CONCEPTUALIZING UNIVERSAL DESIGN FOR THE INFORMATION SOCIETY THROUGH A UNIVERSAL HUMAN RIGHTS LENS

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ABSTRACT

Universal Design aims to ensure that everyone can equally use products, environments, programs, and services. This article examines the theoretical underpinnings and potential application of universal design by exploring its evolution through human rights and disability rights laws and policies. We maintain that universal design arises from the complex relationship between human rights, disability rights, and access to and use of technology. Consequently, we argue that in relation to the information society, it is most capable of promoting equal access and use of technology in three ways. First, universal design can increasingly account for human diversity. Second, universal design can progressively eliminate barriers to accessibility and usability. Third, universal design can augment broader participation in the design and development of technology. Conceptualizing universal design foundations of usability and accessibility of technology as universal human rights precepts embraces social equality for everyone, and incorporates important but currently exclusive disability rights precepts.

Keywords: universal design, information society, human rights, accessibility, persons with disabilities, disability rights, technology

1 INTRODUCTION

Since its introduction in the 1990s as an outgrowth of the disability rights movement in the United States, conceptualizations of universal design have consistently focused on creating products and services that are usable by everyone.[1] In so doing, universal design has provided a useful basis for identifying and removing usability barriers for products and services across a variety of applications in education, business, and other aspects of daily life. Universal design also overlaps with human rights principles in that it provides both a means and an end to ensuring that everyone enjoys the same privileges in using information and communications technology (ICT) to access their rights as active citizens in the information society.[2] Accordingly, researchers, practitioners, and policymakers have advanced notions of universal design in human rights law and policy[3] and

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All cited Norwegian materials were translated into English by Professor Giannoumis.
[1] Ostroff E, 'Universal Design: An evolving paradigm' in Smith KH and Preiser WFE (eds), *Universal design handbook* (McGraw-Hill 2011).
[2] *Ibid.*
[3] Lazar J and Stein MA, *Disability, human rights, and information technology* (University of Pennsylvania Press 2017).

in application to learning and education,[4] ICT research and development,[5] and sustainable development.[6]

Paralleling the emergence of universal design as part of the United States disability rights movement was passage of the Americans with Disabilities Act and its mandate of equal access to the socially constructed environment.[7] Concurrently, related concepts developed that included accessible design, barrier-free design, user-experience design, empathic design, user-centered design, and design for all.[8] While these schemas diverge in their scope and modality, they share a common emphasis on design as a means for promoting accessibility and usability. Universal design, however, is the only one of these models to have been adopted in a human rights convention, featuring prominently in Article 4 of the United Nations Convention on the Rights of Persons with Disabilities (CRPD).[9] By this provision, universal design recognizes that ensuring persons with disabilities equal access to ICT empowers them to realize attendant human rights arising from participation in all areas of social life.[10]

When universal design was conceived in the 1990s, it focused specifically on architecture and the built environment, and was rooted in physical accessibility for persons with disabilities.[11] The underlying rationale was that designing architectural and environmental spaces in a way that is inaccessible to persons with disabilities—i.e., that hinder or obstruct their access to those venues—violates their human rights to live independently, participate in society on an equal basis with others, and enjoy specific rights such as education and employment.[12] Consequently, inaccessibly built environments have come to represent one type of discrimination against persons with

[4] CAST, *Universal Design for Learning Guidelines* (2011).
[5] Vanderheiden G, 'Universal design and assistive technology in communication and information technologies: alternatives or complements?' 10 Assistive Technology 29.
[6] Vavik T and Keitsch MM, 'Exploring relationships between universal design and social sustainable development: some methodological aspects to the debate on the sciences of sustainability' 18 Sustainable Development 295.
[7] Public Law 101-336: Americans with Disabilities Act of 1990; and Stein MA, 'Same struggle, different difference: ADA accommodations as antidiscrimination' University of Pennsylvania Law Review 579
[8] *Supra* note 1.
[9] United Nations, *Convention on the Rights of Persons with Disabilities and Optional protocol* (United Nations 2006), *Article 4(1)(f)* 'To undertake or promote research and development of universally designed goods, services, equipment and facilities. . . which should require the minimum possible adaptation and the least cost to meet the specific needs of a person with disabilities, to promote their availability and use, and to promote universal design in the development of standards and guidelines'.
[10] Areheart BA and Stein MA, 'Integrating the internet' 83 Geo Wash L Rev 449
[11] Mace RL, 'Universal design in housing' 10 Assistive Technology 21.
[12] Lid IM, 'Accessibility as a Statutory Right' 01 Nordic Journal of Human Rights.

disabilities,[13] a principle that has subsequently been applied to ICT.[14] Universal design also reinforced the social model of disability that conceptualizes disability in relation to the socially constructed barriers that disable persons from participating in society.[15] It likewise provided a catalyst for grassroots efforts to extend the principles of accessibility of the built environment to other groups of people, prominently older persons.[16] Granted, it would have been impossible for the originators of universal design to anticipate the radical technological changes that have occurred since the 1990s. However, in applying universal design to ICT, scholars have continued the tradition of focusing exclusively on the needs of persons with disabilities.[17]

With the introduction of the CRPD, the United Nations reinstantiated the historical focus of universal design on persons with disabilities and its function as a disability-specific right, and elaborated on the scope and role of universal design for persons with disabilities within the context of the prevailing information society.[18] The CRPD also acknowledged some of the diverse and intersectional identities of persons with disabilities for whom equal ICT access enabled social inclusion. The Preamble, for example, recognized that the relationship between different forms of discrimination included 'colour, sex, language, religion, political or other opinion, national, ethnic, indigenous or social origin, property, birth, age or other status'.[19] Separate CRPD articles highlight the specific rights and needs of women and girls,[20] as well as children with disabilities.[21] The Committee on the Rights of Persons with Disabilities (CRPD Committee)—the body charged with

[13] CRPD Committee, *General Comment No. 2: Article 9: Accessibility* (2014) UN Doc CRPD/C/GC/2 Section 34 'Denial of access to the physical environment, transportation, information and communication, and services open to the public constitutes an act of disability-based discrimination that is prohibited by' the CRPD (art. 4, para. 1 (f)).

[14] CRPD, at art. 9(1) 'To enable persons with disabilities to live independently and participate fully in all aspects of life, States Parties shall take appropriate measures to ensure to persons with disabilities access, on an equal basis with others . . . to information and communications, including information and communications technologies and systems.'

[15] Lid IM, 'Developing the theoretical content in Universal Design' 15 Scandinavian Journal of Disability Research 203.

[16] Smith KH and Preiser WFE, *Universal design handbook* (McGraw-Hill 2011). Statistically speaking, aging and disability are inextricably linked, and disability rights advocates and scholars have considered aging a disabling process. See for example, Bickenbach J and others, 'Models of disablement, universalism and the international classification of impairments, disabilities and handicaps' 48 Social science & medicine (1982) 1173.

[17] Research has yet to come to a consensus as to whether designing ICT to be accessible for persons with disabilities constitutes conformity with principles of universal design. In contrast, research has emerged that suggests subsuming ICT accessibility as part of universal design overshadows the experiences of persons with disabilities. See Giannoumis GA, 'Framing the universal design of information and communication technology: An interdisciplinary model for research and practice' 229 Studies in health technology and informatics 492. We are therefore explicit in this article that a universal approach must also incorporate the needs of persons with disabilities.

[18] *Supra* note 3.

[19] CRPD, at Preamble (p).

[20] *Ibid.* at art. 6.

[21] *Ibid.* at art. 7.

monitoring and enforcing the treaty—in turn recognized that persons experience multiple forms of discrimination in its *General Comment No. 6* on equality and non-discrimination.[22] Throughout and consistent with a disability-targeted instrument, the CRPD did not explore universal design in relation to its impact on populations of persons without disabilities, such as digital divides,[23] even as it noted the digital divide affecting persons with disabilities.[24]

Notably, CRPD Article 9 obligates State Parties to ensure, among other things, access to ICT for persons with disabilities on an equal basis with others.[25] As such, it is the only human rights convention to recognize specifically that states have an obligation to promote access to the Internet as well as new ICT for persons with disabilities. Regarding universal design, the CRPD also is the only human rights treaty to obligate states to 'undertake or promote research and development of universally designed goods, services, equipment and facilities…to promote their availability and use'.[26] Subsequent to the CRPD's entry into force, the CRPD Committee had the opportunity to clarify the complex relationships between broader human rights issues such as multiple discrimination, intersectional discrimination based on characteristics other than disability, ICT accessibility, and universal design. Instead, *General Comment No. 2* treats ICT access generically by acknowledging the relationship between universal design and ICT but without providing a substantive consideration of state obligations. As a result, the CRPD Committee has not fully considered the application of universal design to ICT, nor articulated the relationship between obligations for universal design and ICT accessibility and their connection with other human rights concerns. In sum, the CRPD Committee elected not to consider the variety of domains within which universal design could be applied and the spectrum of human experiences it might empower.[27]

Aside from the CRPD, United Nations core human rights treaties do not recognize a state obligation to ensure access to ICT, although several keystone initiatives consider ICT a critical component of human rights regimes.[28] These include the World Summit on the Information Society,[29] the

[22] CRPD Committee, *General Comment No. 6: on Equality and Non-Discrimination*, UN doc CRPD/C/GC/6 (26 April 2018).
[23] See Ragnedda M and Muschert GW, *Theorizing Digital Divides* (Taylor & Francis 2017).
[24] CRPD, at art. 4(1)(f), 4(1)(g) and art. 9(1)
[25] *Supra* note 14.
[26] S*upra* note 19.
[27] For a discussion on intersectionality relating to disability among UN treaty bodies, see Skarstad K and Stein MA, 'Mainstreaming disability in the United Nations treaty bodies' 17 Journal of Human Rights 1
[28] An unresolved but highly interesting question is the extent of human rights obligations (as opposed to corporate social responsibility initiatives) of non-state actors, including corporations, that provide ICT.
[29] WSIS, 'Declaration of Principles: Building the Information Society: a Global Challenge in the New Millennium' World summit on the information society Section B3) 25. 'The sharing and strengthening of global knowledge for development can be enhanced by removing barriers to equitable access to information for economic, social, political, health, cultural, educational, and scientific activities and by facilitating access to public domain information, including by universal design and the use of assistive technologies.'

Sustainable Development Goals,[30] and Habitat III.[31] The United Nations agency responsible for ICT, the International Telecommunication Union (ITU), has recognized that access to ICT acts as a precondition for realizing a universal right to information, free expression, and political participation.[32] Likewise, the Global Initiative for Inclusive Information and Communication Technologies (G3ict) is a United Nations advocacy initiative aimed to facilitate CRPD implementation with respect to ICT accessibility.[33] Thus, despite extensive acknowledgment across the United Nations system, the CRPD is unique for legally cognizing ICT access as a human right.

Applying a universal human rights understanding to ICT access reaffirms the need for a comprehensive approach to universal design that supports the realization of human rights and the elimination of discrimination for all, while also reaffirming those rights by persons with disabilities. It thereby calls for a re-examination of the fundamental assumptions of universal design as a disability exclusive measure. Extending the dynamic of a disability human rights paradigm to vulnerable and marginalized populations empowers policymakers and practitioners to consider the ecumenical application of universal design and develop rationales for why it is best to include everyone as part of the predominating virtual universe, even as disability-specific needs continue to be addressed.[34] For example, a digital gender gap exists where women have access to ICT at a lower rate than men due to a variety of prejudicial factors.[35] Considering the digital gender gap from a truly *universal* design perspective—and in harmony with a disability human rights approach of 'nothing about us without us' that also incorporates the provision of equality measures[36]—provides a basis for identifying how the process of ICT design and development can ameliorate the digital gender gap. Such a reconceptualization of universal design necessitates that we critically re-examine its underlying principles.

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[30] ITU, 'SDG Mapping Tool' (2018) <https://www.itu.int/net4/CRM/SDG/#/home/home-page> accessed 19 August.

[31] Habitat III, *New Urban Agenda* (2017) Section 34 'We commit ourselves to promoting equitable and affordable access to sustainable basic physical and social infrastructure for all, without discrimination, including . . . *information and communications technologies*.'; and Section 36 'We commit ourselves to promoting appropriate measures in cities and human settlements that facilitate access for persons with disabilities, on an equal basis with others, to . . . public information and communication (including information and communications technologies and systems) and other facilities and services open or provided to the public, in both urban and rural areas.'

[32] Selian AN, 'ICTs in support of human rights, democracy and good governance' International Telecommunications Union.

[33] G3ict, 'About G3ict' (2016) <http://g3ict.org/about> accessed 5 September.

[34] *Supra* note 15

[35] EQUALS, 'Resources to help you advance digital gender equality.' (2018) <https://www.equals.org/resources> accessed 19 August.

[36] Michael Ashley Stein, 'Disability Human Rights' (2007) 95 *California Law Review* 75-133.

Coterminous with the CRPD coming into force in 2008, the Norwegian government enacted disability rights legislation that obliges service providers to ensure the universal design of ICT.[37] However, in enacting regulations to operationalize those requirements, Norway principally referred to criteria for web accessibility[38] which typically focus on access to the Internet for persons with disabilities.[39] Subsequent statements by the Norwegian Equality and Antidiscrimination Ombud (LDO)—the government body tasked with implementing and enforcing disability rights legislation—have buttressed this constrained approach to ICT universal design and its exclusive (albeit enormously beneficial) focus on persons with disabilities.[40]

In sum, since its introduction in human rights law and policy, universal design principles have been unfaithful to its inherent definition of being 'usable by all people, to the greatest extent possible'.[41] This is because human rights law and policy has not recognized the application of universal design to ICT, and thereby failed to acknowledge barriers that persons across the spectrum of human diversity experience accessing and using ICT. Hence the fundamental definition of 'universal' in universal design has been checked in favour of empowering but constrained disability rights considerations, and consequently is not addressed in universal design law and policy. We therefore aim to re-conceptualize universal design for the information society in relation to a revised set of principles that underlie the original and ambitious aims of universal design.

In a related vein, research has yet to theorize and operationalize universal design in a way that allows scholars and advocates to extend universal design to other socially disadvantaged groups and operationalize it in relation to accessibility. We therefore suggest that a mid-range theory of universal design could pose a more comprehensive solution of promoting universal design in human rights, and eliminating the barriers that persons across the spectrum of human diversity experience when accessing and using ICT. This model of universal design for the information society should take into account the relationship between universal design and non-discrimination, the rights of all persons to access and use ICT, the complex relationship between access and use, and the processes of designing and developing ICT.

The article proceeds in three parts. First, it sets forth the historical origins of universal design and its initial aspirations. Second, it analyses the adoption of universal design in the CRPD, in disability

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[37] Act June 20 2008 No 42 relating to a prohibition against discrimination on the basis of disability (the Anti-Discrimination and Accessibility Act).

[38] Ministry of Government Administration, Reform and Church Affairs, *Regulations for universal design of information and communication technology (ICT) solutions* (Ministry of Government Administration, Reform and Church Affairs 2013)

[39] Petrie H, Savva A and Power C, *Towards a unified definition of web accessibility* (ACM 2015)

[40] LDO, 'Funksjonsevne' (2018) <http://www.ldo.no/nyheiter-og-fag/klagesaker/funksjonsevne/> accessed 19 August.

[41] CRPD, at art. 2 '"Universal design" means the design of products, environments, programmes and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design. "Universal design" shall not exclude assistive devices for particular groups of persons with disabilities where this is needed.'

rights legislation in Norway, and the jurisprudence that has followed both. Third, it poses a reconceptualised set of universal design uniform principles for the information society. We conclude by summarizing our considerations for conceptualizing universal design through a universal human rights lens for the information society.

2 Historical Background for Universal Design

The introduction of universal design began a paradigm shift in research, policy, and practice to ensure that the widest possible population has access to products, services and environments.[42] Scholars have referred to universal design as an evolving paradigm that has emerged in various parts of the world due to disability rights advocacy and legislation.[43] As such, universal design complements the social model of disability by focusing on the barriers that persons with disabilities experience participating in society.[44]

2.1 Initial Conceptualizations

Following the emergence of universal design as a concept, the Center for Universal Design at North Carolina State University created a set of principles and related guidelines[45] to raise awareness of the benefits of realizing universal design in practice.[46] These standards have diffused globally as a comprehensive solution for ensuring access to the built environment and the use of products and services for persons with disabilities.[47] The dissemination of universal design principles has also included national and regional adaptations of universal design in disability rights law and policy.[48]

The principles of universal design also helped position it as an interdisciplinary topic that is relevant for a 'range of design disciplines including environments, products, and communications'.[49] Universal design edicts include equitable use, flexibility in use, simple and intuitive use,

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[42] *Supra* note 1.
[43] *Supra* note 15.
[44] Lid IM, 'Universal design and disability: An interdisciplinary perspective' 36 Disability and rehabilitation 1344
[45] Center for Universal Design, 'THE PRINCIPLES OF UNIVERSAL DESIGN' (1997) <https://projects.ncsu.edu/design/cud/about_ud/udprinciplestext.htm> accessed 1 Aug.
[46] The principles of universal design were funded under a grant from the National Institute on Disability and Rehabilitation Research (NIDRR), an agency formerly within the US Department of Education. Concurrently, NIDRR funded the development of a set of unified web accessibility guidelines which would later form the basis of the World Wide Web Consortium's (W3C) Web Content Accessibility Guidelines (WCAG). See *supra* note 45, and Vanderheiden G and Chisholm WA, 'Central Reference Document - Version 8 Unified Web Accessibility Guidelines' (*Web Accessibility Initiative Guidelines Working Grou*, 1998) <http://perma.cc/QL3D-8M37> accessed 23 December.
[47] *Supra* note 1.
[48] See for example in Norway 'Action Plan for Universal Design (2015), Council of Europe 'Achieving full participation through Universal Design' (2009), Inter-American Development Bank 'Operational Guidelines on Accessibility in Urban Development Projects with Universal Design Principles' (2004), and Japan 'General Principles of Universal Design Policy' (2005).
[49] *Supra* note 45.

perceptible information, tolerance for error, low physical effort, size and space for approach and use.[50] The guidelines, which further operationalize these seven principles, focus on the outcomes of the design process and provide a 'list of the key elements that should be present in a design'.[51]

2.2 Limitations to Universal Design

Despite the efforts of disability rights advocates and scholars involved in the development and dispersion of universal design principles and guidelines, challenges emerged that limited their impact. Universal design principles and guidelines were developed by a working group consisting primarily of scholars in architecture, product design, engineering, and environmental design.[52] While the working group represented several disciplines, the development and publication of their guidelines did not involve a broad range of stakeholders. In contrast, the creation of principles and guidelines by national and international standards organizations typically involved a broad range of stakeholders from academia, the public and private sectors,[53] and operated by consensus.[54] As a result, the principles of universal design were created without the input of a wider range of stakeholders and without a clear process for broad consent.

Since the introduction of universal design principles and guidelines, universal design has suffered from a lack of theorization.[55] The universal design working group unilaterally established universal design as a concept and then developed practice-based principles and guidelines based mostly on empirical evidence.[56] In doing so, it did not consider extant human rights theories and instruments in which to ground and inform universal design principles and guidelines.[57] Equally, the international scientific community—which included a broader range of perspectives such as human rights and legal scholars, sociologists, and political scientists—has yet to develop mid-range theories[58] aimed at enriching, framing and further operationalizing universal design as a social, legal, and political construct.[59] Mid-range theories also provide a basis for inferring universal design principles from empirical evidence.

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[50] Story MF, 'The Principles of Universal Design' in Smith KH and Preiser WFE (eds), *Universal design handbook* (McGraw-Hill 2011).
[51] *Supra* note 45.
[52] The universal design working group consisted of Bettye Rose Connell, Mike Jones, Ron Mace, Jim Mueller, Abir Mullick, Elaine Ostroff, Jon Sanford, Ed Steinfeld, Molly Story, and Gregg Vanderheiden. See *supra* note 45.
[53] Etzkowitz H and Leydesdorff L, 'The dynamics of innovation: from National Systems and "Mode 2" to a Triple Helix of university–industry–government relations' 29 Research policy 109.
[54] Brunsson N and Jacobsson B, *A world of standards* (Oxford University Press 2000).
[55] *Supra* note 15.
[56] Story MF, 'Maximizing usability: the principles of universal design' 10 Assistive technology 4
[57] *Ibid.*
[58] Mid-range theories typically use extant theories and empirical evidence to provide explanations for specific phenomena. See Bailey KD, 'Alternative procedures for macrosociological theorizing' 25 Quality and Quantity 37.
[59] *Supra* note 15.

As a result, two key areas of universal design remain under-operationalized. First, though universal design has been applied to create solutions that enable persons with disabilities to participate in society, scholars and practitioners have not extended the principles of universal design generally to other socially disadvantaged groups. For example, universal design could consider the barriers that persons experience using products and services due to race, gender, sexual orientation, language, religion, political or other affiliation, national, ethnic, indigenous or social origin, or other socioeconomic status. This constrained dynamic limits and narrows the interpretation of universal design from a means for promoting the use of ICT for everyone to a means for promoting its use by persons with disabilities. Second, the universal design principles and guidelines focus almost exclusively on the *use* of products, services and environments. While they also mention *access* in terms of accommodating users that are right- or left-handed[60] and minimizing potential errors or unintended consequences,[61] the universal design principles and guidelines do not provide clarification about the relationship between usability and accessibility. In other words, universal design scholars, practitioners, and policymakers have barely considered the inextricable link between access to and the use of ICT by socially disadvantaged groups and the role of access in terms of other human rights principles such as social justice and equality.

2.3 Possibilities for Further Refinement

The universal design working group might have ameliorated some of these challenges and helped realize the ambitious aims of universal design in two ways. First, the working group had the opportunity to harmonize universal design among international communities involved in adopting universal design in law, policy, and practice. It would have achieved this goal by proposing universal design principles and guidelines as the basis for a new standard pursuant to an international standards organization like the International Organization for Standardization or the International Telecommunications Union (ITU). Doing so would have integrated a diverse group of stakeholders in the development of universal design principles and guidelines. Moreover, the influence of a standards organization would facilitate the adoption of universal design principles and guidelines in human rights and disability rights laws and policies, and as practice-based policies and procedures for the ICT industry.

Second, the working group could have potentially improved the operationalization of universal design principles and guidelines by establishing a mid-range theory for universal design rooted in human rights and disability rights principles. It had an opportunity to pose a theory for implementing universal design in practice based on extant social and political models and theories,[62] informed by human rights and disability rights scholarship, and justified through empirical evidence. By creating a mid-range theory for universal design, the working group would have advanced a new understanding of universal design. As a result, universal design would have

[60] *Supra* note 45. Guideline 2b ‘Accommodate right- or left-handed access and use.’
[61] *Supra* note 45. Guideline 5a ‘Arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated, or shielded.’
[62] *Supra* note 58.

emerged as a higher-level concept with a mid-range theory, and a more evolved set of operational principles and guidelines. Using a mid-level theory of universal design to inform the adoption of universal design in human rights and disability rights laws and policies could have provided a basis for further considering the barriers that other socially disadvantaged persons experience using products, services, and environments, and rethinking the relationship between universal design and accessibility.

3 Universal Design in Law and Policy

Since the early 2000s, a paradigm shift occurred as national and supranational governments began to adopt universal design in disability rights laws and policies. In the early 2000s, the CRPD globally, and the Norwegian government domestically, emerged as leading proponents of universal design of ICT and integrated requirements for universal design in domestic disability rights instruments.

3.1 State of Universal Design in International and National Law

3.1.1 Social Equality and Non-Discrimination

The CRPD reaffirmed the fundamental tenet of the social model of disability, namely that unnecessary barriers disable persons with disabilities from fully participating in society. This stance is reflected in the CRPD Committee's *General Comment No. 6* on equality and non-discrimination which professes that the CRPD has moved disability rights from a 'formal model of equality to a substantive model of equality'.[63] In its view, formal equality refers to equal treatment whereas substantive equality 'seeks to address structural and indirect discrimination and takes into account power relations'.[64] Indirect discrimination is a principal feature of disability rights legislation in countries such as the United Kingdom where indirect discrimination refers to seemingly neutral policies or practices that disproportionately disadvantage particular members of society.[65] For the CRPD Committee, indirect discrimination relates to accessibility; it argues, for instance, that a state school would indirectly discriminate against students with intellectual disabilities by failing to provide books in Easy-Read formats.[66]

In *General Comment No. 2* on accessibility, the CRPD Committee further argues that the shift to substantive equality is reflected by States Parties' obligations to ensure ICT accessibility as a means to 'respect, protect and fulfil equality rights'.[67] From a universal design perspective, the CRPD Committee's position suggests that the application of universal design to products and services should ensure equal access for all consumers, including persons with disabilities.[68] Universal

[63] *Supra* note 22.
[64] Ibid. at Section 10
[65] Lawson A, *Disability and equality law in Britain : the role of reasonable adjustment* (Hart Pub. 2008)
[66] *Supra* note 22.
[67] *Supra* note 13.
[68] *Ibid.*

design could thus be inferred as a mechanism for promoting human rights more broadly and for specifically promoting substantive equality among disadvantaged groups of people, even if the CRPD Committee has been reticent to articulate such a position.

In sync with the CRPD, the aptly named Norwegian Anti-Discrimination and Accessibility Act 2008 (2008 Act) supports the position that universal design complements the social model of disability. Strikingly, the Norwegian government has taken a clearer position than the CRPD on universal design as a means for promoting disability rights, including the right to equality and non-discrimination. In the 2008 Act, Norway explicitly connected breaches of universal design to disability rights and non-discrimination. According to Section 30, 'discrimination shall be assumed to have occurred' in breaches of the rules on universal design.[69] As such, the Norwegian approach to universal design as a mechanism for promoting disability-related equality and non-discrimination extends the position implied by the CRPD Committee.

In Norway, the LDO considered the relationship between universal design and indirect discrimination.[70] The case (17/396) involved a Norwegian publishing company that was alleged to have violated the obligation for universal design of ICT in developing and publishing a mobile application for religious music.[71] According to the blind complainant, the features and functions of the mobile application were not universally designed. Further, that the mobile application cost more than the publisher's product alternatives, thereby constituting indirect discrimination. Ultimately, the LDO concluded that the publisher had not violated the obligation for universal design of ICT as that duty had not yet come into force. In addition, the LDO concluded that the price of the mobile application did not constitute indirect discrimination as there were reasonable grounds for the application's cost to be higher, and the cost did not disadvantage persons with visual impairments.

3.1.2 Human Diversity and Social Disadvantage

Pursuant to CRPD Article 2, universal design 'means the design of products, environments, programmes and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design'.[72] Given that the CRPD has been ratified by nearly all the Member States of the United Nations, this definition has global implications.

The reference to 'all people' in the CRPD's definition of universal design remains ambiguous, although the treaty provides a point of reference for further operationalizing universal design. Article 3 establishes the CRPD's fundamental principles including '[r]espect for difference and acceptance of persons with disabilities as part of human diversity'. The CRPD Committee further

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[69] *Supra* note 37.
[70] *Supra* note 71.
[71] LDO, 'Question about breach of the requirements for universal design of ICT (2017) <http://www.ldo.no/en/nyheiter-og-fag/klagesaker/funksjonsevne/17396-sporsmal-om-brudd-pa-kravene-til-universell-utforming-av-ikt-og-brudd-pa-diskrimineringsforbudet-en-forklarende-tittel/> accessed 31 May.
[72] CRPD, at art. 2

considered the relationship between diversity and universal design and argued that the application of universal design to ICT products and services should take into account everyone's 'inherent dignity and diversity'.[73] The CRPD additionally recognizes multiple forms of discrimination, and in particular the experiences of women and children with disabilities. From the perspective of universal design, the CRPD provides a legal and human rights framework for considering the relationship between universal design, human diversity, and the lived experiences of persons who face multiple forms of discrimination.

While the CRPD, the CRPD Committee, and the Norwegian government appear to agree on the relationship between universal design, disability rights, and non-discrimination, the definitions of universal design differ. According to the 2008 Act, universal design means 'designing or accommodating the main solution' so that it 'can be used by as many people as possible'.[74] As such, the definition for universal design adopted by Norway restrains the scope of universal design by shifting its application from 'all people', as set forth in the CRPD, to 'as many people as possible', while at the same time, as noted above, bolstering the connection between universal design and disability-specific rights.

3.1.3 ICT Accessibility and Usability

Another key consideration for universal design in human rights and disability rights laws and policies is its relation to accessibility. The provisions for universal design in the CRPD and 2008 Act differ from legal requirements to ensure ICT accessibility, such as those in the United States, United Kingdom or Australia.[75] The CRPD recognizes the close connection between universal design and accessibility. Section 16 of *General Comment No. 2* recognizes that universal design 'makes society accessible for all human beings, not only persons with disabilities'. Section 24 then states that 'all new … products and services have to be designed in a way that makes them fully accessible for persons with disabilities in accordance with principles of universal design'. The CRPD Committee thereby connected obligations for disability-related accessibility to 'all human beings' and provided a framework for considering universal design and accessibility in relation to broader human rights principles and concerns.

The CRPD Committee specifically addressed the relationship between accessibility and universal design in *Volker v. Austria*.[76] The case concerned the accessibility of live information in public transportation. According to the author of the complaint, who is blind, the tram stops in the city of Linz use digital audio systems to provide live transportation service information. Mr. Volker

[73] *Supra* note 67.
[74] *Supra* note 37. Section 13 states further that '…Public and private undertakings focused on the general public shall have a duty to ensure universal design of the undertaking's general function provided that this does not impose a disproportionate burden on the undertaking…'.
[75] Blanck P, *eQuality: The struggle for web accessibility by persons with cognitive disabilities* (Cambridge University Press 2014)
[76] CRPD Committee, *Communication No. 21/2014 Views adopted by the Committee at its fourteenth session (17 August-4 September 2015)* (Communication No 21/2014, 2015) UN Doc CRPD/C/14/D/21/2014

contended that a recent extension to the railway network failed to include digital audio systems, which prevented him from using the system on an equal basis with others. The CRPD Committee opined that, in this case, Austria failed to fulfill its obligations to ensure access to ICT for persons with disabilities on an equal basis with others. The CRPD Committee recommended that Austria build future public transportation networks 'in compliance with the principle of universal design'. In addition, Austria must generally ensure that disability rights laws explicitly include provisions for ICT accessibility and that '[l]egislation should incorporate and be based on the principle of universal design'.[77]

In a second case, the CRPD Committee addressed ICT accessibility in the context of usability. In *Given v. Australia,*[78] the CRPD Committee considered Ms. Given's right to vote using Australia's electronic voting systems, which are available for persons with visual impairments. Ms. Given, who has cerebral palsy but not a visual impairment, was refused access to an electronic voting system. The CRPD Committee concluded by recommending that Australia ensure that 'voting procedures, facilities and materials are … accessible and *easy to understand and use* [emphasis added]'.[79] According to the CRPD's definition, usability is a key component of universal design. The CRPD Committee's ruling suggests that accessibility and usability are distinct considerations in States Parties' obligations for promoting access to ICT.

In a third case, the CRPD Committee again considered ICT accessibility in the context of use. In *Nyusti and Takács v. Hungary*, the CRPD Committee considered access to automatic teller machines (ATMs).[80] The complainants, who are persons with visual impairments, claimed that they were unable to use the ATMs without assistance. As a result, they were unable to use the financial services that the ATM provided on an equal basis with sighted persons. Despite referring to the 'use' of ATMs in the background to the case, in considering the admissibility and merits of the case, CRPD Committee referred only to concerns relating to accessibility.[81]

In addition to connecting universal design to accessibility, the CRPD Committee provided a basis for applying universal design to ICT in its interpretive jurisprudence. In Section 15 of *General Comment No. 2*, the Committee commented that universal design of, among other things, ICT should 'ensure full, equal and unrestricted access for all potential consumers, including persons with disabilities, in a way that takes full account of their inherent dignity and diversity'.[82] While not providing a detailed comment on the application of universal design to ICT, the CRPD

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[77] *Supra* note 76.
[78] CRPD Committee, *Views adopted by the Committee under article 5 of the Optional Protocol, concerning communication No. 19/2014* (2018) UN Doc CRPD/C/19/D/19/2014.
[79] *Ibid.*
[80] CRPD Committee, *Communication No. 1/2010 Views adopted by the Committee at its 9th session, 15 to 19 April 2013* (2013) UN Doc CRPD/C/9/D/1/2010.
[81] *Ibid.*
[82] *Supra* note 13 at Section 15

Committee nonetheless seemingly supports the application of universal design to ICT as a mechanism for social participation.

To date, Norway is the only country where service providers have a legal obligation to ensure the universal design of ICT for persons with disabilities. In addition to this obligation, the 2008 Act requires all ICT solutions to be universally designed and that the requirement applies to ICT 'that support the undertaking's general functions and that are main solutions aimed or made available to the general public'.[83] Regulations pursuant to the obligation for universal design principally refer to criteria for ensuring ICT accessibility.[84] The LDO has heard several complaints regarding violations of the law. The majority of the complaints to address universal design of ICT, including case 17/396 (discussed both above and below)[85] have focused exclusively on the barriers that persons with disabilities experience using ICT.

While the CRPD recognizes the close connection between universal design and accessibility, the 2008 Act does not explicitly connect universal design to accessibility. Section 1 states, 'the purpose of this Act is to promote equality irrespective of disability' and then affirms that equality means, among other things, accessibility.[86] The 2008 Act does not contain further provisions related to accessibility. However, the emphasis of the 2008 Act on universal design suggests that Norway considers universal design for persons with disabilities as a mechanism for promoting accessibility in relation to broader human rights considerations such as equality and non-discrimination.[87]

3.1.4 Participatory Processes

The CRPD's obligations for universal design in standardization relates to the principle of 'nothing about us without us', one of the central tenets of the disability rights movement. Accordingly, the CRPD contains key provisions for promoting the substantive participation of persons with disabilities in policy processes.[88] According to Article 4, States Parties have an obligation to

[83] *Supra* note 37. Section 14.
[84] *Supra* note 38. Section 1 'The purpose of the regulation is to ensure universal design of information and communication technology solutions without causing a disproportionate burden on the business. By universal design is meant that the design or organization of the main solution in information and communication technology is such that the company's general function can be used as widely as possible.
[85] *Supra* this article Sections 3.1.1 and *infra* this article Sections 3.2 and 3.3.
[86] *Supra* note 37. Section 1 'The purpose of this Act is to promote equality irrespective of disability. Equality shall mean: a) equal status, b) equal opportunities and rights, c) accessibility, and d) accommodation. This Act shall help to dismantle disabling barriers created by society and prevent new ones from being created.'
[87] Section 10.2.4.4 of the Norwegian government's proposal for the Anti-Discrimination and Accessibility Act 2008 stated, 'The rules on universal design involve more than accessibility. … the rules on universal design will extend beyond protecting people with disabilities. A number of people will benefit from universally designed … ICT, as universal design will simplify usage and improve access for the majority of users in general, and separate groups such as pregnant women, users with young children and older persons'. See Department of Children, Equality and Social Inclusion, Ot.prp. nr. 44 2007-2008 Proposal for a law prohibiting discrimination on grounds of disability (Discrimination and Accessibility Act) (2008).
[88] Stein MA and Lord JE, 'Jacobus tenBroek, Participatory Justice, and the UN Convention on the Rights of Persons with Disabilities' 13 Tex J on CL & CR 167.

'closely consult with and actively involve persons with disabilities' in law and policy processes and in other decision-making processes relevant for persons with disabilities.[89] The CRPD Committee has recognized the role of participation in standardization. In its view, technical criteria for accessibility 'must be developed in close consultation with persons with disabilities and their representative organizations' and 'must be adopted in consultation with organizations of persons with disabilities'.[90] The CRPD Committee takes a similar view to laws and regulations arguing for interdisciplinary dialogue and that 'the review and adoption' of laws and regulations should be 'carried out in close consultation with persons with disabilities and their representative organizations … as well as all other relevant stakeholders'.[91] It includes, by way of example, 'members of the academic community and expert associations of architects, urban planners, engineers and designers'.[92]

The CRPD has taken a strong position on the participation of persons with disabilities and civil society organisations in policy processes. In *General Comment No. 2* the CRPD Committee cites the 'insufficient involvement of persons with disabilities and their representative organizations in … ensuring access to … information and communication'.[93] However, the Committee has stopped short of recognising the role of participation in the design, development, and procurement of ICT. The CRPD text clearly maintains that the substantive participation of persons with disabilities is integral to policymaking and awareness raising. However, despite substantive research showing the benefits of persons with disabilities' participation in the design and development of accessible ICT,[94] the CRPD Committee has not recognized the integral role that persons with disabilities can play in shaping how ICT is designed and developed; this absence continues, ironically, in its draft *General Comment No. 7* on participation.[95]

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[89] *Supra* note 14. Article 4(3) '3. In the development and implementation of legislation and policies to implement the present Convention, and in other decision-making processes concerning issues relating to persons with disabilities, States Parties shall closely consult with and actively involve persons with disabilities, including children with disabilities, through their representative organizations'.

[90] The CRPD Committee also discussed participation in law and regulation. *Supra* note 13, Section 28 'Disability laws often fail to include ICT in their definition of accessibility, and disability rights laws concerned with non-discriminatory access in areas such as procurement, employment and education often fail to include access to ICT and the many goods and services central to modern society that are offered through ICT. It is important that the review and adoption of these laws and regulations are carried out in close consultation with persons with disabilities and their representative organizations (art. 4, para. 3), as well as all other relevant stakeholders, including members of the academic community and expert associations of architects, urban planners, engineers and designers.'

[91] *Supra* note 13 at Section 28.

[92] *Ibid.*

[93] *Supra* note 13 at Section 10.

[94] Lazar J, Feng JH and Hochheiser H, *Research Methods in Human-Computer Interaction* (Elsevier Science 2017)

[95] See CRPD Committee, General comment on article 4.3 and 33.3 of the convention on the participation with persons with disabilities in the implementation and monitoring of the Convention (2018) DRAFT.

In 2013, the Norwegian government issued regulations for universal design of ICT that refer to a variety of technical criteria related to human-computer interaction including standards for web accessibility.[96] While Norway has not explicitly promoted the participation of civil society organizations in policy processes (conceivably a violation of its 2013 CRPD ratification), as part of the 2008 Act, the Norwegian standards organization, Standards Norway, published guidelines on universal design with a particular focus on user participation in ICT development.[97]

3.2 Ambitious Aim without Clear Guidance

Despite efforts on behalf of the United Nations and the Norwegian government, universal design as a mechanism for promoting human rights and disability rights has yet to fulfil its ambitious aims. While the 2008 Act provides clear guidance on the legal requirements for universal design of ICT in the form of regulations and standards, the CRPD Committee has yet to clarify States Parties' obligations for universal design. To its credit, the CRPD Committee referenced universal design in relation to obligations for accessibility, and specifically ICT accessibility, in *Volker v. Austria.* It nonetheless did not provide a clear application of universal design principles to violations of disability rights under the CRPD or to violations of state obligations for ensuring ICT accessibility. And, although the CRPD Committee recommended applying the 'principle of universal design' to transportation networks and disability rights legislation, they did not further articulate to which universal design principle or principles *General Comment No. 2* referred. Moreover, the CRPD Committee is not consistent with whether universal design constitutes a set of principles as referenced in Section 24, or a single principle as referenced in Section 28.[98] As a result, the CRPD Committee has yet to provide clear guidance around the operationalization of universal design and universal design principles in the context of human rights and disability rights laws and policies.

Both the CRPD and the 2008 Act provide a legal framework for recognizing that universal design can promote the human rights of and equality for socially disadvantaged groups, including persons with disabilities and older persons. However, both laws stop short of recognizing the application of universal design to other forms of discrimination. Basically, the CRPD and the 2008 Act have limited whether and to what extent universal design may be adopted as a mechanism for promoting the use of ICT across the spectrum of human diversity and in particular across forms of social disadvantage other than disability. This contradicts the ethos of universality, which is fundamental

[96] *Supra* note 38. Section 4 requires that the design of ICT solutions comply with a variety of standards related to human-computer interaction including the de facto industry standard for web accessibility, the Web Content Accessibility Guidelines (WCAG).
[97] Standards Norway, *Universal design User participation and ICT* (NS 11040:2013 2013).
[98] *Supra* note 13, See Section 24 '…All new objects, infrastructure, facilities, goods, products and services have to be designed in a way that makes them fully accessible for persons with disabilities, in accordance with the *principles* of universal design [emphasis added]…'and Section 28 '…Legislation should incorporate and be based on the *principle* of universal design, as required by the Convention [emphasis added]…'.

to how universal design has been conceptualized since its origins,[99] and opposes the spirit of universal design as a mechanism for promoting the use of ICT for everyone.

The CRPD emerged due, in part, to the lack of explicit recognition for disability rights under other human rights laws such as the Universal Declaration for Human Rights, the International Covenant on Civil and Political Rights, and the International Covenant on Economic, Social and Cultural Rights.[100] Accordingly, the CRPD articulated these rights with respect to disability. Thus, CRPD obligations for universal design fundamentally aim at ensuring persons with disabilities are included in society on an equal basis with others. However, with the introduction of universal design as an obligation for States Parties, the Ad Hoc Committee, which was responsible for negotiating the CRPD, did not consider the relationship between universal design and other forms of social disadvantage. Essentially, the absence of the 'universal' in considering universal design, which has been perpetuated by the CRPD Committee, has acted to limit and constrain whether and to what extent universal design may be extended to other forms of social disadvantage. As a result, other forms of social disadvantage have been excluded from universal design, which in turn reinstantiates universal design as a disability-specific consideration,

In addition, neither instrument considers the relationship between universal design and multiple forms of discrimination. Section 30 of *General Comment No. 2* considers the relationship between international standards and universal design. However, the CRPD Committee cites standards and guidelines that only reference persons with disabilities and older persons, inconsistent with its earlier claims that universal design refers to 'all human beings … not only persons with disabilities'.[101] In Norway, case 17/396 provides a useful basis for considering the relationship between universal design and other forms of social disadvantage, specifically socioeconomic status. Research has examined the complex interrelationship between socioeconomic status, poverty, and disability, and has shown that self-reinforcing social and economic determinants systematically disadvantage persons with disabilities.[102] While the LDO did not consider the overlapping forms of social disadvantage in case 17/396, the ruling provides a useful point of departure for considering the relationship between the economic barriers persons with disabilities experience accessing ICT and using ICT. As a result, neither the United Nations nor the Norwegian government have clarified to what extent universal design applies to broader human rights concerns, and specifically, to issues related to equality and non-discrimination for persons that experience social disadvantage other than disability.

Both the CRPD and 2008 Act recognized the relationship between universal design and accessibility. However, neither has clarified this relationship.[103] In *General Comment No. 2*, the

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[99] *Supra* note 45.
[100] Kayess R and French P, 'Out of Darkness into Light? Introducing the Convention on the Rights of Persons with Disabilities' [Oxford University Press] 8 Human Rights Law Review 1
[101] *Supra* note 13 at Sections 16 and 30.
[102] Eide AH and Ingstad B, *Disability and poverty : a global challenge* (Policy Press 2011)
[103] *Supra* note 17.

CRPD Committee recognizes that the scope of universal design applies to everyone, including persons with disabilities.[104] It then opines that disability rights legislation often fails to include ICT as an explicit component of accessibility, and asserts that pursuant to the CRPD '[l]egislation should incorporate and be based on the principle of universal design'.[105] Article 4(1)(f), however, requires States Parties only to 'promote universal design in the development of standards and guidelines'.[106] The CRPD Committee thereby fails to consider the relationship between universal design in legislation and standards and guidelines. It also avoids commenting on the relationship between universal design and ICT accessibility. Further, *General Comment No. 2*, turns from a general statement about universal design, to universal design in application to the built environment, and thence to ICT accessibility, all without providing clarification about the relationship between these overlapping concepts and practical applications. In *Given v. Australia* and *Nyusti and Takács v. Hungary,* the CRPD Committee considers the relationship between accessibility and usability, suggesting that accessible information is easy to use and understand.[107] However, it did not make an explicit connection between use, universal design, and accessibility.

While Norway has considered the relationship between disability rights and the universal design of ICT, the CRPD Committee has yet to fully consider the application of universal design to ICT and as it relates to the rights of persons with disabilities to participate in social life.[108] According to the CRPD Committee, universal design provides a mechanism for ensuring access to ICT for all consumers.[109] It goes on to state that persons with disabilities and others should be able to access information and communication and recognizes that the application of universal design does not imply that technical aids and live assistance are unnecessary.[110] In particular, as the CRPD Committee points out, the early application of universal design can reduce the costs of remediating inaccessible ICT and is therefore more economical to introduce universal design at the earliest possible stage of ICT design and development.[111]

3.3 Considering the Potential of Universal Design

The CRPD Committee and the Norwegian government, severally and jointly, had opportunities to advance a more nuanced understand of universal design in five ways.

First, the CRPD Committee should have substantially clarified the responsibilities of States Parties in realizing their obligations for universal design by articulating a principle or set of principles for universal design. The CRPD Committee repeatedly refers to the adoption of universal design

[104] *Supra* note 13 at Section 15.
[105] *Supra* note 13 at Section 28.
[106] *Supra* note 9.
[107] *Supra* notes 78 and 80
[108] *Supra* note 13 at Section 15.
[109] *Ibid.*
[110] *Ibid.*
[111] *Ibid.*

principles in different application settings[112] although neither the CRPD's text nor *General Comment No. 2* clearly enumerate those principles. As a result, there is little clarification on the implementation of universal design in the context of disability rights, or human rights more broadly. The CRPD Committee has likewise recognized the application of universal design to ICT,[113] but without clear guidance that enumerate the principles of universal design. Thus, states and others may struggle to understand the full implications of universal design of ICT for disability rights and human rights.

Second, the CRPD Committee should have explicitly connected universal design with the human right to non-discrimination. It does connect non-discrimination to accessibility, but then seems to suggest that while universal design can promote equality for everyone it is only in relation to accessibility that universal design relates to non-discrimination.[114] This interpretation is antithetical to the CRPD Committee's recognition that universal design applies to the diversity of the human experience.[115] Instead, the CRPD Committee could have tracked Norway's approach of clearly connecting universal design to non-discrimination.[116] This approach extends notions of universal design of ICT to the human rights of other disadvantaged groups. The linkage simultaneously acts to mainstream universal design as a broader approach to ensuring universal rights as well as a targeted approach to eliminating identity-specific barriers to using ICT. Such a scheme avoids singularly protecting persons with disabilities and is consistent with scholars' interpretation of the CRPD as having changed the broader framework for conceptualizing human rights.[117]

Third, both the United Nations and the Norwegian government should have explicitly recognized that universal design ought to be applied to the human rights of all socially disadvantaged persons. This would extend universal design to the diversity of the human experience including persons that experience multiple forms of discrimination and discrimination based on grounds other than disability. Doing so would establish a framework for realizing the universality of universal design. It also would strengthen the inclusive nature of universal design as a mechanism for promoting the use of ICT as a human right for everyone. Although the CRPD Committee has yet to hear a case concerning universal design or ICT accessibility that explicitly considers other forms of social disadvantage beyond disability, Norway did in case 17/396.[118] There, the LDO had ample opportunity to recognize the overlapping forms of discrimination that occur at the intersection between disability and socioeconomic status. Such a reading would have contributed to a more

[112] *Supra* note 13.
[113] *Ibid* at Section 15.
[114] *Ibid* at Section 23.
[115] *Ibid* at Section 16
[116] *Supra* note 38.
[117] Lang R and others, 'Implementing the United Nations Convention on the rights of persons with disabilities: principles, implications, practice and limitations' 5 ALTER - European Journal of Disability Research / Revue Européenne de Recherche sur le Handicap 206
[118] *Supra* note 71.

nuanced understanding of the relationship between the ability to access ICT (here, because of cost) and to use ICT (i.e., its usability).

Fourth, the United Nations and Norway can each consider and articulate more clearly the relationship between universal design and accessibility. While both the CRPD and the 2008 Act recognize that universal design relates to accessibility, neither the CRPD Committee nor the Norwegian government have clarified whether and to what extent universal design relates to accessibility. Pointedly, the definition of universal design under the CRPD relates exclusively to use, while obligations for accessibility typically refer to access.[119] Thus, the relationship between access and use is unclear. In *Given v. Australia,* the CRPD Committee suggests that access and use are distinct characteristics of a State Parties obligation to ensure ICT accessibility.[120] However, it stops short of fully considering the relationship between access and use, namely, whether use presupposes access, whether access and use are mutually exclusive considerations, or whether access may be subsumed under use.[121]

Fifth, the United Nations and Norway can advocate for more fully universal design not only as an outcome—i.e., as a quality of a good or service—but also as a process of producing goods and services. Despite clear considerations by the CRPD Committee for the substantive participation of persons with disabilities in law and policy processes, in awareness raising, and as market actors, the CRPD Committee made no consideration of the role of persons with disabilities in designing and developing new ICT. This oversight continues in the draft *General Comment No. 7* on participation.[122] While Norway has supported the publication of guidelines for ensuring the participation of persons with disabilities in standardization processes,[123] it also has not considered the participation of persons with disabilities in the design and development of ICT as a component of service providers' obligations for universal design of ICT.[124] Hence, both the CRPD Committee

[119] Though the CRPD does not provide a definition for access or accessibility, it does contain 33 references to access and 27 references to either accessible or accessibility. At times, the CRPD appears to use access and accessibility interchangeably. For example in Article 9(1), *supra* note 14, which lays out the obligations for accessibility under the CRPD, the CRPD obligates States Parties to 'take appropriate measures to ensure to persons with disabilities *access*, on an equal basis with others [emphasis added]' and those measures shall 'include the identification and elimination of obstacles and barriers to *accessibility* [emphasis added]'. At other times the CRPD suggests that they are distinct characteristics. For example in Article 30(1)(a) and (b), which lay out the rights for persons with disabilities to participate in cultural life, recreation, leisure and sport. According to Article 30(1), 'States Parties recognize the right of persons with disabilities to take part on an equal basis with others in cultural life, and shall take all appropriate measures to ensure that persons with disabilities: (a) Enjoy access to cultural materials in accessible formats; (b) Enjoy access to television programmes, films, theatre and other cultural activities, in accessible formats'. Here it appears the CRPD considers access to be a separate consideration from 'accessible formats'.
[120] *Supra* note 78.
[121] *Supra* note 17.
[122] *Supra* note 94.
[123] *Supra* note 97.
[124] *Supra* note 37.

and the Norwegian government have eschewed opportunities to explicitly recognize the participation of persons with disabilities as an essential component of universal design.

4 Towards a Uniform Set of Principles for Universal Design in the Information Society

Despite some progress towards ensuring universal design of ICT, the ambitious aims of universal design have yet to be realized in policy or practice. While the United Nations and Norwegian government have led the adoption of universal design in law and policy, the implementation of universal design obligations have catalyzed an opportunity to pose a uniform set of principles of universal design for the information society. In order to realize the vision of universal design, these principles should address—i.e., equality and non-discrimination, diversity and social disadvantage, access to and use of ICT, and ICT participatory design and development processes.

First, considering universal design's relevance for disability rights and the social model of disability, a set of principles for universal design should take into account the relationship between universal design and broader human rights notions of non-discrimination. This article argues that universal design should be viewed in the context of discrimination, and as such, breaches of universal design should be considered an act of discrimination. While universal design has traditionally remained untethered to notions of equality and non-discrimination, a more structured approach for understanding universal design should use equality and non-discrimination as a reference point for implementing universal design in policy and practice. Such an approach would position universal design, similar to accessibility, as a mechanism for promoting equality. While viewing universal design in the context of discrimination does not preclude the need for assistive devices and technical aids, where necessary, it redirects focus from a responsive to a more active consideration of ICT usability by positioning universal design as an immediate rather than a secondary concern in the design and development of ICT. Doing so animates and frames the implementation of universal design in policy and practice with overarching human rights concerns of equality and non-discrimination. By considering equality and non-discrimination, service providers have the opportunity to ensure the usability of ICT for everyone prior to its development, procurement, or adoption.

Second, considering the relationship between universal design and human diversity, a set of principles of universal design should take into account the experiences of persons that face multiple forms of discrimination and persons that face discrimination based on forms of social disadvantage other than disability. This article argues that the ambitious aim of universal design—i.e., to promote the use of ICT for everyone—involves a more nuanced consideration of the barriers that 'everyone' experiences using ICT. Universal design has traditionally been associated with the experiences of persons with disabilities. However, a more nuanced understanding of universal design should additionally consider the barriers that all socially disadvantaged persons experience using ICT including, for example, persons that face discrimination based on colour, sex, language, religion, political or other opinion, national, ethnic, indigenous or social origin, property, birth, age or other status. As a result, universal design can ensure a truly universal experience by considering the

barriers that people experience using ICT across all forms of social disadvantage. In addition, the complex, overlapping, and multidimensional barriers that exist at the intersection of multiple forms of social disadvantage should be at the forefront of how universal design is conceptualized. In this way, universal design acts to extend notions of accessibility and usability to other forms of social disadvantage. In practice, by taking into account the diversity and complexity of the human experience in identifying and remediating barriers to using ICT, service providers can more fully ensure the usability of ICT and as a result promote equality and non-discrimination for everyone, even as they ensure the rights of persons with disabilities.

Third, considering the ambiguous though interdependent relationship between universal design and accessibility, a set of principles for universal design should take into account both access to and use of ICT. This article argues that accessing ICT and using ICT are mutually inclusive concepts, that they cannot be considered in isolation, and that access and use are necessary but not sufficient conditions for achieving universal design as other assistive devices or technical aids may be necessary in ensuring universal design. While definitions of universal design have focused exclusively on 'use', taking into account access as an interdependent component of use extends universal design considerations from simply *how* ICT is used, to include broader considerations of *whether* and *to what extent* ICT can be accessed both with and without assistive technologies and technical aids. As such, a universal design approach to developing ICT should consider the barriers that people experience in terms of both access and use. In this way, universal design provides a means for ensuring that everyone has the opportunity to use ICT, as access to ICT, and that the action of using ICT is effective, efficient, and satisfying.[125] By taking into account both access to and use of ICT, service providers can ensure that everyone has the opportunity to participate in the information society equally.

Fourth, considering universal design as both a process and an outcome, a set of principles for universal design should take into account user participation as an integral element in the design and development of ICT. This article argues that in order to ensure universal design as an outcome, persons that experience barriers accessing and using ICT should be substantively involved throughout the process of designing and developing ICT. As such, universal design builds upon disability rights principles and CRPD obligations for promoting the participation of persons with disabilities in policy processes by explicitly recognizing the influence of ICT design and development in shaping social life. The substantive involvement of persons who experience barriers accessing and using ICT in design and development processes, including persons with disabilities, provides a mechanism for remediating those barriers at an early stage. As a result, service providers can ensure accessible and usable ICT products and services for everyone.

[125] The International Organisation for Standardisation conceptualizes usability in relation to three parameters including efficacy, efficiency, and satisfaction. See ISO, *9241-210:2010 Ergonomics of human-system interaction* (2010) Section 2.13 'usability', 'extent to which a system, product or service can be used by specified users to achieve specified goals with *effectiveness, efficiency and satisfaction* in a specified context of use [emphasis added]'.

These four areas of equality and non-discrimination, diversity and social disadvantage, access to and use of ICT, and ICT participatory design and development processes, provide a new lens for capturing the complex and ambitious aims that form an intrinsic part of universal design. By explicitly considering these four areas, to which previous proponents have only alluded, this article provides a fresh perspective and renewed consideration for universal design not only as a narrow (albeit crucial) means of promoting accessibility for persons with disabilities, but for framing universal design as a means to promote substantive equality for everyone. Reframing universal design in this way provokes consideration of human rights and disability rights in relation to the barriers that persons across the spectrum of human diversity experience both accessing and using ICT. Shifting focus from universal design as an outcome to universal design as a process, precipitates policymakers and practitioners to help remediate the barriers people experience accessing and using ICT by ensuring their substantive participation in ICT design and development processes. Thus, this article argues that universal design can only achieve its ambitious aims by taking fuller account of the principles inherent in the universal design of ICT. While the four areas outlined provide a point of departure for advancing a set of principles of universal design for the information society, additional consideration of the practical limitations of universal design is necessary in order to more clearly enumerate the utility of these principles.

5 Conclusion

Since the 1990s, universal design has posed a singular challenge: to ensure that everyone can use ICT equally. This article examined the theoretical implications of universal design and posed a new framework for realizing its ambitious aims in the era of the information society. It also argued that a model of universal design for the information society provides an essential reframing of the traditional and sometimes conflicting principles of universal design and takes into account the necessity that access to and use of ICT has for realizing the human rights of all disadvantaged persons. This new set of unified principles of universal design for the information society may redirect the trajectory of universal design in an effort to evolve our understanding of universal design in light of its application to ICT. These principles recognize the root of universal design in human rights and disability rights and provide a framework for eliminating the barriers that persons experience accessing and using ICT across the diversity of the human experience.

This article has argued that the adoption of universal design in human rights and disability rights law and policy has limited its scope of application and policymakers have not yet fully considered the fundamental principles of universal design. It has posed a new set of principles, which underlie the ambitious aims of universal design and provide a richer more comprehensive approach to realizing universal design in practice. As a result, these principles can provide a basis for scholars and advocates to apply universal design to ICT and to extend universal design to other socially disadvantaged groups. They can further provide a basis for a mid-range theory of universal design that takes into account the relationship between universal design and non-discrimination, the experiences of persons subject to multiple forms of discrimination and discrimination on grounds

other than disability, the complex relationship between access to and use of ICT, and the processes of designing and developing ICT.

Ultimately, the universal design paradigm asserts that ensuring equality requires equal access to and use of ICT. This article has repositioned universal design as a concept rooted in human rights, animated by principles of social equality and non-discrimination, framed by issues of diversity and social disadvantage, focused on ICT usability and accessibility, and supported by participatory processes in ICT design and development. This conceptualization embraces universal design for the information society as promoting equality for all socially disadvantaged groups rather than a unique disability-specific legal and social obligation. A uniform set of universal design principles is capable of promoting equal access and use of ICT in three ways: first, it can account for human diversity across all socially disadvantaged groups; second, it can eliminate barriers to both accessibility and usability; and third, it can promote the participation of socially disadvantaged persons in the design and development of ICT.