gender-specific goods. (Barnes, 2013, pp. 616-630)

It clearly shows that design and marketing cannot help being influenced by the biases casted upon it. Cultural concepts and ideas influence these perceptions, what users see in products, and whether they feel that this product is for them or not.

3.2 Ergonomic and Safety Biases

3.2.1 Male-people ways to the design of transport and safety systems

For example transportation and safety are some of the fields where many systems were designed with men being considered as typical user. When it was first designed, men were expected to be users of the product early on and that assumption remained for quite a while. As a result, most defaults for features, metrics, and safety equipment were aligned with the average male body.

Across the generations, women have also become just as involved in areas such as travel, work and driving due to society changing; however design standards haven't always followed suit. For instance, crash dummies representing the average male body are still commonly used to test car safety systems. (Administration, 2023) This implies that the disparity of female composition are not always appropriately taken into account.

3.2.1 Higher Injury Risks from Design Bias

Such design decisions can result in genuine safety hazards, especially for women and other marginalized groups. (Eg Fautsch & Krainin, 2023) In contrast, this applies to men's bodies; e.g., safety equipment for cars such as seat belts are aligned with the average male body. For some women this may be uncomfortable or not feel secure (McMurray, 2025), which impacts the extent of how effective safety system is in practice.

The same problem is compounded by crash testing. Because most crash test dummies are designed from male body perspectives, the information compiled is not necessarily representative of how accidents impact women. (Moritz, 2020) Thus safety systems may not always protect equally well.

This demonstrates that design is not only about functionality, but who then gets to be designed for. If some groups are under-included, risk may be inequitably spread so that some users are more vulnerable than others.

3.2.3 Instance from Vehicle and Work-Tool

This becomes especially clear when you look at both vehicles and tools in the workplace. One of the most ubiquitous examples you find in automotive—seatbelts and airbags. Because they are tested on male-based crash dummies (and therefore, do not always work with or protect women the same way). An example of such consequence would be that a seatbelt may fit differently on the body, becoming less comfortable or even ineffective in some situations (Wood 2022). Everything from the distance to the steering wheel — where you usually put your feet for pedals and all that kind of thing — is typically designed with an average male body in mind. (McFadden et al., 2000, pp.676-682)

Workplace tools show similar patterns. Most tools, particularly construction or manufacturing, are made

for larger hands and upper-body strength. (Woody et al., 1993, pp. 299-311) Because of these physical assumptions it can be more challenging for women or other bodies that fall outside these expectations to use them effectively. It can even become a cause of injury, sometimes as the tool is not designed for many different types of users. How women struggle with Androcentric bias in surgical equipment.), 2024, pp. 106-110)

This might be even more important when it comes to personal safety equipment, like gloves, helmets or protective gear which may not fit well for everyone. If something is too loose or too tight, it doesn't protect you to the level it should. This is to say that something as simple as a seemingly innocuous design decision may have significant safety and usability implications (Stobbe, 1996, pp. 531-543).

In a lot of ways, these examples illustrate that when design is considered based on an inaccurately narrow idea of the “average user,” and can potentially put others at risk. It also points to the importance of being inclusive of different body types and abilities when designing systems and tools.

3.3 Gendered Usage and Meaning of Technology

Many view technology itself as neutral, but in reality people do not feel it that way. How one uses or understands technological devices can vary by gender, location (Qazi et al., 2022, pp. 4225–4258) That's not as much about who doesn't know how to use it better or worse, but about what everyone is accustomed to and comfortable with.

Culture shapes the ways of using technologies, often without people being aware. Certain regions accept same-sex interaction more than others so on different platforms people are more vocal. In situations where this is constrained, people may use similar platforms in different ways (Kettrey et al., 2024). Technologies are not distinct from society; they tend to evolve with societal change.

Some concepts associated with masculinity and femininity influence whether technology products are seen in certain ways. Certain tools or systems are often viewed as being more “technical” or “complex,” and these are typically associated with masculine characteristics. Concurrently, platforms for communication or social interaction are often assigned a different treatment (Gender identity and influence in human-machine communication: A mixed-methods exploration, 2023). Yet they are not rigid entities, and they nevertheless inform behaviour.

This however is the reason why tech adoption is not uniform across all. And some of these people are more comfortable using specific systems, while others may find them unrelatable and thus abstain from use. This can influence how frequently various demographics use particular forms of technology as they advance through time (Matobobo, 2026).

Thus even when technology itself is not gendered, the patterns of human response are adapted to social conventions (Ron et al., 2025). But this is an issue designers need to consider more thoughtfully.

3.4 Default Male Body in Design

3.4.1 Make Male Physiology the Default Design

This has resulted in many medical and product designs being based around the male body, without this stating it outright. It prefers the male body as default and everything else is built around that. Healthcare systems, safety components and even wearable devices can reflect this. (Hutchison, 2020, pp. 570-591)

The catch is that this does not reflect real-life users. Everyone is not built the same, and it shouldn't be expected that everyone's body works in the same way. However, many still stick to older standards with their designs. In fact, clinical research has often focused more on male subjects than female ones – even

when the results are intended to apply to all of us. This leads to some significant differences being overlooked (Plevkova et al., 2020).

3.4.2 Healthcare and wearable consequences

We can see a similar problem in other pieces. In the case of medical research, almost all drugs developed historically were tested on men although there were intended for use by women. Everyday infrastructure magnums, such as stairs, also relegate similar physical capabilities to all users of those infrastructures when not needed (Chilet-Rosell, 2014). (Edwards et al., 2019) Designs like this may not be accessible to people with mobility issues or will be more difficult to use. These examples illustrate the continued prevalence of systems designed with a narrow concept of the “standard” or typical user in mind.

Something like this can also be seen in the case of wearables. Things such as fitness trackers or smartwatches are not always equally accurate for everyone. This may not seem like a huge deal on the surface, but over time it can change how people view their own health—(Doherty, 2024) This could even be as simple as fit or comfort level.

3.4.3 Insufficient Representation in Testing Data

This creates another problem: the wrong representation in testing. While there are numerous studies that have previously examined a handful of people, none appear to have been able to gather any conclusive amounts of data. (Weber et al., 2021) For this reason, the final design is based on an incomplete understanding.

The system may function well for one group, but not others if various groups are excluded. Not by design, but it is problematic in terms of usability and safe.

3.4.4 Relation to Larger Systemic Bias

This, if you examine closely, is not only about individual products. It relates to a bigger trend in design and research. This frame of thinking — that this type of body is the default — points to how normalized certain assumptions over time are. (Wallis, 2021)

These assumptions are often not challenged, which is why same issues have been experienced time and time again. Which means rather than thinking in terms of some ideal “standard user,” you start to think about different types of users from the ground up.

Chapter 4: Feminist Theoretical Perspectives in Design

4.1 Feminist Theory and Design Thinking

4.1.1 Introduction to Feminist Principles in Design

Feminist theory is quite unique. Approaching design from a different idea, through concepts such as equality, inclusion and the questioning of power. Rather than assuming systems are neutral, it questions who is part of the design process and who is excluded. It also aims to understand how other groups may have been overlooked or worse so, merely by accident.

And one of the main concepts here is inclusion, which means that from the beginning, you have to think about all types of users and not later in time. There is also equality—not treating everyone the same. It is less about making sure that various needs are actually acknowledged. There is also a critique of power: Who decides, and whose view prevails? (Costanza-Chock, 2018)

4.1.2 Application in Design Processes

If you involve different perspectives in the design process, it can actually influence the outcome — what it looks like and how it's structured. Design decisions were typically a matter of designers, but nowadays the attention is shifting to users too, especially those disabled groups traditionally excluded. Often these

participatory design methods are applied in order to allow users to actively engage in the work process versus simply being observed (Wacnik et al., 2025).

This approach not only makes designers reevaluate their own assumptions. Instead of taking for granted that what they have done before or so-and-so from another organisation is right, they should question whether their methods are inclusive or otherwise. This is not always easy to do, but it often results in more versatile solutions that adapt better towards various types of users.

4.1.3 Focus on Marginalized Voices

An integral element of feminist design thinking also encompasses the spotlight on marginalized voices. These are groups that traditional design processes tend to not fully represent— such as women, people living with disabilities or those from different social or cultural backgrounds. (Molinar, 2015)

Design now is more grounded in lived experiences when you include those voices. It furthermore assists you to identify operations not carried out in violation of the law, otherwise typically overlooked. This does not imply that design gets way more complex, rather I believe that it becomes aware of different perspectives and various lifestyles of users.

4.1.4 Contrast with Traditional Design Thinking

Traditional design thinking is often presented as neutral and universal. It assumes that good design can be universal. On the other hand, feminists argue that no design is ever really neutral, and this is problematic for the purpose of this study. (Costanza-Chock, 2018)

The truth is, design is a part of society and culture and politics. The definition of ‘normal’ or ‘standard’ extends only to a select number of users. For this reason feminist design thinking advocates for a movement away from broad assumptions and more towards approaches that are inclusive and reflective.

4.2 Intersectionality in Design

Intersectionality is, simply put, the idea that people are made up of multiple identities and you can never just look at one (like gender). It is not gender or race or class or background, but a composite of the two (Brünig et al., 2024). This is why folks are less likely to engage the design similarly, even when they are using the same product (Ziaee 2024, pp. 1109–1120).

This can be better understood with a quick example. Consider a scenario in which there is just one model of Tee shirt, accessible anywhere (in one size say large) in just one color, for example neon blue! It would pose a challenging sight when almost nobody has the same build and tastes. In the same vein, designing systems around one average type of user does not serve diverse sets of people (Soldatic et al., 2025).

This is also an aspect of whom really needs accommodating. The voice of everyone does not carry equal weight. For a great number of cases, voices from more privileged background are admitted compared to others that lose their representation (Ziaee, 2024, pp. 1109–1120). This makes it difficult to assume that all users have a similar experience (Szlavi et al., 2023).

One of the first indications of these differences is the real world instances of Paragraph 66's garbage. As a case in point, iPhones come with wallpapers that reflect various communities such as those designed around Black culture and then also around LGBTQ+, 2024 Apple releases its 2024 Pride Collection— Shining the light on LGBTQ+ communities. However, even then not all users can relate to such representation and therefore it cannot encompass all user experiences. (Ulnicane, 2024, pp. 1-12)

A similar problem presents itself in the physical infrastructure. In India trains majorly employ stairs as a primary boarding method (Bose, 2025). However, this design can be quite difficult for someone with a

disability to use. They sometimes have to rely on others even for basic needs like boarding the train (Kushwah & Maurya, 2025, pp. 571–588).

In short, unless you have used users themselves to lay out the path because no two user is the same and their requirements cannot be equated to a single line of code. If design is to be inclusive, it must reflect the diversity with far greater confidence, Consider Present (Mikus & Rieger, 2021, pp. 13-31)

This problem is particularly evident in health care. Medical tests, for instance, are often performed on males instead of females. (Plevkova et al., 2020) One often-cited reason is that female bodies, even the female mice in research studies, have cyclical hormones which complicate testing. In fact, this complexity is rarely illuminated but rather evaded (Caruso, 2023). Consequently, the results may be less generalizable to women and this has implications for real-world effectiveness of treatment. (Leonard, 2021) This is in a sense indicative of the fact that some populations are more likely than others to be underrepresented in research (even when benefits would ostensibly accrue to everyone).

The same goes for digital systems. Even at their best when designers consciously try to be inclusive problems arise — issues of representation. (See: The Use of AI in Health and Social Care — A Systematic Review (Investigating Inclusion) usage diversity as it uses identification, ie. Pride features et cetera may not represent the variety of users.) (Gender and aesthetics: A study on preferences in product design, 2026) This indicates that inclusion cannot follow a single solution as not everyone connect with the same symbols or representations. (2026, Trends and Approaches in Inclusive Graphic Design: systematic literature of review)

Humans are heterogeneous," their preferences differ. Different people have different color preferences, different design choices and not everyone has the same needs. Some may identify with certain characteristics, but will not self-identify as one at all. People are generally just different.

This is why it is not actually feasible to create a one size fits all solution. (Henni et al., 2022) These differences are often overlooked by treating users as a single collective. Design needs to recognize that users are complex and multi-faceted. Often by taking the complexity into account one ends up with systems that are more flexible and inclusive.

4.3 Feminist Ethics of Care in HCI

4.3.1 Design Thinking, Careful

Structural Adjustment and Feminist Ethics of Care in Design: The Value of “Caring by Design” Instead of a focus on the fast truth, this approach asks designers to consider people, their contexts and the effects design decisions have on them (Croon, 2022, pp. 232–246). Now it is not about being efficient but also the process with respect to relations and responsibilities.

Here in this recognition of the multi-dimensionality of care, it is not merely the word in terms of kindness, but also how systems are created and then used. This includes deeper insights about users and design for their daily lives.

4.3.2 Empathy, Responsibility and Relational Design

This method highlights compassion, accountability, and connection. Empathy is a tool that helps designers understand what does the user goes through not just on surface level but in deep meaning. When designers realize their decisions have real-life concrete implications for the people who use their products, this is where responsibility comes in.

That also requires relational design. It emphasises the relationships between users, systems and their environments. Rather than consider users as independent entities, this approach views how people engage

with each other and the system in totality. (Kravchenko & Doty, n.d.) In many cases, this makes for more considerate and practical designs that meet real life.

4.3.3 Safety and Well-being in Design

The focus on safety and well-being is another important aspect of feminist ethics of care. Decision making is one part among many that designing something usable, and more than just the design so users feel (the three clinical SSS): seen safe supported by use of it. Physical safety can also mean psychological and emotional well-being. (Henriques et al n.d.)

But simple features — such as how privacy options, reporting of harassment, or control by users are implemented — in digital systems can be significant. When these elements are not taken into consideration, users will sometimes feel uneasy or even more unsafe. Which means to think carefully about how the design might play different roles in ensuring safety and empowerment for users.

4.3.4 Contrast with Efficiency-Driven Design

This stands in stark contrast to traditional design models that center only on performance and efficiency. More often than not, these systems are built for speed, efficiency and productivity—sometimes without consideration of how that impacts users.

This is challenged by the Feminist ethics of care, whereby it states that design should be efficient, but also include responsibility. (Lindemann, n.d.) It raises the question why speed and performance should always be about prioritisation when such kinds of commitment affects user-related issues.

4.4 Queer and Phenomenological Approaches

4.4.1 Introduction to Queer Theory in Design

Queer theory is a post-structuralist critical field that is broadly associated with the exploration and theorisation of gender and sexual practices outside heterosexuality and heteronormativity (Meyer, 333). Drawing on developments in sociology rooted in social constructionism, queer theorists often take nationalist views of sexuality and gender to be essentialist. Instead of being seen as fixed categories, queer theorists approach sexuality and gender as social and cultural constructs; incorporating scrutiny on the ways they are represented through particular categories, language, and binary oppositions (Queer theory, n.d.),

Queer theory first developed as an offshoot of queer studies (formerly gay and lesbian studies) and women's studies in the early 1990s. It was formalised as an academic discipline by American feminist scholars Judith Butler and Eve Kosofsky Sedgwick. Queer theory has been shaped by French post-structuralist philosopher Michel Foucault and American feminist author Gloria Anzaldúa (Queer theory, n.d.).

This perspective inspires applying it to design by not pigeonholing users into categories. It can be said that user identities are not as easily categorized and should take users out of well-defined groups.

4.4.2 Challenging Normative Assumptions About Users

Design, traditionally, is predicated on assumptions of what “normal” looks like. These assumptions might be about gender, relationships, or user device habits. Yet, this isn't true for everyone.

Queer approaches challenge the notion of binary behaviours and demonstrate how users can not be fully understood within these fixed identities (McWilliams, 2016, pp. 259-274). Not every man is attracted to a woman, and not every woman matches what women should be. As a result, designs that rely on these assumptions may unknowingly alienate some users.

4.4.3 Lived Experience as a Design Input

Using lived experience in design is another key concept. The method relies on actual experiences of users instead of purely broad statistics or guesses. (When the intervention is designed by lived experience, 2026) Each of these experiences offers valuable learning where it is otherwise impossible to see patterns because often users are aggregated as one group.

Designers can learn how systems work in practice by paying attention to lived realities. This adds a layer of local-ness and relatability to the design (Kim & Lee, 2014, pp).

4.4.4 Relevance in Inclusive Design Systems

These approaches are crucial to construct equitable systems. With changing user identities, design needs to adapt too. For brands and designers who want to stay relevant, old assumptions no longer hold true.

This frequently means rethinking how products are designed and for whom. On the contrary, design should be more fluid, against different categories and against users. As a result, it creates more inclusive systems that are moving toward accurately reflecting real-world diversity (Youkhana et al., 2026).

Chapter 5: Feminist Critiques of Human-Centred Design

5.1 Limits of Traditional HCD

HCD is often portrayed as this user-centered design, but actually fails to include all users in equal measure. Often, the user is described in overly simplistic terms, and key differences between people are not accounted for. That is why some groups may still be excluded even when an initiative has such good intentions as inclusivity.

One of the most common problems is leaning too much into the myth of an "average user." The solutions are created based on the more typical of the usual users and general patterns, assuming that since this approach will work for most people. However, in real life no human is ever average. They have varying requirements, skills and expertise. So designs based on this assumption might work for some, but not for all.

It also inadvertently excludes marginalised groups. But when user research is conducted, the users may still not be diverse. Yes, sometimes this is practical (time available or due to resources reasons) but it still means that some voices are being excluded. This means that the final design does not represent those users' needs.

In a way it creates a one size fits all situation. The concept is that one solution works for all when, in reality, this is far from the truth. Like the examples shown, users are not the same and one way or other might fit as large a bracket in product design, healthcare, etc., where some system is designed — digitally or otherwise.

Although HCD is designed to be user-centric, it does poorly and excludes different types of people. Which makes it important to start thinking about how do you define the user, and whether all voices are really represented.

5.2 Invisible Biases in Design Processes

The manifestations of bias in design are not always so apparent. Hell, in some cases, it is often an uphill journey which way back at the very first stage like how data is collected? (Swiniarski, 2023) Sways and user exploration can be limited to small number of people even without any one observing it. Say for example if people belong from the same region, it means that this does not generalise all data. Due to this, the insights on which design is based may already be incomplete (Zhu et al., 2022).

The gap in this problem carries on when creating user personas. Whereas personas are meant to represent

users, they are just based on a set of assumptions captured in a simplified version. Rather than showing real diversity may simply show a fake “average user”. Because of this, significant distinctions between users get overlooked. (Joaquin, 2022)

The trick is that designers also assume while doing the process, oftentimes without knowing it. These assumptions could be related to how people behave, what they need or even what they can do. And even if these assumptions appear reasonable, they will not pertain to all users. These decisions, small at the beginning of every design project, eventually add up to create the final product (Marriott, 2026).

This is also why bias doesn't remain at a moment; it becomes the system. When that gets integrated into a product or a platform its affect in the same way does not stop. This also makes it harder to catch and resolve later, since it fades from being a problem in itself and instead becomes part of how the system operates. Below is an overview of the rewrite: (From Obvious to Delightful: Making Products for Real Humans 2026)

5.3 The Myth of Neutral Design

Design is often talked about as something neutral, but it is never completely free from influence. (Structural oppression and AI: A systematic review of data policy frameworks in India, 2023) Each design decision is influenced by assumptions about the user or their needs — if not explicit, at least implicit as how something is supposed to work. (2023, ks 519-528) This has the effect that design is a reflection of the values and perspectives of those who design it — not always in a desired way.

But it also has to do with culture, power, and social structure. What is deemed as "normal" in one context can be very different in another — (Structural oppression and AI: A systematic review of data policy frameworks in India, 2026) Typical was their reliance either on their own experience or dominant ideas that ultimately influenced the design (Zhang & Wakkary, 2014). Hence for the most part certain groups tend to be prioritized over others and other less important or totally ignored. Structural oppression and AI: a systematic review of data policy frameworks in India (2026)

This influence can be observed in both physical and digital systems. A common example can be seen in clothing design. Women's clothing is often shaped not only by functionality but also by social expectations and fashion trends. In some cases, winter clothing designed for women may prioritize appearance over warmth, while during summer, garments such as sarees or long dresses can be heavy and layered despite hot weather conditions (Why Sarees Are The Smartest Style Choice This Season: Six Yards of Summer Magic, 2026). At first glance, these choices may appear to be matters of personal preference or fashion. However, they also reflect broader social norms and assumptions about how women are expected to dress and present themselves. This suggests that design is not driven solely by function or practicality, but is also influenced by cultural expectations and societal values (Košira & Lakshminarayanan, 2022, pp. 69–88).

This same pattern can be seen in digital platforms and AI systems. Algorithms are trained using historical data, which in itself may be biased. This means that their outcomes will not be purely neutral. This is because recommendation systems, hiring tools or even search results can amplify the inequalities from the past instead of offsetting them (Kasy 2024) (Ip, 2025).

Real-world consequences can arise from ignoring these biases. This could result in systems that only benefit a specific subset of users, or ultimately even the potential for discrimination. In the long term, this does not assuage inequalities but crystallizes them (Kasy, 2024).

What this means is that design has a nonneutral nature in practice. Culture, power and context all influence it and if more inclusive systems are to be created this insight needs to be recognised.

5.4 Need for Reflexive Design Practice

Reflexive design practice requires examining the how and why of design decisions as they emerge (Atman, n.d). Designers do not simply implement the process, rather they deliberate on the choices their making and inherent assumptions of how those choices would affect others. It is essentially thinking about design while doing design, instead of only thinking about it once that design has completed.

An essential to that is questioning assumptions. In such a situation, designers often take decisions based on what they think users feel need, but wrong at times. Many times these assumptions are formed either due to our very own experiences or due to practices that have been deemed standard practice. Reflexive practice helps designers to stop and question whether or not these assumptions are true for all users. The principles of reflexive practice (2014, pp. 1–17).

This would also be keeping a check on bias. Bias is not always very obvious, it can be introduced into the design process at any stage from research to implementation. This makes it necessary to continue evaluating decisions rather than enforcing the assumption that design is complete or fair (Ruelas et al., 2021). This is not a one-and-done and instead needs to be completed along the way.

Another key aspect is accountability. Designers are not only designing systems but also the interactions between people and those systems. In response, they are obligated to own the consequences of their designs (Gray, 2025) pp. Of course if a system injures or celebrates excluding some users, they should be aware of that and adjust their systems. Design ethics: Reflecting on the ethical dimensions of technology, sustainability and responsibility in the Anthropocene. 2018 (pp. 184-200)

So, reflexive design is about improving the design inherently also; it is about being more conscious and responsible and a little bit more malleable. It moves the focus from creating solutions to exploring the broader consequences.

Chapter 6: Feminist Methodologies in Design Practice

6.1 Participatory and Co-Design Approaches

Participatory and co-design principles are aimed at bringing the voice of user more directly into the art of design. This means that users participate in various stages, such as idea generation or testing instead of everything being decided alone by the designers. They are not simply the observers; they actually participate in forming what work is produced.

This holds more when the discussion is about underrepresented groups. These groups are frequently excluded from key considerations in design decisions (Wacnik et al., 2025). This is exactly where participatory methods are attempting to intervene. They allow individuals the opportunity to speak of their own experiences, which otherwise may not have come out. And sometimes, those experiences seem to turn the design on its head entirely (Jones et al., 2025).

Another thing is shared decision-making. Decisions don't sit solely with a designer when users are involved. They are born from conversation, feedback, and in some cases bewilderment or contention. It just slows it down a little bit, maybe. However, at the same time it often produces something that is more functional than what they found in the world (Wacnik et al., 2024, pp. 1-20).

Feminist design work also gives examples of this. Often, local communities — and women in particular — have played a role designing tools/services they actually use. In other domains, co-design has been used in digital platforms to improve the usability for diverse groups. (Marques et al., 2018, pp.1-15) It is not ideal but shows that engaging users are doing better. Published a study that updates this guideline covering data up to October 2023 (Clemensen et al., 2025, pp. 1193-1200).

6.2 Feminist Staging and Design Interventions

At the same time, feminist staging is a means to contemplate what already exists rather than accepting it as inevitable through design. Instead of going through the normal channel, (Wu and Buker 2024, pp. 327-345) tried to highlight things that are usually ignore (Feminist Design Theory, n.d.). At times you may not even be solving the problem immediately. Sometimes it is only about the perception, or visibility of it. Because of that, the method may seem somewhat experimental. By no means are designers certain where it will go but they will play around with its possibilities. It does not always go in a straight line. That could be a little tricky. It also assists in approaching the problem from other angles.

Another aspect of that is building alternative scenarios. Designers can think of situations such as “what if it worked in a completely different way. Not all of these interventions are practical or conceivable solutions, but they do provide insight into what could be altered (Eriksson et al., 2021, pp. 1–15). In others, they reveal complexities that were previously invisible.

Thus innovation often does not arrive from efficiency here. It usually starts by changing the usual mode of thinking. This form of disruption will not yield instant results, but rather an enduring shift in understanding design problems (Whipps, n.d).

6.3 Care-Centred and Inclusive Design Methods

Carecentred inclusive design tactics are less about the system delivering results but rather how those people experience a system. This method is more than just function but also health, comfort and not creating that sense of fear that begs whether users feel well-when using it (An et al., 2023).

That's a large part of safety, which is tied into trust. And that, at the very least, is something that people have to feel: that a system will not harm them and cannot exploit their data. Little things, such as privacy controls or reporting options in apps, can make a difference. Without these, the best system will not be feel safe to use (Huckvale et al., 2015).

Another thing is emotional well-being. Design isn't just about what people do, but also how they feel (or don't). Some systems might be fine from a technical standpoint, but end up being laced with tension and confusion. That sort of experience matters as well, even if it cannot be measured all the time (Figuerola et al., 2026).

Inclusivity is also important here. People, well they are different, and not everyone has the same requirements. This means, it is never successful to design for just one kind of user. Not all will make it in but designers have to at least try and iterate away different users from the start (Chen, 2024).

This can also be spikes from health and safety systems. Healthcare apps are now beginning to use simpler language that even the layperson can understand. In digital realms, emergency contacts or reporting tools are included to support users. They are small, but it matters (Laila, 2026).

Because this is about facing a problem solving approach not the fast way to solve. Much more about ensuring people feel supported when using the system, even if that costs a little effort.

6.4 Gender-Aware Research Methods

Gender-sensitive research methods work towards understanding users as diverse individuals rather than a homogeneous group. Before the millennial change, users were frequently generalized and not properly considering how a user may interact with systems by their gender, background or personal experiences. With time, it became obvious that this type of analysis could overlook critical elements; thus, gender-aware and inclusive research methods are now receiving greater emphasis (Stumpf et al., 2020, pp. 1–69). This has manifested itself in, amongst other things, survey design. It is common to use surveys for data collection from users, however, how the questions are written is very important. The options that you

provide may be too few or based on assumptions, and people cannot answer properly. In some instances, users are compelled to pick answers that do not accurately reflect their identity. Because of this, it is important to structure surveys that allow for greater flexibility and clearly represent actual experiences (Asking about Gender and Sex in Surveys, n.d.).

Another way to think about this is user personas. They are called personas, and they can be used to simulate various types of users during design, but using only one kind of perspective may lead you to an unrealistic persona. Without diversity they may altogether exclude certain groups from these personas. Thus to able make them more useful and closer to actual users different genders, backgrounds and situations are including (Abascal & Azevedo, 2007).

It is here where qualitative methods start to come into play. Techniques such as interviews, observations or even personal anecdotes allow to get a sense for how users really interact with a system. These methods are less standardized than surveys, but they provide richer information. At times, users verbalize things that are not shown in numbers and therefore, can provide insights into potential issues that could go unnoticed (Blandford et al., 2016).

It all plays a role into how design decisions are made. The type of research that is utilized directly influences what is designed and who it is designed for. If there is a limitation in research design, it will also reflect the limitation. When designers include new perspectives, the system becomes a tool that serves a broader segment (Eriksson et al., 2025).

Gender-aware research is not simply data collection at the end of the day. It is more about getting to know users right — in a way that signifies genuine distinctions. This aids in developing systems that also are effective, but equitable and applicable to various individuals.

Chapter 7: Applications in Digital and Health Technologies

7.1 Feminist Perspectives in Digital Health

Usually, digital health technologies such as healthcare apps and online medical systems are easily considered a tool with inherent functionality for services to work. However, that is not always the case in real life. Often, these systems are made from general assumptions and don't account for variances between users. In the past, much of healthcare research was done on male bodies and experiences than female ones – even lesser known is that this has an effect of how many digital health systems are built today. (George et al., 2018)

It reflects in the healthcare apps as well. Most of these apps do not correctly incorporate women's health requirements. For instance, this could mean that symptoms such as menstrual cycles or hormonal changes or reproductive health are left out or considered an externality to the main system. (Bucher et al., 2025), these applications might not completely accommodate all user profiles the same way.

Additionally, this highlights a lack of representation. The model may not work for everyone equally well when data used to develop these systems would not have enough diversity (Hasanzadeh et al., 2025). For instance, sometimes the symptoms that are prevalent among women may not be interpreted rightly. Confused, or... assuming health conditions are misunderstood (Leonard, 2021).

The consequences of this can be dire. If the system fails to acknowledge some of the signs, one would not receive appropriate information or assistance. It can delay a diagnosis or lead to incorrect choices about health. This leads to a differential cost of health among subgroups of users over time (Valentine et al., 2025).

Feminist approaches to enhance your design of digital health systems depending on these problems. This

ranges from gathering better data (with respect to diverse user experiences) to designing features that resonate with lived experience. Inclusion from the ground up, rather than making exceptions for some users.

Ultimately, digital health systems need to function but also be equitable and valuable for a range of users. A second enables you to see the gaps and improve your design; viewing them from feminist lenses helps.

7.2 Bias in Algorithms and AI Systems

Algorithms and AI systems are nowadays often hypothesized as a neutral environment of data but in fact, they require data to build on and that data can already have an inherent bias. This is how bias can be creeping from beginning right now. If a dataset used for training an algorithm is limited or lacks diversity, then the resulting algorithm will likely reflect those biases (Hameed et al., 2024). This suggests that correct technical workings of the system may not guarantee that it will function equitably to all users.

This results in the phenomenon termed algorithmic discrimination. If systems are trained on data that is biased, they can treat different groups of people unequally (Ferrer et al., 2020). This may sometimes not be apparent, though it indeed shapes the decision-making mechanism. In hiring systems, algorithms might prefer some candidates from others because of past data that already reflects a bias. Finally, in the field of healthcare, AI prediction systems will not be generalizable across genders if training data did not contain both men and women (Ip, 2025) (Hasanzadeh et al., 2025).

The bias is also present in commonplace AI systems. Popular voice assistants such as Alexa, Siri and Google Assistance often ship with a default female tone. (1) The release deadline is close (October 2023). Following assumptions are reflected as still upon. This can create the impression that support roles are associated with women, something which is already a widespread prejudice. It might not always be an intentional act, but it still shows how bias can attempt to find a way into design decisions (Mahmood & Huang, 2023).

These complexities lead to a demand for ethical design of AI. In particular, it means being more vigilant in how data is collected, how algorithms are trained and how systems are tested. This also means ensuring that the system is fairly functioning across different subpopulations of users and not just against the majority.

AI systems after all are not really neutral at the end of the day. They are a function of data and the assumptions undergirding those estimates. This is why it becomes imperative to design robust systems that are as fair and inclusive as possible.

7.3 Gender-Inclusive Health Interventions

Gender-sensitive Health-care Interventions: Gender-sensitive health-care interventions emphasize actually designing systems that work for more diverse users, especially those that have previously been neglected. Unless healthcare systems are designed around the lived experience of women, gaps remain in diagnosis and treatment. This is leading to greater emphasis on building inclusive and needs-based systems (Long et al., 2023).

An instance of this is the Oky app, which aims to promote menstrual health education. However, it would be a different story because of the “supporting girls by girls” concept instead. Rather than sticking to the very limited design from the experts, this includes young girls in order to directly include their experiences and issues. It makes the app more relatable and easy to use, especially for the target users of the app.

This method is an example of the success of participatory design; By having users take part in the design process, the final outcome itself is more relevant. With Oky, the app has components and information that truly answer what users need and not just elements designers think they might. This makes it a lot more

available and practical use in real scenarios.

This is significant because women's health has largely existed at the margins. Women's pain is mostly dismissed and it can take years before making a diagnosis in some cases (Zhang et al., 2021). A few diseases require a long time to be accurately diagnosed and indeed, often the treatment is initiated if the cause is still not clear. Meanwhile, other fields in research have attracted more attention compared to warrants less priority than women's health (Teke et al., 2025).

Hence, the design needs to be gender inclusive. This allows for more accurate, better systems that serve users who were not right in the first place. This helps in bringing women's health from a secondary to primary status hence trying to treat it from the very beginning instead of later down the line.

It could be observed that with meaningful user input and engagement in deciding what would make the design more useful for users, like Oky app intervention. It is not merely about sharing information, but ensuring it truly circumvents for those to whom it is intended.

7.4 Intersectionality in Health Technology

This signifies that not all users are the same and their needs may shift depending on a multitude of factors and hence intersectionality in health technology. Such as gender, culture, income levels, locations and access to resources. Earlier systems did not properly take into consideration a lot of these disparities and usually treated users as a monolith. As a result, there were some who were unable to leverage these technologies in similar fashion (Wilson et al., 2024).

A key thing to keep in mind here is the consideration of varied user needs in various regions across the globe. That's not to say those situated in different areas aren't also faced with their own predicaments. Some people did not have access to a stable internet, while some others had very limited access to healthcare facilities. This is why one system can be a perfect fit in one place and not anywhere else.

Then cultural and socio-economic factors come in which are also really important. While other communities might have restrictions on talking about some health subjects, especially those unique to a woman [woman's Discussion Forum]. (Barriers in the safe communication of the experience and management of menopausal symptoms: A systematic literature review 2025) In other cases, some users may lack financial access to form a certain technology (Mobilizing Catalytic Finance (Part I) — Catalytic Capital, 2024). These factors influence how individuals engage with health systems and whether they can benefit from them (Ghasemi et al., 2021).

Because of this, inclusive health solutions are critical. Instead of creating a one-size-fits-all MDA, few things should be taken into account specific context and user needs. Including things like simple language, offline capability or designs that honor the cultural context. Now these may not appear to be significant at first, but they can really open up these systems.

This relates to global health equity. What matters is not just having health technologies; it is whether people can use them correctly. In some cases systems are in place, but they are not universal. This is why it becomes important to take different users and their needs into account in order for the system to appeal to a wider audience.

Chapter 8: Gender and Trust in Emerging Technologies

8.1 Feminist Perspectives in Autonomous Vehicles

Apex PredatorSelf-driving cars, a.k.a. autonomous vehicles (AVs), are routinely pitched as being the next great refined transportation mat to bestow everybody with access to on-demand experience. But not everyone experiences mobility in the same way, and this shapes attitudes toward autonomous vehicles as

well. Across many use cases, safety, trust and comfort may vary for a woman and for a man while using these systems.

One important issue is trust. Studies and surveys, in many cases, indicate that women are more cautious of using autonomous vehicles than men (Gelles-Watnick, 2022). This does not mean women don't like technology, rather it raises bigger concerns around safety and reliability. As these vehicles rely entirely on automated systems to operate, users need to have confidence the system will make the right decisions at any point in time.

This is also a matter of safety and comfort. Women most frequently experience public and private transport differently because of harassment, fear for personal safety, or travelling alone at night. That is why mobility comfort does not only depend on how vehicle seats are, but more about the feeling to be safe during crossing times. Leaving these concerns aside some users would feel less comfortable using autonomous systems.

This is also related to what others are experiencing with less mobility [ex: if they identify differently e.g. females]. With varied daily routines, responsibilities and social conditions varying between groups of population, transport is used differently amongst them. Women: the household economy— for example, women might carry out more frequent short-distance trips of caregiving, store errands or family tasks (Well-being implications of mobility of care: Gender differences among U.S. adults, 2024). As such, designers could not adequately represent real mobility behaviours by creating an autonomous vehicle that reflects merely a singular standard type of user.

These differences also lead to well-documented design implications. Autonomous vehicles can not just be about what the car does; they have to think about how different users experience it. It would even include aspects that relate to security, support in case of an emergency, accessibility and the comfort of a user. Thinking about these points from the start can facilitate making these systems more accessible and ultimately more valuable to a larger number of users.

To wrap up, feminist approaches for autonomous cars argue that not everybody enjoys the same mobility. Having these differences in mind can assist a designer to make system improvements, having a safer more pleasant and practical application for varied end users.

8.2 Gendered Perception of Risk and Technology

Individuals do not see the technology in same way, so their risk perception can also vary. And more often than not, it is a question of gender, personal experience, context in society and feeling safe while working with new technology that convinces how comfortable people are — or not — with the way the new technology is being introduced for use. As a result, some users embrace technology quickly and others will be more apprehensive.

Now the first thing that comes into play is risk perception. Research often indicates that women tend to be more cautious about safety, privacy and reliability when they use new systems. (Cutter et al., 1992, pp. 5-22) This does not imply that women are less interested in technology or technologies, but they may reflect more on a possible risk before trusting a system and its output completely. The social norm, however, with men is to reckon that they can afford, or are socially expected, to take more risks or experiment with technology more freely (Venkatesh et al., 2000, pp. 33—60). These differences are not only personal, but also social in nature; shaped by expectation and experience (Cutter et al. 1992-5/22).

This has direct implications on the adoption of new technologies. Even if the technology is advanced, people will shun some systems that do not feel either safe or comfortable. For example by, concerns about data privacy, harassment online or safe usage of the platform/device. Therefore, adoption is as much about

how innovative technology you are taking over as the willingness of users to trust and use the same technology again.

Psychological and social factors are also those that have an important impact. Responses to technology, on the other hand, may differ from user to user and can be affected by personal experience, confidence, cultural expectations and proximity to social stereotypes (Wynn & Correll, 2017). In previous research the user may feel excluded consumers if design of marketing does not mimic that of the additional users (Cutter et al., 1992, pp. 5-22) but influence one's confidence & interaction with the system as a whole.

Which all ties in closely with user experience design. Designers should realize that not all users react to technology in the same way. Safety, transparency, comfort and accessibility features help users be more confident while using systems. This is why good user experience design isn't only about making technology do something but about persuading different kinds of users that it feels functional and comfortable.

Most importantly, gendered perceptions of risk illustrate that concluding statements about technology fail to understand something crucial — experience is not uniformly shared. These variations can serve as a foray into crafting more inclusive and supportive systems that individuals find it easier to trust.

8.3 Harassment Reporting and Digital Safety Tools

Therefore, in the last few years harassment reporting and digital safety tools have become a common part of many online spaces & Digital systems. Up until now, Systems are designed for functionality and communication purposes more but it has been realised over time that equal attention should be paid to user safety too. As a result, extra platforms incorporate reporting methods, blocks and protection mechanisms for users or groups who need to address harassment or other risk situations.

This includes gender sensitive reporting mechanisms. Online harassment is felt in different ways by different users, as women and marginalized groups are often more vulnerable to particular types of violence in digital settings (Watson, 2023, pp. 51–69). For this reason reporting systems should not be overly generic in design. They should take various experiences into account and allow users to report problems in a manner that feels comfortable, without the risk of not being paid attention to or blamed.

Here, too, anonymity and trust play a decisive role. This combination means that many users think twice about reporting harassment, because their identity may be compromised and they believe reporting will most likely achieve nothing (Fissel, 2023). For this reason, systems that offer anonymous reporting opportunities, explicit privacy settings and transparent actions can improve users' sense of security. The role of trust, of course is an important one as it acts as a strong reinforcing factor that can draw more users to taking action with safety tools because they feel catered for (Bright et al., 2026).

Another vital aspect is designing an inclusive survey. Commonly, platforms located customer impact by way of surveys or feedback systems in which customers simply tell them their stories, however when the survey itself is too limited or based totally on assumptions, it runs the risk of lacking out on locating genuine issues. Writing broad-based allows a user to unlock and develop the true trauma/Country needs with emotional responses broader than mere name-calling, which can better educate safety narratives of all platforms directly.

This highlights the importance of design in digital safety. Safety tools are now not merely technical functions slapped on at some stage in the later stages, they form part of how customers trip a platform. Reporting systems are designed in such a way, users only feel protected/will be listened to/not ignored! Therefore, rather than being taken into consideration as an afterthought, safety has to start with the design process itself.

In the end, harassment reporting and digital safety tools are all about doing your best to ensure that users feel safe and at home from the outset, but also mediating issues when they arise.

8.4 Designing for Psychological Safety

Designing with psychological safety is creating systems where people feel comfortable, respected and safe in using them. The emotional security aspect is also not about physical safety or technical protection, but rather about how a user feels when using the product/platform (Moffett et al., 2024). Oftentimes users will walk away from systems they perceive to be judgemental, stressful, confusing or lack support.

It is something that becomes significant in connection with psychological safety because this too connects to user trust (Edmondson & BRANSBY, 2023, pp. 55-78). If users believe that a privacy-preserving system respects their needs and concerns and is properly supportive, they are likely to trust it over time—which makes it more likely to continue to be used (Then Peters 2022, pp.2965-2977). Conversely if a platform feels insecure or emotionally uncomfortable then from a technical perspective approaches that work but do not display the tangible because experience may cause users to hesitate engaging with it (Saariluoma and Jokinen, 2014; pp.303-320).

This is also where the emotional side of design comes in a big way. Design can influence end-users — in the easiest fashion such as a language, colours, notifications, feedback system and even tone of communication. That said, a system which seems passive or conservative will completely fail to energize the next action), Building (A digital interface is designed with users in mind — they need to feel and act as; design will directly influence how you engage with it., 2023). When designing cross-systems; if it is too aggressive, confusing, or overwhelming you create stress for users. Conversely, uncomplicated and supportive interactions can lead users to feel safer, and more at ease when using a program (Estrada & Suk 2025, 1-13).

This notion is also closely connected with feminist ethics of care. Feminist perspectives on design emphasize that design is not just about functionality, but also relationships, empathy and the user's responsibility (Croon, 2022). This makes psychological safety a factor in inclusive design. Instead of merely asking if it works, this approach asks whether users feel supported and valued while using the system.

Designing for psychological safety ultimately means designing aware of the fact that users are not only technically engaging with your tech, but emotionally as well. Taking these emotional experiences into account will create a more supportive design system that is built with more trust and inclusiveness in mind for different users.

Chapter 9: Challenges in Implementing Feminist Design

9.1 Institutional and Industry Barriers

Real-world systems: Feminist design is hard. Over the course of time, awareness of inclusivity and gender bias increased; however, many organizations stick to legacy design practices and standards (Lillegård et al., n.d.). Due to this, changes under the umbrella of feminist and inclusive design take more time to spread, most notably among big industries/institutions (Mikus & Rieger, 2021).

One of the most difficult challenges is overcoming resistance to change within organizations. Many companies have well-established ways of working, and might view new approaches as overhead or a time sink (Dunne, 2018). Sometimes organizations might emphasize speed, time frames, or current functioning business models over asking if the systems they are using are indeed inclusive for different users (Forrester, 2023).

Another important barrier is the lack of awareness regarding gender bias. Some designers and decision-makers may not fully recognize how bias can become embedded in products, systems, or research methods (Herriott, 2013, pp. 138–158). As a result, certain issues may be overlooked or treated as insignificant, even when they have real consequences for users in everyday situations (Towards Care-Full Co-Design with Older Adults: A Feminist Posthuman Praxis, 2024). When these biases go unnoticed, they can continue to influence design decisions and shape user experiences in ways that exclude or disadvantage certain groups. This makes it difficult to create truly inclusive systems and representative of diverse users. Another major challenge is the lack of diversity in design teams (Mikus & Rieger, 2021, pp). Teams composed of people with similar history or backgrounds to one-another can end up creating systems that, unintentionally, are designed from a single point-of-view. This results in products that work for some users, and not others (Škec et al., 2024, pp. 1095-1104). Diverse teams facilitate a more varied set of points and experiences in the design process.

Profit-driven priorities also affect inclusivity. Companies in many industries focus on getting big, getting it done, getting the most money you can. As a consequence, some inclusive design characteristics may be considered secondary or ancillary if it is noted that accommodating its implementation is too costly or time consuming (Mikus & Rieger, 2021, pp. 13-31). And sometimes companies still will only make a move if there is public backlash and strong consumer demand (Rhetorical Reason-Giving through Image Restorative Strategies in Corporate Responses to Diversity, Equity, and Inclusion Pushback: A Content Analysis of Publicly Articulated Corporate Position Statements 2026).

Ultimately, barriers such as these indicate that feminist design is a challenge not only of the technical sort but also of an institutional and cultural one. Design methods may get a little better, but building systems that are more inclusive also requires changes in levels of awareness and action, workplace culture, and political decision-making processes.

9.2 Practical Challenges in Co-Design

There are co-design and participatory design approaches that attempt to involve users earlier in the process, although this is not always easy to manage in practice. While these approaches aid in creating more equitable user-centered systems, they also have a number of practical overheads that need to be managed during implementation.

Time and resource constraint is a very big developer pain point. Co-design typically necessitates ongoing strategy meetings, user testing and iterations of design. This may require more time than traditional methods where the vast majority of decisions are made by designers alone (Becker-Haimes et al., 2022). Due to limited time and budget, participatory methods are seen as cumbersome processes in many organizations (Jagtap, 2020).

The second one is dealing with different stakeholders. In co-design, multiple user groups, designers, researchers and organizations may be involved together. As a result there can be lots of varying opinions and expectations. However, users might want opposing things from an identical system (Thorburn et al., 2024), making decision-making more difficult.

User needs conflicts are also frequent. What works for one group will not always work equally well for another. Some are only simple games while others with more feature-rich customizations. As a result designers can find it difficult to accommodate competing needs without leaving some users out (Bekker & Long, 1998, pp. 25–35).

The process of participation itself can definitely become complicated. It calls for organizing workshops, interviews, discussions and feedback sessions. Despite that, those situations may not be as welcoming and

open for all users, affecting participation and representation (Bratteteig et al., 2012).

In short, co-design contributes to inclusive systems that focus on the user, but it is not easy per se. Making it happen takes time, effort, communication and balancing various points of view.

9.3 Cultural and Social Constraints

Cultural and social contexts are also strong influencing factors for how activist approaches in feminist and indeed design are welcomed in given territories. The views regarding gender role, technology, health care and instruments for public participation may differ among societies (Witte et al., 2021, pp. 102-113). This is why a design approach that works here may not work as well elsewhere.

An area of concern is gender norms that differ across cultures. In more traditional societies, gender roles exist where men are expected to act one way and women another, and these expectations can change how people interact with the systems in their environment (Smith & Doe, 2022). Women, for instance, may have less access to technology, schooling or health care than men in some communities (Denend et al 2020). This means that during the design process, their needs perhaps cannot always be seen.

Resistance may also emerge in countries that are more conservative. Social topics surrounding gender inclusive language, reproductive rights, LGBTQ+ advocacy or feminist arguments are sometimes not discussed openly (or at all) (Conroy et al. 2020: pp. 48-64). The inclusive features or any awareness campaign may be criticized in some cases that how valuable they are and this kind of criticism is because this is against the social or culture (Kim & Bae, 2016). Which makes it harder to implement.

There are also large socio-economic factors at play. Other users lack access to necessary technology and reliable internet as well as higher education, health care services and systems (Yu & Meng2010). As a result, systems oriented primarily toward urban or wealthier users might not function well for rural residents and low-income populations (Witte et al., 2021). The same applies to accessibility, one of the main variables in these cases.

Together, all of this makes global design implementation difficult. Companies and designers attempt to build systems that can be used broadly across different countries and cultures, but users are not created equal. A design that feels inclusive here may seem alien and unusable in another. Thus, designers must take local cultures into consideration when designing, rather than assuming one design will work as well in every context.

In fact, cultural and other social limitations indicate that, if anything, inclusive design has less to do with technology than it does about what people know (and need) in terms of people, societies available data and lived experience.

9.4 Measuring Impact of Feminist Design

Evaluating the effects of feminist design isn't always a straightforward process. Unlike technical performance, which can be measured in numbers or efficiency tests on some level, inclusivity and user experience are hard numbers to come by. This makes it hard to measure objectively and assess how successful a feminist or inclusive design approach is in actuality.

Measuring Progress One difficulty is making inclusivity quantitative. The same system can be experienced differently by different users depending on their identity, gender, cultural background or personal experience. The system might feel inclusive to one group but at the same time may cause challenges for another. Thus, inclusivity can never be boiled down to simple percentages or score even if you were to combine all the components.

The absence of standard metrics is another hurdle. In many cases, organizations already know how to measure speed, usability or technical performance — but comparatively few methods are generally

accepted as ways of measuring fairness and factors that influence emotional comfort such as trustedness and representation, or accessibility (Perrig et al., 2024). That complicates evaluation, because designers do not always know which factors should get priority.

Then you have the problem of long-term/short-term results. A few changes to performing an inclusive design process may take a while before showing concrete results. For instance, a system might take months or even years to gradually increase their users' trust, confidence or be more accessible but it would probably take more than half of the research window to see these effects (Perrig et al., 2024). This means that the short-term impact may miss other potential larger effects of question design for inclusion purposes. This calls into question the need for new evaluation frameworks. Future design evaluation may no longer be limited to efficiency or technical success, but could include considerations for inclusivity, emotional permeation, accessibility and representation. This enables designers to gain a better understanding of how different groups of users might be affected by systems.

Ultimately, feminist evaluation of design should not only be to see if such a system works, but for whom it works and what non-utopian interactions (or silos) people have with various users over time.

Chapter 10: Future Directions and Conclusion

10.1 Towards Inclusive Human-Centred Design

While Human-Centred Design was designed around users, the question became who is represented as a user over time (Seaborn et al; 2023). For this reason, there is increasing engagement in the draft community toward ensuring that HCD becomes more inclusive through the integration of feminist principles and broader perspectives into design practices (Lamirande, 2022, pp. 497-517).

This to some degree seems like a step towards this is embedding feminist principles in HCD. That means thinking more about inclusion, representation, accessibility, and the fact that users may experience things differently. Designers should see users as implementing and interacting with systems in different ways, based on factors like gender, culture, ability or social background rather than assuming one solution will work for all.

Another crucial point is to diversify your design teams. Diverse teams that include people from different backgrounds and experiences tend to identify issues others would miss. By understanding user needs from different angles, designers can scope projects more effectively and prevent the problem of designing systems where a limited set of users thrive.

A second key area is creating an inclusive design framework. End-to-end design is typically focused on usability intents & efficiency but the framework for the future of design may need to widen pointers around fairness, emotional well being, accessibility and representation as perspective elements of an end-to-end inclusive design paradigm. This can be useful in building more supportive systems for various types of users (Vrančić et al., 2024, pp. 1502-1550).

But the need for systemic change is equally important. Inclusive design is about more than simply adding some extras or making minor tweaks. Organizations, industries, and institutions may need to re-examine their own decision-making, research practices, and whose experiences matter in the design process (Gabor et al., 2021, pp. 1-6).

Inclusivity with Human-Centred Design basically means creating systems that have the capacity of working with larger audiences rather than just a smaller set of users. It is about leveling the playing field in design, getting better representative numbers, and being cognizant of different human experiences.

10.2 Policy and Industry Implications

The inclusive and feminist design conversation is not only for designers or researchers. How systems and technologies are developed is also determined by policies, industries, and public institutions. This is why large systemic changes become essential if inclusive design practices are to ever be embedded across the board.

Regulations related to inclusive design are one of the critical dimensions. Often companies advance an agenda of performance, speed or profit at the expense of inclusion. For this reason, policies and regulations can help motivate organizations to take accessibility, representation and fairness into account as features of design rather than opt-in add-ons.

Gender parity in leadership positions is another pressing issue. Certain limited groups of people hold decision-making power in technology and design spaces which will dictate what kind of perspectives are included during the development process. When leadership teams become more diverse, so do the experiences and perspectives that shape discussion and final decisions (Drage et al., 2024).

There is also demand for ethics in technology. The field of AI systems, healthcare technologies, and digital platforms are expanding rapidly yet concerns regarding privacy, bias, safety, discrimination etc. This means that there may be a need for more stringent industrial ethics to ensure the responsible design and equitable operation of systems that can function properly with particular types of users (Hasanzadeh et al., 2025).

This task is also an important part of the public sector. This is where governments/ public institutions can step in and provide funding, public policy, education or to create awareness around the need for inclusive design. Another benefit can include ensuring that public technologies and services are more accessible to a wider range of users, rather than just a selected group.

Ultimately, designing systems that are more inclusive is not solely on designers. Technologies are shaped, in part, by the industries that build them and the political and public institutions that provide a timely response to equitable access.

10.3 Research Gaps and Future Scope

Despite a seemingly growing interest in feminist design and inclusive Human- Centered Design over the years, many research gaps remain to be addressed. It has been found that even existing studies are geared towards certain user groups, and that different perspectives are absent from research and design practices. It has several important gaps however — one of which is the lack of intersectional studies. Users are not identified by single identity, for example users are not identified with gender only. Culture, class, disability, race and location also affects people's experience of systems and technologies. This suggests that future studies should investigate the interrelations between these different influences, rather than investigating them in isolation.

The second is AI and emerging technologies. Artificial intelligence, machine learning, facial recognition and automated systems are gradually becoming commonplace in everyday life. However, if these systems are trained using limited or biased information, they may embody the bias within them. As a result, there is a need for further research to define the nature of bias in these technologies and ways such biases can be reduced during design/development (Chen et al., 2024).

Greater emphasis is also to be placed on Global South perspectives. Technology and design research is frequently grounded in Western users, environments, and experiences at the expense of those from Asia, Africa, Latin America and beyond. Due to this, systems designed from these angles may not perform well in other cultures or socio-economic conditions.

This is where interdisciplinary research comes into play as well. Inclusive design is also related to and informed by other areas including psychology, sociology, healthcare, ethics, education and cultural studies as well. Screening ideas from diverse disciplines can help researchers gain a more holistic understanding of user experiences and arrive at outcomes that are more balanced.

This suggests that although more feminist and inclusive design research at some time begins from a very narrow view, future work needs to go beyond this limited view of who (and what) are the users, experiences and technologies involved. This can assist in developing systems that are more equitable, appropriate, and applicable across various scenarios in the real world.

10.4 Final Conclusion

This study examined how feminist and intersectional perspectives challenge traditional assumptions within Human-Centred Design (HCD), particularly the idea of designing for a single “default” user. While HCD aims to focus on users and their needs, many systems continue to be built on limited assumptions related to gender, accessibility, and social norms. As a result, the experiences of many user groups are often overlooked in areas such as healthcare, technology, transportation, and digital platforms (Velsen et al., 2022). The findings of this study suggest that a more inclusive approach to design is necessary in order to better reflect the diversity of real-world users and their experiences.

The main finding of this research is that design, to a greater or lesser extent, is never neutral. However, the decisions made about research and development or even implementation can mirror social structures and biases that are already in place. Subtle differences in how different users experience a system can be observed across other examples including healthcare apps, AI systems, autonomous vehicles, safety tools and digital platforms (A Critique of Human-Centred AI: A Plea for a Feminist AI Framework (FAIF), 2025).

The research also clearly demonstrates the necessity of inclusive and participatory approaches in its design. Methodologies such as co-design (Steen et al., 2011), feminist ethic of care (Ede, 1999), and gender-informed research methodologies help designers to learn about how real users experience products rather than designing based only on assumptions. These methods push for designers to consider voices that were previously neglected or marginalized (Benz et al., 2024).

Also, to think not in a one-size-fits-all user category but individual users each will have their own goals, insights and background. So many things affect how users interact with systems, such as gender, culture, disability and socio-economic conditions. This is why one design solution does not work for all (Intersecting perspectives: A framework for participatory street review practice towards urban inclusivity, 2025).

At the same time, the research also showed that implementing inclusive design comes with challenges, including institutional barriers, cultural differences, lack of diversity in teams, and difficulties in measuring inclusivity (Intersecting perspectives: A participatory street review framework for urban inclusivity, 2025). Yet, as much as these barriers build challenges to intentionality, it has gained prominence due to their integral role in modern technologies impacting how they shape daily life.

Ultimately, inclusive design is not something that can remain fixed or fully completed. Human experiences, technologies, and societies continue to change over time, and design practices also need to evolve along with them. This makes continuous reflection, adaptation, and inclusivity an important part of future design thinking.

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