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Child Rights Impact Assessment: A Policy Tool for a Rights-Respecting Digital Environment

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ABSTRACT

Businesses that develop digital products and services often anticipate generic users, paying insufficient attention to the needs and rights of children who may use or be impacted by their practices. This article investigates the potential of child rights impact assessment (CRIA) as a policy tool to protect and respect children's rights in the tech sector. The methods draw on desk research, interviews with product designers and developers, and a review of how child rights impact assessment is currently deployed by tech businesses. The results show that both regulation and advocacy have increased businesses' attention to children's rights, as set out in the UN Convention on the Rights of the Child. Good practice is most evident as a response to data protection regulation introduced by governments, as well as by telecommunications companies in response to advocacy by UNICEF and others. However, the findings also reveal multiple barriers to the use of child rights impact assessment, and only partial implementation of the tool in practice. We conclude with recommendations for greater multistakeholder efforts to increase its application and effectiveness, so as to facilitate children's rights in the digital environment.

1 | Introduction

Digital technologies underpin children's lives at home, school and elsewhere. While they promise ample opportunities for learning, communication and play, children's needs and interests are underrepresented in the policies, design and development of today's digital environment. Even though children comprise one in three of the world's internet users, with all children, in one way or another, increasingly affected by technological innovation (Livingstone et al. 2015), digital business models seek to maximize the attention of markets conceived in generic terms. Indeed, businesses typically overlook the specific needs and interests of children and young people (Lenhart and Owens 2021), even if they intend to appeal to or impact on children. Human and child rights experts have proposed that, insofar as the digital environment is not designed with children in mind (B-Tech 2024; Council of Europe 2018; D4CR Association 2020; OECD 2024b), "by design" approaches are vital to embed privacy, safety, security, ethics, inclusion and wellbeing in the development of digital products and services (Nash and Felton 2024). These values and more could be encompassed in a holistic framework to realize "children's rights by design" (Livingstone and Pothong 2023).

But how are businesses and other actors, including states, to know when child rights issues arise in their policies, design and development processes? The *Universal Declaration of Human Rights* (UN (United Nations) 1948, Article 25(2)) and the *UN Convention on the Rights of the Child* (UNCRC) (1989, p. 1) recognize that "childhood is entitled to special care and assistance." Defining children as everyone younger than 18 years old, the UNCRC's 54 articles encompass all the rights to life, protection, nondiscrimination, privacy and civil freedoms in international human rights frameworks, also adding children's

rights to information and beneficial media, play, support for development to their fullest potential, and provisions regarding caregiving and guardianship by parents and the state. Further provisions include the principle of evolving capacity (Article 5) which requires treating children according to their growing maturity and autonomy, while also providing for their vulnerability (Lansdown 2005), and ensuring that "[I]n all actions concerning children, whether undertaken by public or private social welfare institutions, courts of law, administrative authorities or legislative bodies, the best interests of the child shall be a primary consideration" (Article 3). Crucially, at the heart of the UNCRC is the idea of the child as a rights-holder and the requirement that states consult children on matters that affect them (Article 12).

Applying the UNCRC to businesses, especially businesses that develop digital products and services, is difficult. Many efforts are underway in response to considerable media and public concern about the problems the digital environment can pose to children, but significant barriers exist. Although the UNCRC has been ratified by nearly every country in the world, a notable omission is the USA (Congressional Research Service 2015). This matters for the digital environment, given the power of Silicon Valley and the importance of the US Constitution and courts in regulating these companies. Partly for these reasons, there are concerns that policymakers regulating the tech sector have insufficient knowledge of children's rights (Collins and Guevara 2014; UNICEF 2024), even if they are becoming more aware of human rights issues. This exacerbates the challenge identified by Zalnieriute and Milan (2019, p. 8) who observed, "Whereas governments are formally tasked with setting regulatory policies and human rights standards, in the digital environment the public sector often delegates this regulatory responsibility to private actors."

One element of the UN's operation is establishing tools for policy and practice in advancing human rights. This article examines the potential for the tech sector of one such tool, Child Rights Impact Assessment (CRIA). As will be explained, CRIA "consider(s) the impact on all children affected by the activities of a particular business or sector [... and] can also include assessment of the differential impact of measures on certain categories of children" (UN Committee on the Rights of the Child 1989, para. 80). In what follows, we first explain the UN's approach to applying human rights, and child rights, to businesses including the tech sector. We then show how the CRIA can provide a holistic yet practical policy tool for assessing the impacts on children's rights of developing and deploying digital technologies that harness businesses' prior familiarity with processes of impact assessment. Our research methods reveal, first, the extent to which CRIA is beginning to be used in the tech sector, as a result of two key drivers – regulation and advocacy. We draw on product developers' experiences to identify significant barriers to be overcome if CRIA is to help bring about a more child rights-respecting digital environment.

2 | Children's Rights: A Framework for Governing the Tech Sector's Impact on Children's Lives

The obligation on states to realize human rights is set out in the *Universal Declaration of Human Rights* but it is not always recognized that businesses, too, are "required to comply with all applicable laws and to respect human rights," including to undertake "human rights due diligence" as a means of assessing and accounting for their potential and actual impact on human rights. This is explained in the UN *Guiding Principles on Business and Human Rights* (UNGPs (UN 2011, p. 1; see also Kemp and Vanclay 2013), which also sets out the state's obligation to ensure that businesses meet these responsibilities. Addressing the tech sector, the UN Human Rights Office of the High Commissioner (2020, p. 1) has stressed that:

> *For entrepreneurs and executives in all parts of tech industry, the UNGPs provide a roadmap for operationalizing respect for human rights as part of how they do business, no matter the focus, size or complexity of the enterprise. The principles focus in equal measure on the imperative for States to adopt and enforce a smart-mix of rights-based public policy and legal measures to govern how new technologies are developed, deployed and used. And they provide guidance for what different actors need to do to deliver meaningful remedy to victims of business-related human rights harms.*

This framework is now being prioritized by states under the new UN *Global Digital Compact* (UN 2024). This has become the responsibility of the UN Office for Digital and Emerging Technologies (ODET), which officially succeeded the Office of the Secretary-General's Envoy on Technology on January 1, 2025. A critical challenge is to ensure that this authoritative framework is known and enacted by the tech sector, including in relation to children's rights. The barriers are many—lack of expertise in human rights, business models that prioritize profitability, and insufficient representation of diverse voices, notably children, in policy formation and decision making. Following lively advocacy (Livingstone and Sylwander 2024), the Global Digital Compact explicitly mentions children's rights, building on the earlier application of the UNGPs to children in the *Children's Rights and Business Principles* (UNICEF, UN Global Compact and Save the Children 2012). To clarify what this means for states and businesses, the treaty body for the UNCRC, the UN Committee on the Rights of the Child (2021), recently adopted its authoritative General comment No. 25. Concerned with the "provision, regulation, design, management and use of the digital environment" (para. 12), this sets out how children's rights can and should be realized in policy and practice and apportions responsibilities to all relevant duty bearers (Livingstone and Pothong 2023).

States' commitment to ratifying the UNCRC is to incorporate the provisions of the Convention and its general comments into national law and policy. While extremely patchy, references to children's rights are becoming more evident in tech policy and regulation. Notable instances include Europe's Digital Services Act (Lievens and Verdoodt 2021), the Australian government's Safety by Design Principles (Australian Office of the eSafety Commissioner 2019) and the African Union's Child Online Safety and Empowerment Policy (Ababa 2024), among others. Such developments are supported by national governments, supranational institutions, international organizations, academics and

design communities worldwide. Most important in driving implementation of the child rights framework in relation to policies, digital design, and safety assessment tools has been the work of UNICEF (2016a, 2016b, 2018, 2019, 2023, 2024), the UN's specialized agency specifically tasked with supporting implementation of the UNCRC. While UNICEF explicitly calls on the tech sector to respect children's rights (e.g. Dignum et al. 2021) and to take a child rights by design approach (Hartung 2020), other international organizations tend to select specific issues related to children's rights, for example, digital access (Broadband Commission 2023), equity and inclusion (Souter and Van der Spuy 2019), digital education and literacy (UNESCO, n.d.; World Bank n.d.) and online safety (ITU 2024; OECD 2021b, 2024a).

Relatedly, an expanding academic literature is applying child rights frameworks to evaluate diverse policies and products as they impact children's lives—for example, data protection (van der Hof et al. 2021), age assurance (Livingstone et al. 2024a), digital play (Grimes et al. 2024) and parental control tools (Stoilova et al. 2023). However, academic research also reveals the struggles and competing priorities that businesses face, for example, between safety and freedom of expression on a social media platform, or between user engagement and freedom from commercial exploitation (Pothong et al. 2024). The need for a practical tool for applying children's rights to product development emerges clearly from such research, as does the value of best practice case studies. The benefits of rights-respecting product design for children's digital lives are yet to be achieved at scale, along with benefits to the general population, since "making better, safer, less harmful tech requires design based on the lived realities of those who are most marginalized" and such "edge cases" can be "powerful indicators for understanding the flaws in our technologies" (Rigot 2022).

3 | The Origin and Applications of Child Rights Impact Assessment

The UNCRC requires states to "undertake all appropriate legislative, administrative, and other measures for the implementation of [children's] rights" (Article 4). In this context, CRIA is a key "tool for translating the Convention and its Article 3, on giving priority to the child's best interests, into practice in a concrete, structured manner" (Sylwander 2001, p. 20). CRIA has been defined as a "tool predicting the impact of any proposed law, policy or budgetary allocation, which affects children and the enjoyment of their rights" (FRA European Union Agency for Fundamental Rights 2014). Like other impact assessments, it can be deployed *ex-ante* to pinpoint "the future consequences of a current or proposed action" judged against tightly defined criteria (International Association for Impact Assessment 2009, p.1). It can also be conducted *retrospectively* (child rights impact evaluation) to assess the outcomes (Payne 2019; UNICEF Canada 2014).

To encourage "decision-makers to put a specific gaze on children and their rights and to identify any disproportionate impact on children" (Lundy 2020, p. 96), CRIA should be embedded in decision-making processes at all levels "as early as possible in the development of policy" (UN Committee on the Rights of the Child 2003, para. 45). Typically, CRIA follows an eight-step process: (1) screening to determine need, (2) scoping to identify aims, (3) gathering evidence, (4) consulting children, (5) assessing likely positive and negative impacts, (6) making recommendations, (7) publishing the results for scrutiny, and (8) continuous monitoring and evaluation (Payne 2020). These steps should be followed iteratively to facilitate learning and analysis of impacts on children's rights throughout the decision-making lifecycle (Götzmann 2019, p. 4).

Child rights impact assessment across a range of domains has been implemented internationally by UN agencies, especially UNICEF, and by governments in Europe, Australia, New Zealand, Canada, and recently, in some Global South countries—Bolivia, Colombia, Costa Rica, El Salvador, India, Malaysia, Rwanda, South Africa, and Tanzania. It has also been included in Human Rights Impact Assessments (HRIA) by governments in Ireland, Latvia, Luxembourg, the Netherlands, and Norway (Payne 2020). Research shows that implementation, crucially, is fostered through legislation (Byrne and Lundy 2019; Payne 2017). However, in most parts of the world, CRIA is not mandatory, undermining consistent benefits to children's lives. For example, the UK government committed to integrate the UNCRC, including CRIA, into its public decision-making processes (Payne 2017). However, it did not make this a statutory obligation despite the recommendation of the UN Committee on the Rights of the Child (2016).

The UNCRC requires not only that states should themselves embed CRIA into their policymaking but they "should also ensure that they monitor progress in the implementation of the Convention in business activities and operations ... [including] through the use of child rights impact assessments" (UN Committee on the Rights of the Child 2013, para. 77). Use of CRIA by businesses could productively align with established risk and impact assessment tools long used to optimize outcomes of policy and business decisions, as well as the more recent use of data protection impact assessments (DPIAs), following the General Data Protection Regulation (GDPR) in Europe. CRIA can also facilitate preventative action to mitigate harms that would be expensive, difficult, or problematic if only addressed after problems have occurred (OECD Organization for Economic Co-operation and Development 2014). In the fast-moving tech sector, related tools are now being introduced—for example, the requirement for Fundamental Rights Impact Assessment in the EU AI Act (Mantelero 2024). So, can CRIA be embedded in tech innovation to enable child rights-respecting outcomes and prevent rights violations?

Now that children's lives intersect substantially with online services and platforms, and with their communication, learning, health, social relations, and identities underpinned by digitally mediated activities and organizations, society is witnessing urgent calls for their rights to be respected, protected, and fulfilled in a digital world.

> *As this generation of children and young people becomes the first to truly live in the digital age, we are faced with the significant challenge of ensuring that their rights flourish in the online world. The protection of these rights*

> *must be successfully accomplished by being deeply embedded into the legal, government, business, education and social frameworks that govern and mediate our digital lives.*
>
> (ENOC European Network of Ombudspersons for Children (2019), p. 3)

Some of these calls include explicit mention of CRIA, recognizing the potential of an authoritative and tried-and-tested policy tool. Notable instances include 5Rights Foundation and End Violence Against Children's (2022) call for CRIA as part of their Child Online Safety Toolkit adopted by the African Union. Also, to implement its Recommendation of the Council of Ministers (CM/Rec(2018)7) on the rights of the child in the digital environment, the Council of Europe (2020, p.19) calls for use of CRIA by businesses "before their digital products or services could reach or affect children." The OECD (OECD 2021b, p. 10; see also OECD 2022) also calls for "regular impact assessments of laws and policies" in its "Recommendation of the Council on children in the digital environment." At the UN level, the Office of the High Commissioner and UNICEF recently called for CRIA as a means of implementing the UNGPs in the digital environment (B-Tech 2024), along with other forms of human rights due diligence. This builds on guidance in General comment No. 25 on the digital environment (UN Committee on the Rights of the Child 2021, para. 23) that:

> *States parties should review, adopt and update national legislation in line with international human rights standards, to ensure that the digital environment is compatible with the rights set out in the Convention and the Optional Protocols thereto. Legislation should remain relevant, in the context of technological advances and emerging practices. They should mandate the use of child rights impact assessments to embed children's rights into legislation, budgetary allocations and other administrative decisions relating to the digital environment and promote their use among public bodies and businesses relating to the digital environment.*

As the Committee further explains, businesses, too, should complete the full cycle of CRIA, applying it iteratively before and after (and ideally, during) decisions concerning the design, operation, and management of their online services and platforms (para. 38):

> *States parties should require the business sector to undertake child rights due diligence, in particular to carry out child rights impact assessments and disclose them to the public, with special consideration given to the differentiated and, at times, severe impacts of the digital environment on children. They should take appropriate steps to prevent, monitor, investigate and punish child rights abuses by businesses.*

In support of such calls, a range of organizations has produced CRIA toolkits for the tech sector – for example, the European Network of Ombudspersons for Children (ENOC 2020) and, most influentially, UNICEF (2016a, 2021, 2024), as discussed below. This article examines the extent to which businesses apply these tools and the impact of regulations and child rights advocacy on the consideration and integration of children's rights in the development and deployment of digital products and services used by children.

4 | Methods

To examine the potential and practice of using CRIA in the tech sector, we searched online and through expert consultation among our networks for all the available versions of this policy tool and to see how they have been used. Noting variations in terminology across domains, we identified multiple forms of impact assessments that address children's rights in relation to the digital environment, including human rights impact assessment (HRIA, World Bank 2013), risk impact assessment, wellbeing impact assessment, and so forth (Mukherjee et al. 2021). We also conducted secondary analysis of semi-structured interviews held with 19 digital developers, designers, and child rights experts during 2020–22 to explore the practical opportunities and barriers that arise regarding children's rights, including during CRIA. These interviews were part of two case studies to develop a design tool for rights-respecting digital play (Pothong et al. 2024) and a business toolkit for "child rights by design" (Livingstone and Pothong 2023). Interviewees were responsible for developing a range of products, including children's digital media, social media, games and safety platforms, and were based mainly in Europe, though some operated in Southeast Asia and the Middle East.

5 | Findings and Discussion

5.1 | The Impact of Regulations on Child Rights Impact Assessment in the Digital Environment

The role of the state is crucial in relation to children's rights as in other areas of digital policy. UNCRC (Article 4) obliges state parties to "undertake all appropriate legislative, administrative, and other measures for the implementation of the rights recognized in the present Convention." Formally, state parties are periodically held to account by the Committee on the Rights of the Child for their compliance with children's rights, and references to the digital environment in these proceedings are growing (Livingstone et al. 2024c). Our desk research found that states are responding in diverse and at-times contested ways, implementing a range of national and regional regulations to promote digital access, education, cybersecurity, data protection and online safety (Pothong and Livingstone 2025). Some of these regulations, namely data protection and online safety, place requirements on businesses in scope to conduct risk or impact assessments, thereby addressing some of children's rights. Subsequently, a small number of businesses have begun experimenting with CRIA, as will be discussed below. However, the effectiveness of regulatory enforcement regarding child rights in the digital environment varies hugely.

Perhaps surprisingly, data protection regulation has led the way for states to promote child rights in business practices in the tech sector. This likely results from widespread acceptance of Data Protection Impact Assessment (DPIA) following the EU GDPR (ITU 2023). Also important has been the growing popularity of Age Appropriate Design Codes around the world as a means of protecting children's data privacy and, thereby, their online safety (5Rights Foundation 2022). These were initiated by the UK's Data Protection Act 2018, which references children's rights in the first standard of its mandatory *Age Appropriate Design Code* ("The best interests of the child should be a primary consideration when you design and develop online services likely to be accessed by a child"). To ensure compliance, the UK regulator requires providers in scope to conduct DPIA to "assess and mitigate risks to the rights and freedoms of children who are likely to access [the] service, which arise from … data processing" (ICO Information Commissioner's Office 2020, p. 7). The Irish Information Commissioner followed the UK's lead, explicitly citing the UNCRC in stating that, "as part of a child-oriented DPIA, organizations should consider conducting CRIA" because "doing a comprehensive CRIA represents a powerful tool for assisting an organization in demonstrating its compliance with its Article 24 and 25 GDPR obligations in respect of processing children's data" (Data Protection Commission 2021, p. 62). While seemingly restricted to the specific right of privacy, reference to the best interests of the child and to CRIA widens the scope to include all children's rights (Livingstone et al. 2024b).

The UK Online Safety Act, the EU Digital Services Act, the Corporate Sustainability Reporting Directive, and the EU GDPR all require businesses to anticipate, address and remedy the risks that their digital products and services pose to children and their rights (UNICEF 2024). For example, the Dutch government has called for CRIA when endorsing their *Code voor Kinderrechten* (*Code for Children's Rights*) and calls for a "child impact assessment" as a means to "make the best interests of the child the primary consideration" (Principle 1) in the design of online services and platforms as well as "a privacy impact assessment based on children's rights" (Principle 5) (van der Hof et al. 2021). In another example, the Youth Protection Act in Germany was amended in 2021, establishing a mandatory framework for precautionary measures, requiring, for example, online service providers to anticipate and mitigate "interaction risks," such as in-game communication and in-app purchases (TaylorWessing 2022), similar to those in CRIA. Whether other governments will follow suit remains to be seen. Possibly, attention to the digital environment will increasingly be incorporated into wider child rights-related policymaking. For instance, during the COVID-19 pandemic, the Scottish government conducted several rights and wellbeing impact assessments that included attention to digital exclusion and its consequences for children's health, play, and education, especially for marginalized and disadvantaged groups (Tisdall and Morrison 2022).

Our desk research identified two cases of businesses experimenting with CRIA as a result of state regulation. Wikimedia (2023) published its CRIA following its classification by the EU's DSA as a "Very Large Online Platform." Possibly also in response to the DSA, the live-streaming service Twitch (2023) published its HRIA, including a detailed account of the 18 recommendations it committed to addressing as a result (BSR 2023). Notably, this acknowledged that children use the platform underage and hence merit due diligence and access to remedy. However, this took place just before the company made major redundancies (Parrish and Peters 2024). These two examples of CRIA are the only ones we found, though it is a problem that CRIA is not always made public, despite this being one of the necessary steps in the process. During 2022, one of the authors was invited as an independent (unpaid) expert to participate in internal CRIAs undertaken by Google LLC and BT Group plc (formerly British Telecom). In a further instance, we participated in a European Commission-funded research project to bring a child rights lens and the insights of CRIA to the age assurance industry as it responds to the DSA (Livingstone et al. 2024a). This hints that CRIA may be more widespread than generally known, being used as a policy tool to ready businesses for regulation in the digital environment. However, unless these are published, it is near-impossible to conduct an independent evaluation of any benefits to children's lives.

5.2 | The Impact of Advocacy on Child Rights Impact Assessment in the Digital Environment

When protecting children's rights is left up to digital businesses, advocacy can be powerful in encouraging implementation. UNICEF (2024) has led in advocacy for CRIA through partnerships with both governments and businesses, and by developing guidance, toolkits, and good practice case studies. Their efforts are deliberately designed to benefit children around the world, recognizing the growing importance of digital technologies in children's lives everywhere, and intending to support states and businesses even in the absence of rights-respecting legislation. Early examples of their CRIA toolkits for use by digital businesses include the *Child Online Safety Assessment (COSA) tool*, co-developed by UNICEF and the LEGO Group (UNICEF 2016b) and the *Guide to Using the Child Rights Impact Self-Assessment Tool for Mobile Operators* (MO-CRIA), co-developed with mobile operator Millicom (n.d.) in 2016, and later updated by UNICEF in 2021, as part of UNICEF's broader tools for ICT companies (UNICEF 2016c, 2021).

Our desk research found that these toolkits and guidelines for CRIA have been implemented by multiple companies, including Digi (Telenor) across Asia (UNICEF 2021) and Tele2 (2024). Millicom (n.d.) reported that it "has applied the Children's Rights Assessment Tool in Bolivia, Colombia, El Salvador, Rwanda and Tanzania, and plans to deploy it in other countries where it operates." Verizon (2022) recently reported on its "holistic Child Rights Impact Assessment (CRIA) with the objective of informing and supporting its work in identifying, preventing and/or mitigating risks to child rights across its business operations" (see also Global Child Forum's (2021) case study of Vodafone). This identified priority child rights issues for the company to address, encompassing digital inclusion, safety, and privacy, as well as 10 recommendations for improvement, each of which Verizon publicly responded to with actions taken.

The actions of telecoms and mobile companies appear particularly promising in relation to child rights. However, it should be noted that these companies are not subject to the degree of political critique or public concern that increasingly centers on social media platforms. Indeed, it may even be argued that it serves these companies' interests to demonstrate compliance with child rights requirements precisely to avoid the attention of regulators. While UNICEF's partnerships with telecommunications companies are widely cited as good practice, they have not yet succeeded in such partnerships with social media or gaming or other platforms. Separately, Meta has reported to the Office of the High Commissioner for Human Rights (Davis 2022) that it conducts thorough HRIA. The effectiveness of its approach, particularly in prioritizing human rights over corporate profit, is strongly disputed by human rights advocates (Okkonen and Oribhabor 2022). In Meta's Best Interests of the Child Framework (Montgomery and Koros 2022), which heavily cites the UNCRC, it has rebranded its child safety and parental control tools as rights-respecting, including claiming to "Prioritize youth well-being and safety over business goals and interests," a key demand of UN General comment No. 25. In practice, Meta's design interventions fall short of this claim, for they comprise mainly setting to private the profile of users under 16, introducing a "take a break" feature, and preventing unknown adults messaging teens directly (Livingstone et al. 2024b). These may marginally reduce company profits, but many other changes to Meta's service called for by children's advocates have not been made (Wood 2024).

A recent landscape review by UNICEF (2025) regarding industry reporting on CRIA found that only a minority of corporate reports disclosed meaningful information about corporate impacts on children's rights, although almost one third (30% of the 195 reports published between 2022 and 2024) addressed child rights in relation to the digital environment in some way. This was usually concentrated selectively on online safety and privacy issues rather than holistically assessing the full range of their rights, as required by CRIA. Indeed, little independent evidence demonstrates benefits to children's positive rights, notwithstanding businesses' promotional claims. Further, while some elements of CRIA can be discerned, crucial elements are often missing, notably transparency regarding evidence and risk assessment, procedures for weighing alternative interventions against the rights at issue and agreed processes for evaluating and publishing the results.

Table 1 summarizes how far published information from companies that have undertaken a CRIA shows that the tech sector has followed the required eight steps. This suggests that companies are more willing to undertake screening and scoping tasks, along with assessing the impacts of their work for child rights and, for the most part, drawing out recommendations. For example, a typical methodology statement from Tele2 (2024) states that its CRIA

> *was based on a comprehensive assessment of Tele2's current policies, processes, and operations related to children's rights, benchmarking against industry peers, desktop research and industry analysis on children's rights and the ICT-sector, and stakeholder dialogues with*

TABLE 1 | Extent to which digital companies follow the CRIA process.

Company	Has followed the main steps of the CRIA process?							
	1. Screening for need	2. Scoping for aims	3. Gather evidence	4. Consult children	5. Assess impacts	6. Recommendations	7. Publish results	8. Monitor, evaluate
Digi (Telenor) (UNICEF 2021)	Yes	Yes	Unknown	Unknown	Yes	Unknown	No	Unknown
Millicom (n.d.)	Yes	Yes	Yes	No	Yes	Yes	Yes, some detail	Some
Tele2 (2004)	Yes	Yes	No	No	Yes	Yes, brief	Summary	Unknown
Twitch (BSR 2023) (NB HRIA)	Yes	Yes	No	No	Yes	Yes	Full report	Unknown
Verizon (2022)	Yes	Yes	No	No	Unknown	Yes	Summary	Unknown
Vodafone (Global Child Forum 2021)	Yes	Unknown	No	No	Unknown	No	No	Unknown
Wikimedia (2023)	Yes	Yes	No	No	Yes	Yes	Summary	Some

Note: We have identified which steps were followed, where feasible, based on information contained in the published reports.

internal and external stakeholders including key company functions at Tele2 and external child rights organisations.

(p.3)

Less common, and seemingly challenging, is gathering evidence and, especially, consulting children, itself at the heart of a child rights approach. Publication of the results varies considerably, from a 71-page report by Twitch to the more common short report, sometimes containing valuable detail but often so short and generic as to make it hard even to know what has been done or found. Businesses' sustained actions to monitor operational processes and evaluate the implementation of recommendations are largely unknown.

5.3 | Providing Value for Children in Design Promotes Children's Rights

Despite the lack of comprehensiveness and transparency regarding the conduct of CRIAs, our codesign workshops to develop tools for businesses to integrate children's rights into their product development (Livingstone and Pothong 2023; Pothong and Livingstone 2025) show that those businesses providing for children are already attuned to child development theories and children's diverse requirements. Further, their concern with children's development and understanding of their needs appears to make these businesses more sensitive to children's rights. For example, a small business developing an education game for children reported intentionally designing in "a cut-off point" to limit (rather than maximize) children's daily engagement. This company could afford to recognize children's right to protection from commercial exploitation (van der Hof et al. 2022) because it has charitable funding rather than relying on attention-based advertising.

Another start-up reported prioritizing inclusivity and equity in their design to encourage children, particularly girls, to learn to code. This involved rethinking how users engage with the game, and by addressing representation in the game—"we keep all our characters quite diverse," and they made the main characters girls "on purpose." As a final example, a large company told us how their product design seeks to balance "the commercial aspect of it" in relation to their "addressable audience" and "what is safe ... what allows freedom with kids." All three companies worked closely with children throughout their iterative design process to incorporate their feedback and experiences, which is important in CRIA, in effect embedding the child's right to be heard (UNCRC, Article 12) into design practice. However, their rationale referred to the value of gaining an understanding of child development, rather than a determination to enable children's voice and agency as part of a commitment to their rights.

5.4 | Barriers to Child Rights Impact Assessments in the Digital Environment

Notwithstanding some positive efforts and promising case studies, our desk research and interviews with developers of digital products showed that implementing child rights into practice is likely to be an uphill battle. This is despite the availability of tools and guidelines (BSR 2023) along with rising public calls for both states and businesses to provide "children with the opportunity to benefit from engaging with the digital environment and ensuring their safe access to it" (UN Committee on the Rights of the Child 2021, para. 24). However, the usually nonbinding status of CRIA undermines business efforts to apply it or even to consider business impacts on children's rights at all. Our interviews with businesses, especially start-ups, indicate that children's rights are, at best, an afterthought in businesses' innovation process, if they are considered at all. More commonly, attention to children's needs is deferred until after the functionalities of the product or service are already designed and developed, investment obtained, and operation in the market already established:

When you talk about UX design and you talk about the developers, these are guys who I know who sit in Silicon Valley who are incentivized to do anything they can to build these dopamine hits. And they don't care about the impact of what this does on children, what this does on anyone.

(Start-up, developing a user-generated, content-sharing app)

The main companies that are controlling kids' media today are American, it's all profit... So, I think the regulatory framework is critical ... but I feel like that is a huge challenge because what most companies I've worked with did to avoid that was just say, we're not designing for children... [Yet their market] globally impacts children all over the world.

(Independent UX researcher, specializing in interactive environments for children)

Although some do make efforts to embed children's rights into their online services and platforms, including by drawing on valuable toolkits and resources from child rights and design communities (D4CR Association 2020; European Commission 2024), such efforts remain the minority:

The ideal is, of course, those who think about child's rights in terms of, let's go read the design guidelines. They're intrinsically motivated designers who want to make a difference... But they are the minority, right? So, the majority just do what they need to do, and those leading companies usually have other interests in mind, and they will go by regulations.

(Independent UX researcher, specializing in interactive environments for children)

Recently I started working for a start-up... I was hoping to be able to make some change [... but] we couldn't really tell the big group behind this idea to maybe do that a different way... We've got constraints as a freelancer or as a small start-up to just make a living.

(Freelance digital product designer)

Many companies struggle even to prioritize children's safety from age-inappropriate content or contact risks in the face of pressure from investors to maximize profitability. While larger companies may make grand claims about "doing the right thing," possibly confident that public scrutiny of their internal operations is near-impossible, start-ups and independent designers are franker. The developer of a user-generated, content-sharing app explains how, in the product version already in the market, no protections were implemented:

> *Because the assumption is we're just testing with friends and family. But eventually, we want to have the controls be much stronger... As of now, if paedophile Joe wants to join [this group], he can invite all of his friends, and they could be naked.*

Our questions about children's safety, privacy and other rights were barely on the radar of those we were interviewing, and neither did they know where to find practical resources. Even when they showed some awareness of child rights, we observed a tendency to borrow from already-developed solutions rather than think afresh about children's needs or possible unintended contexts of use, potentially perpetuating inadequate approaches simply because others had already deployed them:

> *In the early stages, we're currently not doing any verification but in the later stages ... we'll use the verification that are currently used in Tinder and Bumble to verify profiles.*
>
> (Start-up, developing a social app)

While business pressures are real, and legislation could help prioritize child rights in relation to online service and platform development, the very process of CRIA can represent a barrier to implementation. Being an iterative process, involving various steps as described above in the section on its origin and application, CRIA "can be overly bureaucratic, too often regarded as an additional burden on busy officials and in effect used to justify decisions that have already been made" (Payne 2017, p. 11). Interviewees' descriptions of their development processes, excerpted here, also suggested that the traditional CRIA process (Payne 2020) does not translate well into practical design considerations and processes. Indeed, we discerned in our interviews with businesses a lack of familiarity with, even anxiety regarding, some of the elements involved in CRIA—notably, tasking design teams with child rights considerations, consulting children as part of product development, anticipating what could go wrong, especially for unintended audiences, identifying impacts specific to disadvantaged or marginalized groups of children, and publishing their approach to assessing child rights impacts.

While CRIA can be demanding and resource-intensive, in relation to the digital world, particular and new challenges arise both for policy and practice (UNICEF Canada 2014). It demands an "inter-balancing of different rights" (interview with a child rights expert), which, at times and in certain contexts, may seem to compete. For example, managing harms associated with social media use requires attention to children's rights to protection and expression. Promoting some rights—consider the rapid deployment of digital technologies during the Covid-19 pandemic for remote learning—can seem to pit the right to education against children's right to privacy because of technologies of surveillance, proctoring, and profiling.

Legislation is helping to compel some businesses to take steps towards implementing child rights in their development processes. But, as we have seen, this is largely concentrated on the protection of privacy, safety and security, rather than a holistic approach to children's rights, including, notably, their civil rights and freedoms. It seems that, in the absence of an explicit child rights approach, policy actors and developers in the tech sector across state, civil society and businesses find it hard to recognize the full range of children's rights, let alone attain the expertise to respect them or the ambition to support them especially if such actions are seen to reduce profitability.

Moreover, providers of digital products and services have long resisted expectations that they should provide for the needs of children or other vulnerable groups on the grounds that they could not identify the age of their users nor the circumstances of their lives (Lenhart and Owens 2021; Livingstone et al. 2015). However, pervasive data collection that harvests multiple aspects of users' interaction with online services (5Rights Foundation 2021), combined with increasingly powerful computing techniques, is radically changing organizations' actual and potential knowledge of their users. Rights advocates are pressing businesses for their data and related insights to ensure they realize rights, while researchers are revealing how such insights are typically used instead to maximize revenue through optimizing user attention, monetizing data and targeting advertising (e.g., Lenhart and Owens 2021; Radesky et al. 2020; Zalnieriute and Milan 2019). Arguably, the time is right for child rights impact assessment in a digital world, and the more that states and businesses integrate online services into their operation, the more urgent this becomes.

6 | Conclusion: Accountability for Children in a Digital World

Children's physical and digital lives are increasingly intertwined. With ever greater societal reliance on online services and platforms, most of which are designed for generic adult users, policy tools are urgently needed to address the needs and rights of children. This article has argued that the policy tool, child rights impact assessment—CRIA—can provide part of the answer. Although children's rights are unfamiliar to many policymakers, designers, and developers in the tech sector, the role of impact or risk assessment is widely recognized, and related tools such as DPIA and HRIA are gaining attention. This article has demonstrated through desk research on recent deployment of CRIA by the tech sector, combined with interviews with product designers and developers, that, in different ways, both regulation and advocacy have, albeit very modestly, facilitated consideration of children's rights on businesses' agendas. Our interviews showed that the majority of businesses are still under commercial pressure to cover their operational

costs and derive profits. However, findings from our codesign workshops show that there is a glimmer of hope among businesses that cater to children to generate positive examples of organic design for children's rights. Specifically, we have identified good practices emerging in response to safety and data protection regulation led by governments, though less so in relation to other child rights. We have also identified good practice by telecommunications and mobile operators following child rights advocacy, including through advertiser and investor pressures (Investor Alliance for Human Rights 2024), though much less in relation to other digital products and services (BSR 2025; UNICEF 2024).

However, although we have argued that CRIA can be a helpful policy tool that makes children's rights, developmental needs and diverse circumstances more visible and their voices better heard, we have also shown that it is not easy to implement. Particular barriers in the tech sector arise from the pace of innovation, the pressures on profitability, and low awareness of child rights issues. Further barriers include the lack of established mechanisms for embedding and balancing protection (e.g., safety and privacy) with children's other rights in digital design and product development. To overcome practical barriers to the inclusion of CRIA in businesses' human rights due diligence practices, governments, regulators, and legislators could devise a "Smart Mix" of mandatory and voluntary mechanisms (B-Tech 2024) to motivate businesses' use of CRIA and the implementation of child rights by design. However, independent evaluation of the effectiveness of CRIA is scarce in those instances where it has already been implemented, lacking transparency in its process end-to-end, and hence leaving uncertain its potential for improving children's digital lives.

If children's rights are to be realized in a digital world, further advances will require both concerted efforts from states, civil society, and international organizations, and greater availability of and familiarity with practical tools and guidance to embed CRIA and other child rights mechanisms into the design of the digital environment. With this in mind, we have developed a toolkit (Livingstone and Pothong 2023) that maps CRIA onto the digital design process to help providers integrate children's rights into their online services and platforms—child rights by design. Future research should compare, evaluate, and debate the effectiveness or otherwise of the growing range of cases using CRIA across the digital environment.

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