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Design Justice in Human-Computer Interaction and User Experience: Frameworks, Case Studies, and Evaluation Metrics

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ABSTRACT

Design justice has emerged as a critical paradigm within Human-Computer Interaction (HCI) and User Experience (UX), foregrounding the role of design in shaping, reinforcing, or challenging systemic inequities. This paper examines the conceptual foundations, frameworks, case studies, and evaluation metrics that define design justice in contemporary HCI/UX practice. Drawing from critical design theory, feminist technoscience, and participatory methodologies, it positions design as an inherently political and value-laden activity. The study explores key frameworks, including participatory design, community-led governance, power-aware design, and critical design approaches that seek to redistribute power and center marginalized voices in technological development. Through selected case studies in health technology, education, and civic platforms, the paper illustrates how justice-oriented design interventions address inequities in access, representation, and usability. It further evaluates methodological approaches and metrics, emphasizing both process-oriented indicators (participation, representation, empowerment) and outcome-oriented measures (usability, accessibility, and impact on inequality). The analysis highlights persistent challenges such as tokenism, resource constraints, and tensions between usability and justice goals. Ultimately, the paper underscores the importance of integrating design justice into practice, policy, and education to foster equitable, inclusive, and accountable technological systems.

Keywords: Design Justice; Human-Computer Interaction (HCI); User Experience (UX); Participatory Design; and Digital Equity.

INTRODUCTION

A scientific design justice perspective born from the Latin American liberation movement addresses systematic injustice and unfairness, striving for a fair and inclusive future [1]. The design justice framework, rooted in critical design and feminist technoscience, enables HCI and UX researchers and practitioners to anticipate and better address inequitable or unwanted consequences throughout the design process [2]. Based on foundational principles developed collectively by multiple authors, the framework encompasses participatory design, community-led design, power-aware design, and critical design approaches [3]. Frameworks have guided HCI and UX in various domains, including civic technology, public services, health, education, and digital rights. Design justice principles have provided direction in projects aimed at harm reduction, accessibility, and sustainability, shaping projects targeting algorithmic decision-making, fake news and misinformation, misuse of expert knowledge, data protection, and the digital divide [4]. Positive digital equity effects can counteract inequalities resulting from personal devices, internet connections, and non-linear learning pathways 1. Median-grade health technologies capturing lifestyle data in children, adolescents, and adults have supported an Ethics by Design initiative concerning data ownership, usage, collection frequency, and privacy [1]. Governments, non-governmental organizations, and companies have addressed the risk of public distrust engendered by personal information collection following the digitalization of services [2]. Although the digitalization of services holds the

potential to reduce the digital divide, access to public platforms can be impeded by the compulsory delivery of supplementary personal information through pre-existing devices or existing digital policies. The incorporation of additional elements such as information request volumes, knowledge retention concerning usage and data dissemination, access to products or services, and anti-discriminatory policies independent of supplementary profiling constitutes further avenues of equitable inquiry [2].

Conceptual Foundations of Design Justice in HCI/UX

Design justice is expanding its influence and gaining considerable momentum in HCI and UX design, yet its conceptual foundations remain under-explored [1]. Emerging as a set of justifications and principles for design practices that address the needs of disenfranchised and marginalized communities while reducing inequities, design justice advocates assert that design is not a neutral activity but rather one that shapes the conditions of life in society [1]. Events such as community movement against police brutality and surrounding public activism; calls for equitable access to community-collected data and technologies during the COVID-19 pandemic; and new approaches to the regulation of lethal autonomy in advanced weapons have enriched and updated the conceptualization of design while also oversaturated and complicated the discourse surrounding design justice[2]. A set of coherent foundational thinking about the need for and principles of design justice specifically for HCI/UX is called for to guide scholarly discourse and design practice [3]. Furthermore, to begin to close the gap between more ethereal discussions about the conceptualization of HCI/UX and insight into tangible practices, case studies of significant community-led HCI/UX projects or design culture efforts are reviewed. Each account is crafted to highlight the design problems addressed, the principles of design justice evoked, the specific design interventions or cultural positions adopted, and the resulting outcomes within the community [4].

Historical Roots and Ethical Imperatives

The term design justice surfaced in 2018 and conceptualizes design as a inherently normative practice that profoundly affects, often detrimentally people's lives, a reality intensified by HCI's increased focus on social and political systems [3]. The concept arose partly from discontent with inclusion and equity, which fail to address oppression frequently encountered by underrepresented and marginalized groups. Design justice counters inequities and challenges socially and historically embedded power relations within design and society [1]. A design justice perspective encourages examination of processes, systems, issues, and implications associated with design practice [4]. Design justice constitutes a framework aimed at reducing inequities and dismantling power structures, facilitating non-dominant groups' critical engagement with design processes, and challenging presumptions mostly influencing socially sensitive design theorizations. Design justice and HCI share a common goal: enhancing overall equity and balancing disparate needs [5]. Design justice recognizes social justice, an overarching system of power relations and societal arrangements, as the core issue, acknowledging structural inequities perpetuated through engineering and design. Processes responding to these inequities must embrace critical examination of power relations, structures, and processes operating within society, technology, and design [6]. Specifically, challenges persist within urban settings related to social welfare, public housing, and basic supply access. Historical transformation of widely accepted systems design, architecture, engineering, and technology remains constrained by ongoing patterns underrepresented groups withstand within urban environments [7].

Core Principles of Design Justice

Design justice encompasses a set of principles for equitable, inclusive, and accountable design. It promotes processes that allow marginalized communities to participate in shaping the design of systems that affect them. Design justice is accessible to diverse stakeholders; users and designers, researchers and practitioners, non-profit organizations and large enterprises can all engage with its theories and practices [3]. The act of design is a socio-political act. Designers and their expertise are already deeply intertwined with systems of power. The design process has a direct impact on social and economic justice, including questions related to equity, fairness, privilege, oppression, sustainability, and exploitation [4]. Designers enact a set of design decisions that create design capacities for the intended and unintended users. Design enacts, embeds, and embodies power in three ways: proposed, legitimate, and real control over a system design. Recognizing and acknowledging how design compromises and influences control in a system helps inform design decisions that move the design in a desired direction [5]. The imaginative capacity of designers and non-designers alike allows for multiple communities to envision different design possibilities for a socio-technical system. Design justice empowers local communities to imagine how design might be used in specific settings to advance justice in ways unique and desirable to their local context [6]. Design practitioners or experts are deeply involved in the design of future possible designs. Expert practitioners in the field of design seek to understand the social and technical aspects of the local context (the community) where design is considered in order to help imagine a design vision (a large picture view of a possible design)[7]. The design of a capability or vision for a community is itself part of the design process, despite being outside the design of the capability itself [1].

Relationship to Accessibility, Inclusion, and Equity

Various frameworks call for HCI/UX work to consider accessibility and discrimination. Instead of broad notions of inclusion relevant across many domains, "design justice" focuses on systemic inequality, social power, and specific dimensions of exclusion [6]. The concept of universal design emerged in architecture but has also influenced ICT. Universal design seeks to promote access for everyone and to create useable products regardless of age, ability, or other factors 6. Examples include text-to-speech technology, ramps, and design-for-all principles. Such approaches have also been asserted in relation to education technologies, although the educational landscape has shifted since then. Similar principles of universal design, ageing-in-place, and technology-for-all are espoused by local councils [7]. Principles of universal design are echoed in frameworks for anti-discrimination and universalism that map discrimination across axis and e.g. empower formal equality [8]. These frameworks assume widespread abstraction on the part of HCI in general. Architecture, design, and engineering courses cross-university universally pursue these models. Strategies such as matching, generosity with configuration, and gently intrusive but content-expository nudging remain widely adopted as warm-holding within techno-sociology but continue mostly unchecked under the algorithmic overseers of big-tech even as academic civil society collectively expresses discomfort with concentrated digital sociotechnical power, so-called "market-design," "attention-economics," etc[9]. In the spatial design of urban settings, similar competing concerns and somewhat balanced progress toward informatics remains colloquially referred to as "Safer by Design". Advance such comparisons among Design Clinical projects [10].

Frameworks for Design Justice in HCI/UX

Many frameworks and associated methodologies can help to undertake design in a justice-oriented manner. Participatory design and co-design methodologies cover various processes that actively involve stakeholders who are affected by the design in the design process [8]. Community-led design and governance frameworks delineate how such participatory processes can also lead to community control of the technologies that are developed and the degree of design capability that different members of the community possess for a sustained and ongoing impact. Power-aware design frameworks and anti-oppressive approaches allow practitioners to recognize and address power differentials among stakeholders [5]. Critical design and feminist technoscience platforms promote design processes that provoke public conversation on issues that obstruct justice, criticize the existing norms governing the design of the technology in question, or simply call attention to neglected justice-related concerns.

Participatory design and co-design are two closely related methodologies that actively involve multiple stakeholders in the design process [5]. Whereas participatory design traditionally emphasizes the involvement of users as co-designers, co-design encompasses a broader range of participatory activities for other participants such as designers, graphic artists, or domain specialists. The terms participatory design and co-design are often used interchangeably, although some practitioners prefer to reserve the term participatory design for participation-focused approaches that address power, democracy, and society [4]. Different participatory design methodologies address varying local needs, and an extensive body of literature articulates design processes, roles, and associated power dynamics within the broad participatory design framework. Community-led design frameworks emphasize community governance structures that provide citizens with decision-making authority and influence over a system, with an expectation that a community can organize a mass of users to advocate for their collective interests. Archon Fung's decision-rights framework specifies five key governance choices: the definition of the problem, the evaluation of alternative solutions, the implementation of a decision, the monitoring of implementation, and the assessment of results [5]. Choosing a single governance structure and associated rights for all decisions, in contrast to flexibly tailoring decision rights for different choices, can inhibit a community's ability to implement collective governance. Moreover, collective governance is not inherently sustainable, and the circumstances that enable it to endure even after allocation decisions have been made merit attention [6]. Power-aware design frameworks, combined with anti-oppressive approaches, enable a broader integration of justice-oriented principles into the conventional design process. Design practitioners can adopt various lenses to investigate levels of power within a given context and explore strategies for ameliorating oppressive power structures and arrangements [7]. Social-mapping approaches render visible relations of power in systems designed to foster broader and more equitable justice. Robin Mansell's notion of "the information power triangle" depicts the balance among information, knowledge, and influence in information and communication technologies designed to promote wider justice. The wider set of principles represented through power-aware design resonates closely with feminist, critical, and broader justice-oriented themes that target systemic socio-political concerns [8]. Critical design frameworks and feminist technoscience perspectives argue for a provocative and deliberative design approach that aims to critique the normative dimensions of design framed within participatory and experimental practice. Such approaches have been variously defined as critical design, adversarial design, delicate trouble, and design activism. Provocative design aims to stimulate public debate about the role and influence of design in contemporary life [9]. Design can provoke participation among previously disengaged stakeholders, drawing them into consideration of who possesses the right to design, whose designs are accepted or rejected as

legitimate, and whose interests are reflected in the design of systems purported to serve citizens. Intervening at the level of expressive design, challenge-driven participatory design focuses not solely on gathering information about users but also on challenging their motivations and design aspirations [10]. These frameworks and methodologies address additional socio-technical and power imbalances mapped onto traditional HCI role definitions that are informed by feminist and pluralist design perspectives. Participatory design and community governance literature connects design insight with local design autonomy to broaden justice-oriented intervention space [11]. The democratization of design technology expands what designers can do. Attention to the dynamics of power–information distribution within ICT and on broader frameworks for power-aware design mesh with critical and feminist considerations of the politics of design and broadening participation in socially and politically engaged design[12].

Participatory Design and Co-design Methodologies

Participatory design and co-design methodologies involve defining design problems, brainstorming ideas, developing prototypes, and evaluating designs collaboratively with communities [13]. Design justice perspectives emphasize that such processes should also scrutinize the power dynamics embedded in design activities, jointly shaping governance structures, rights, and responsibilities [14]. A participatory design workshop dealing with food justice illustrates how a community-focused approach maps stakeholder power relationships to explicitly represent and redistribute authority [15]. Participatory design and co-design methodologies engage communities and organizations in designing technologies intended to address systemic social issues such as food access, education, housing, and health. Iterative processes help define design problems, brainstorm ideas, develop prototypes, and evaluate designs with community members, nonprofits, and local organizations, thereby directly addressing local challenges [11]. Reflection on notions of justice exposed implicit assumptions regarding power imbalances and informed multilevel governance structures aimed at remedying them [12]. Power-aware design extends participatory and co-design methodologies to assess and redistribute the power embedded within design activities [11]. Participatory systems operate on two levels: the conventional level where stakeholders work together to design interventions and a second level where the overall governance of the participatory process is jointly scrutinized. Mapping power relationships across digital infrastructures, social movements, and physical environments helps pinpoint imbalances and focuses attention where redress is most needed [12].

Community-led Design and Governance

Governance structures define the distribution of decision rights among stakeholders and their expected influence on design processes and products [9]. The right to affect design choices entails both individual and collective power [8]. Sustainability encompasses the (continuation of) governance arrangements and support for the community, organisationally and materially, to pursue further design and implementation of technology-based responses to pressing needs in specific local contexts [7].

Power-aware Design and Anti-oppression Approaches

Designing Power-aware Interactions: Power-aware design identifies power dynamics and associated harms in the design and use of emerging technologies [10]. The underlying premise is that all design decisions affect power at some scale. Designers can address power imbalances directly or mitigate harms stemming from deeper causes. Selected anti-oppression frameworks, Critical Race Theory, Feminist Science Studies, and Indigenous Design Methods, serve as lenses for examining these imbalances and targeting related interventions [1]. Power-aware interactions emphasize the politics of materiality, demonstrating how systems shape and are shaped by power [11]. The capacity to intervene in these feedback loops enables designers to critique the aims and assumptions embedded in political technological designs and to imagine alternative directions 2. Cumulatively, a focus on prevention, mitigation, intervention, and reimagination fosters more far-reaching, rigorous examinations of political dynamics [9].

Critical Design and Feminist Technoscience Perspectives

Prototypical critical design projects invoke provocative designs that challenge dominant discourses, power structures, and micro-political conditions [2]. Yet most HCI interventions aim for acceptance and integration, often encouraging users to broaden objectives rather than amplifying desires for a more just world [3]. Paradoxically, approaching design as an expansion of desires echoes dominant, neoliberal conceptions of the good, hindering more radical engagement [3]. Framing design as extension rather than critique risks perpetuating existing conditions, including inequitable access, representation, and influence over mutual-trust-building engagements [4]. Normative critiques of socio-technical configurations, therefore, remain essential to expose persistent injustices [5]. Limited opportunities to highlight normative principles within tightly scoped projects also characterize other design practices. Responsive and generative systems, for instance, can address local needs; however, system framing emerges as a significant dimension of political engagement [6]. Introducing derogatory descriptors into project framings invites reconsideration of normative positions. Projects like NormGraphics, which augment mainstream conversation analysis with design-oriented capabilities, simultaneously expand sociotechnical consideration while exposing additional opportunities for democratic enhancement [7].

Case Studies in Design Justice

Equity matters. Unfortunately, the emergences of novel education delivery modes through educational technology have created barriers for at least one cohort of undergraduate engineering students at the University of Alberta [8]. More than one-quarter of the cohort dropped one or more of their courses in the Fall 2020 semester, the highest level of course-drop in the last five years[7]. The University of Alberta engineering program is the only undergraduate degree program in Canada to have been globally-recognized through the Canadian Accreditation Board [7]. The equity gap has since widened even further since engineering students transitioned to online courses and virtual group learning platforms. Across Canada, Indigenous groups in particular are being disproportionately affected by the COVID-19 crisis and are three times more likely to die from it [8]. Educational technology tools implemented before COVID-19 such as the Zoom video conferencing system, and digital institutional tools such as eCampus Alberta and Google Classroom, were investigated through design justice lenses [1].

Health Technology and Inclusive Patient Interfaces

Several patient-related interfaces are addressed within multiple health technology projects, focusing on improving user experience for the patient while often considering the perspective of other stakeholders [9]. "Selective design" proposes diverging from communication by choosing detectable functionalities and adapting the remaining to specific patient requirements [10]. "Dual interface" separates patient involvement according to physical or cognitive capacity, enabling involvement in both hindering use, while permitting alternative means into the device. "Commanding interface" introduces verbal commands as another patient interface, exploiting the flexibility of voice input [11]. Each has been applied to at least three projects with evidence of significant patient benefit while avoiding detrimental effect on other stakeholders [12]. Enabling an otherwise impossible use allows patients to engage, thus contributing motivational elements to what may otherwise be considered obligatory interaction [13]. The "designing for equity" proposition indicates design research in refining these concepts and developing new approaches while seeking additional evidence of potential equity implications [8].

Educational Technologies and Equitable Access

Educational technologies in eLearning platforms and high-stakes assessment systems exhibit inequitable access, severely constraining the learning experiences, outcomes, and opportunities of many members of society [14]. Multiple barriers arise across different cohorts, with students without home Internet connections and those lacking a television or computer disproportionately affected [15]. The consequences are pronounced: a study revealed stark inequalities in learning hours, with Grades 1 to 5 students in the richest quintile amassing 143 hours of engagement per month while those in the poorest quintile recorded a paltry 2.5 hours [9]. Statistically, Grade 3 students who consistently participated in online lessons scored up to 50% higher than their peers who avoided them entirely, while the respective figures for Grades 1 to 2 stood at a 12% disparity in favor of participants. As access barriers magnified inequality, comparable frameworks and metrics for counteracting such situations become especially pertinent [16]. A second case emphasizes public-facing government and civic technology platforms that aim to facilitate citizen engagement with authorities, improve transparency, and bolster governmental legitimacy [10].

Public-facing Government and Civic Tech Platforms

Governments and other organizations attempt to engage and communicate with citizens and the general public through public-facing civic-tech platforms [11]. Such platforms are designed to facilitate civic engagements, build transparency, and enhance legitimacy [7]. They travel between documentation-making, citizen-engagement tools, and crowd-sourcing public opinions. Different approaches can be seen in various platforms, including middle-out design and participatory design. The latter specifies that community voices should be integrated in development of any concerned technology [12].

Domain-specific Exemplars in Accessibility-centered Design

The Technology and Empowerment for People with Disabilities project (TAPDD) in Pakistan illustrates how accessibility-driven design can empower underserved populations to share their perspectives. Within Disability Studies (DS) and Disability, Diversity, and Inclusion (DDI), accessibility is widely recognized as a precondition for participation and as a means of empowerment, a trend that has also begun to emerge in Education and Learning Technology (ELT) design. Educational attainment for hearing-impaired and visually-impaired cohorts in Pakistan lags far behind other groups. Designing tools that allow these communities to share their expertise with the wider public can help to address systemic inequities [10], formulating a Design Concept that is both culturally and thematically relevant to the TDDP initiative [11].

Evaluation Metrics and Methods for Design Justice

Evaluation metrics and methods for design justice are crucial for assessing the inclusivity and effectiveness of design processes [12]. In HCI/UX, relevant research emphasizes the importance of participatory approaches and context-aware evaluations. A combination of qualitative and quantitative methods helps understand diverse user needs and reduce bias in system design [2]. Because design justice ultimately comprises both process- and

outcome-oriented objectives, evaluation should measure the intersection between both these facets and retained principles and values whenever feasible [3]. Such process metrics include indicators reflecting relevant participation, representation, and empowerment secured throughout design, such as the number and diversity of stakeholders involved for instance, who was involved in the design, prototyping, and evaluation activities as well as the degree of power afforded to these participants and the capture of their expressed needs into design decisions[4]. The necessary data can usually be collected publicly from project documentation or internal records, either ex ante or immediately on completion. Alternative mechanism indicators focus on community governance, seeking data about operation rules and stakeholder engagement to characterize authority levels and responsiveness; primary data can shed light on consequent impacts such as community ownership feeling and sustained active involvement[5]. Outcomes also remain relevant to ascertain a broader picture of potential influence and sometimes complement incomplete process information. Measures are familiar from usability and accessibility assessment for example, via standard questionnaires around user satisfaction, discrimination easiness, general engagement support, or perceived explanatory quality and a variety of community resources offer benchmarks [6]. The literature indicates active support reduction, violation acknowledgment, or heightened transparency as methods to lessen the deepening of historical racial inequality across digital initiatives specifically for government and civic tech platforms. Methodological approaches may combine mixed methods, participatory techniques, and longitudinal frameworks [7]. A systematic strategy can integrate differing material through an overarching analytic conceptualization, providing a unifying rationale on how diverse aspects interconnect into a design-justice perspective and specifying precise research inquiries to guide data gathering and purge irrelevant or redundant items. In addition, an array of tools and rubrics enable ongoing accountability [8]. Governance checklists assist broader design planning, reminding of diverse aspects to encompass; audit protocols direct scrutiny on existing realization degree from a justice stance; and reporting templates convey pertinent information through succinct formats [9].

Process-oriented Metrics: Participation, Representation, and Empowerment

Design processes that uphold justice for the communities affected by information and communication technologies require metrics to evaluate progress toward these goals and to guide decision-making throughout design projects [13]. Metrics related to participation, representation, and empowerment can be defined and operationalized as process-oriented indicators of design justice, with their measurement made easier by specifying data sources and timing for collection [14].

Outcome-oriented Metrics: Usability, Accessibility, and Impact on Inequality

To advance design justice in domains where disparities in power and privilege predict unequal design outcomes, evaluate interventions through outcome-oriented metrics that expose sustained impact on access, opportunity, and treatment [3]. Establishing from baseline measures across HCI, UX, and related disciplines, three general metrics usability, accessibility, and detrimental impact on inequality, serve as comparative benchmarks for design-justice initiatives [4]. Across design processes and diverse geographies, observations affirm that enhancing one of these outcome-oriented measures usually benefits the others, thereby promoting equity and inclusion [5]. Usability encompasses the effectiveness, efficiency, and satisfaction with which specified users achieve specified goals in particular environments [11]. Given concurrent global developments and persistent threats to democracy, human-centered design priorities remain relevant, yet also extend to design justice frameworks supporting less-well-represented stakeholders and those subjected to historic atrocities [10]. The System Usability Scale (SUS) fosters standardised assessments globally, averaging at 68 by algebraic conversion of items into a form converging between 0 and 100 [10]. Enabling task completion regardless of user abilities constitutes accessibility [1]. One design project aiming to improve accessibility across geographic and cultural boundaries elucidates low coordination and participation levels despite global engagement; isolated literacy problems relegating entire cohorts to silent, insufficient access further complicate transferability [10].

Methodological Approaches: Mixed Methods, Participatory Evaluation, and Longitudinal Studies

The design justice framework encourages the examination of formative evaluation strategies with respect to underrepresented stakeholder involvement and the distributed nature of design during the ongoing evolution of equitable access initiatives [6]. Mixed-methods studies, investigations into both participatory evaluation techniques and the participatory aspects of specific evaluation themes, and longitudinal studies that track cascading and multiscale impacts across sizable cohorts are all relevant methodological approaches [6]. Integration of these strategies enhances stakeholder involvement, illuminates the socio-technical dynamics governing inequities, broadens the impact and engagement of collective intelligence initiatives, and aids the stewardship of platform-based co-design opportunities [7].

Tools and Rubrics for Ongoing Accountability

Tools and rubrics for ongoing accountability involve a variety of methods and frameworks grounded in human-computer interaction research [8]. In facilitating the design, evaluation, and sharing of technical HCI toolkits, Arjona et al. 12 catalogue key resources in the SIGCHI Conference Proceedings pertaining to design processes,

evaluation techniques, user interface practices, and associated software. Marquardt et al. provide further guidance specifically on tools and rubrics for ongoing accountability in the development and evaluation of interactive systems [9]. Ongoing accountability tools and rubrics support critical reflection, evaluation, and discourse in design practices. Drawing on frameworks such as framing theory, discourse on practice, and critical design principles [2] propose tactics for evaluating and interpreting design outcomes. Cultural probes and aesthetic experience meetings elicit insights and enhance user engagement [8]. Embodied interaction and adversarial design ground design in real-world contexts and challenge conventions [9]. Collectively, these instruments foster criticality, transparency, and continuous improvement, ensuring design processes remain accountable and relevant over time [9].

Challenges, Trade-offs, and Ethical Considerations

Socially just design addresses the evolving conditions under which work occurs. Staff may prioritize economic and temporal constraints over normative notions of design justice, leading to designs that while participative and community-oriented fall short of deeper structural transformations [11]. Economic pressures, scheduling demands, and cultural norms frequently impede meaningful participation; establishing genuine engagement necessitates that the design framework articulates how norms constrain the desired freedom of action [12]. Although development frameworks often espouse complete participation and empowerment, such aspirations can be naïve [2]. In practice, even the most socially desirable designs are subverted for commercial gain, and externally sponsored inclusion may yield merely empowerment without true decision-making authority [13]. To counter these risks, organizations should assess their degree of involvement with social justice, critically appraising designs within disciplines where engagement does not equate to co-design. Adapting social frameworks to suit local organizational structures frequently proves necessary to achieve socially beneficial outcomes [5].

Balancing Usability with Justice-oriented Constraints

The tension between conflicting requirements is an ever-present challenge in the design of interactive systems and services. Engaging with and fulfilling all requirements is rarely possible. As a design-shaping principle, usability and the related human-centered design approach have gained significant prominence [12]. These approaches stem from the idea that the end-user, the intended beneficiary of technologies cannot be omitted from a design process that has an undeniable impact on the user's life [13]. The notion of usability corresponds to a definition that describes usability in terms of effectiveness, efficiency, and satisfaction in specified contexts of use [14]. When resources are limited, such as time, budget, or expertise, it is commonly accepted that not all usability principles can be adhered to. Numerous illustrative examples abound in the HCI literature that portray the trade-offs made by HCI specialists when prioritizing some usability principles at the detriment of others because of various types of limitations [6]. Justice-oriented design constraints involve similar challenges. Historically, attention to social justice issues in design has emerged sporadically, but it remains an area of work that is under active development. Justice-centered design approaches today build on long-standing design methodologies and processes, and with significant emphasis on co-designing alongside social stakeholders [14]. Considerations of social justice do not simply add additional constraints to a design; they reframe the impact of the outputs, and they further redirect decision-making and even the objectives of design itself. Thus, it is essential to specify the key principles of design justice and consider the extent to which the priority of such concerns diminishes or supersedes that of usability [15].

Risks of Performative Inclusion and Tokenism

The trend of "designing for," "inclusive design," and "empowering users" promotes the economic viability of marginalized groups and maintains their agency while attempting to uplift them. Although ostensibly inclusive and participatory, such efforts often co-opt agency without benefiting participants in line with their needs or goals, evoking tokenism [14].The incomplete engagement of diverse stakeholders leads to designs that embody majority agency, perpetuating existing values rather than fostering broader agency [15]. Efforts targeted at (under)represented groups, ideated by the same majoritarian voices, or motivated by economic inclusion of these groups yet ignoring constraints of the majority further enable this co-optation and violation [16]. Strategies for design justice in HCI and UX across the broader community, organization, design team, and individual designer remain necessary [17]. Orientation toward diversity, broad representation, and consideration of human rights, such as the right to participate and be represented, helps mitigate co-optation within inclusive and participatory design initiatives [18].

Contextual Adaptation and Cultural Relevance

Even as many communities work towards paring down their information and communication technology (ICT) systems to fit local needs, governments in some less prosperous regions continue to adopt foreign systems with little or no tailoring for local context and culture [5]. Many non-governmental organizations (NGOs) and local firms find themselves developing yet another major ICT system for a local or a transnational organization [6]. Yet by acquiring a good understanding of a community's problems and solutions based on its own local knowledge and practices, these NGOs can design "pick-up" systems that facilitate value-adding transactions among existing

local solutions. In such a community, more emphasis will need to be placed on interpersonal rather than on information-transfer problems to help commercialize existing homegrown solutions through various channels [15]. Few (if any) countries contain only one culture that can be characterized as different from the cultures of neighboring countries [7]. When compared with business practices in other countries, rural businesses in southern Switzerland may not appear particularly distinctive [8]. Overwhelmingly, however, business practices in southern Switzerland and among service-group enterprises in particular exhibit distinctive characteristics that identify southern Switzerland as a Business Culture Area (BCA) differing from surrounding BCAs [9]. Further distinguishing characteristics emerge, leading to the identification of five BCAs within southern Switzerland itself namely, Valais, Vaud, Fribourg, Neuchâtel, and guests of Neuchâtel [10]. The notion of a BCA thus proves useful. It facilitates the communication of a large amount of essential business-related information through relatively few concepts or constructs. At the same time, it enables the expression of the richness and diversity of actual Business Culture differences in an economically meaningful manner [16]. Despite strong interest in accessibility and usability, there is little discussion regarding their consideration in co-design. A forthcoming report will probe a diverse cross-section of the accessibility and usability topics, techniques, and methods used in co-design. Participatory design (PD) is a name used widely to specify different workshop formats worldwide [17]. In HCI accessibility/a11y refers to systems and interfaces designed to provide equal or lowered barriers to use by the widest audience without regard to their personal ableness/disability. A11y and usability continue to be yet another area of being discussed cross-culturally. The cultural properties of accessibility must be considered during cross-cultural co-design while challenges continue to exist regarding its consideration in PD during co-design [11, 18].

Implications for Practice, Policy, and Education

Attention to design justice has implications for the design of organizations and teams, educational programs, funding policies, and evaluation practices [10]. Justice-oriented design principles can be pursued by modifying existing structures and policies rather than creating entirely new systems. Design justice in HCI and UX concerns these institutional arrangements and their wider social implications [10]. A well-structured organization and an appropriate mix of team roles can facilitate accessibility-centered design work [2]. Extending this analysis, justice-oriented systems have similarly been proposed at the organizational level. Public policy both formal legislation and informal guidelines directs resources and activities toward state agendas, enabling or hindering design efforts in specific societal arenas [3]. Educational programs can also promote design justice, whether for developing new products or evaluating the design of ongoing systems. HCI19 introduced workshops on justice, solidarity, and care, suggesting a growing demand for such curricula [11]. These themes remain widely relevant, and establishing a dedicated curriculum would ensure more systematic incorporation [12]. Such a program might focus on enabling students to identify participants and participate effectively in critical domains; recognizing the roles designers can play in justice-oriented transformations; analyzing systemic wickedness and its juxtaposition in large organizations; and critically reflecting on the power relations embedded in contemporary design practices [13]. These competencies would give sufficient foundation to engage justice-oriented proposals in design practice at various skill levels [14].

Designing Organizations and Teams for Justice-oriented Work

Designing organizations and teams for justice-oriented work involves understanding how social justice issues manifest within HCI and participatory design [13]. Several key strategies are relevant: feminist methodologies, an ecological perspective, and principles of third-wave HCI emphasizing participation and sharing [14]. For instance, sex work and sexual interactions raise concerns about working conditions, safety, and supportive networks [15]. The focus on social justice informs broader engagement with marginalized communities, encourages exploration of social justice-oriented interaction design, and emphasizes relational expertise in developing inclusive, justice-driven organizational structures and teams [16].

Policy Implications and Funding Models

When deciding on the design of a public service provider, Beauchamp 1 asserts that representatives and legislators should keep in mind the values and principles that are central to the development of public service systems, particularly in democratic and liberal societies [14]. When the principles of equity and universality are adhered to, abiding by the latest principles of Universal Service as established by the OECD and the European Union, a better quality of the universal service will result. A general principle is then proposed for the establishment of such a service in the public interest that has a wider scope than the Mediated Communication Service [15]. The stated principles are assumed to promote the establishment of a structure for a universal communication service that, in any specific situation, is broad enough to represent all major technical developments and services considered relevant to society. Such a framework is best served by a collaborative and participatory model of service design [15].

Curriculum Design for Design Justice in HCI/UX

A curriculum design for design justice in HCI/UX programs focuses on concepts related to design justice and the complementary social justice principles necessary to address systemic inequities in design and technology [16].

The increasing demand for social justice-driven curricula in HCI/UX, articulated through the expansion of design justice as the leading response to this imperative, necessitates the development of recognizably design-just educational curricula [16]. A design-justice-oriented curriculum for HCI/UX encompasses educational goals, competencies, and evaluation criteria, supported by six contextualized examples that illustrate how practitioners address social justice-themed questions in various modes of design [16]. Such a curriculum fosters the growth of designers capable of interrogating underlying motivations and recognizing the role of design in upholding or amplifying ongoing mechanisms of oppression at both global and local scales [3].

CONCLUSION

Design justice reframes HCI and UX as sites of social transformation rather than neutral problem-solving disciplines. By foregrounding issues of power, representation, and systemic inequality, it challenges conventional design paradigms that prioritize efficiency and usability without interrogating broader social impacts. The frameworks and case studies examined demonstrate that justice-oriented design is not only feasible but essential in addressing disparities in access, participation, and technological outcomes. However, the implementation of design justice is neither straightforward nor universally consistent. Structural constraints such as limited resources, institutional inertia, and competing priorities often restrict the depth of participation and the redistribution of power. Additionally, the risk of performative inclusion underscores the need for genuine, sustained engagement with marginalized communities rather than superficial consultation. Balancing usability with justice-oriented objectives further complicates design processes, requiring practitioners to navigate trade-offs while maintaining ethical integrity. Evaluation metrics play a crucial role in advancing design justice by providing measurable indicators of both process and impact. The integration of mixed-methods approaches, participatory evaluation, and longitudinal studies enables a more comprehensive understanding of how design interventions influence equity over time. Moreover, tools and accountability frameworks support continuous reflection and adaptation, ensuring that justice remains central throughout the design lifecycle. Looking forward, embedding design justice into organizational structures, public policy, and educational curricula is vital for its sustained impact. Training designers to critically engage with power dynamics and equipping institutions with supportive governance frameworks can help bridge the gap between theory and practice. As digital technologies continue to shape social, economic, and political life, adopting a design justice perspective is imperative for creating systems that are not only usable but also equitable, inclusive, and transformative.

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