

Enabling Rights



GeSI ENABLING
DIGITAL
SUSTAINABILITY

**The Transformative Potential of Digital
to Enable People's Rights.**



#EnablingRights



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The opinions expressed in this report are that of GeSI alone.

I. Foreword

To date, conversations about the Digital Industry's impact on human rights have focused on its business practices (i.e. adopting policies consistent with human rights standards and stakeholders expectations) and relationships (i.e. encouraging entities it interacts with to adopt such policies). Across these two, interconnected pillars, the industry has been asked to address salient issues such as privacy and freedom of expression, data and cyber security, labor rights in the supply chain, the misuse of technology by customers and contractors, and the dual-sided nature of technology in which digital technology has the potential to be used for good or ill-intent. A wide number of initiatives and partnerships already exist on these two "pillars" of action.

We believe now is the right time to add to this conversation a third, interconnected pillar: **the potential of Information Communication Technology (ICT) to support the efforts of those working to protect human rights.**

Following a participative consultation process with civil society and interested stakeholders, the **Global Enabling Sustainability Initiative (GeSI)** is pleased to release this report addressing the application of innovative digital technology to support human rights.

The report suggests that the ICT industry, in collaboration with all interested stakeholders, should take action to develop and apply what could be called "**technology for human rights.**" This can be defined as the application of new or existing digital solutions used for the express purpose of supporting civil-political, socio-economic, and developmental rights.

The report highlights examples of how ICT solutions are being applied constructively to help address and arrest human rights abuses. Yet, the human rights benefits of digital solutions such as blockchain for responsible supply chain practices; GPS and data analytics to protect land rights; or civic tech allowing greater citizen scrutiny of public spending, remains untapped. The ICT industry has the capability to scale up technology solutions supporting a wide range of needs that human rights defenders have.

For the ICT industry, the report also defines a clear business case to help develop and apply technology solutions for human rights. The core elements of the business case include the ability of technology for human rights to:

1. Help **address competitive risks** that affect an entire industry or geographic market;
2. Support **long-term commercial growth**;
3. Enhance **revenue**;
4. Support a **company's approach to sustainability and corporate responsibility** both in terms of **risk reduction and revenue generation**;
5. Help to ensure an environment of **trust and responsibility**.

For technology to reach its potential to enable human rights, the ICT industry will need to collaborate with a broad range of stakeholders to address key challenges that pose risks to the effective deployment of digital solutions for human rights. To that end, GeSI proposes to create a **Technology for Human Rights Innovators' Network to Use ICT to Enable Human Rights** ("Innovators' Network"). The **mission** of the Innovators' Network will be to coordinate the collective capabilities of ICT industry leaders, human rights organisations, policy makers, academia, and social innovators, to accelerate and scale-up the development and application of technology that enables human rights.

At the time of publication of this report, both the promise and concern of the industry are in the public's eye. Companies have been called to testify about their practices associated with the protection of customer data. Debates are underway regarding whether artificial intelligence (AI) and machine learning will bring in a new era of economic and human development, or whether they will threaten livelihoods and well-being. Europe has launched a major regulatory framework, the General Data Protection Regulation (GDPR), focused on data privacy and security. These events raise the following question: can technology help protect individual freedom, or will it be used by those with bad intentions to take freedoms away?

No easy answers exist. The first step involves building understanding of the role that digital solutions can play in enabling and promoting individuals' rights; the second step involves identifying the existing challenges and discussing issues. The third step, and our ultimate goal, means partnering with a variety of stakeholders to provide leadership, make the right choices, and take corrective action collaboratively on developing and applying technologies designed to enable and promote the rights of individuals everywhere.

The Innovators' Network is intended to create a long term, open and transparent dialogue with key stakeholders to advance ways to build trust in the responsible practices of the ICT industry. As human rights defenders become aware and engaged in the industry's efforts, pathways should open for collaboration to enhance the industry's responsible business practices, business relationships, and efforts to advance technology for human rights.

Enhancing human rights is a continuous process. Technology, while not a panacea, has an important, enabling role to play. This report illustrates some ways in which the ICT industry can support this process. GeSI looks forward to working with all those serious in collaborating to advance technology for human rights.



Jim Gowen, GeSI Chairman

Vice President, Supply Chain Operations and Chief Sustainability Officer, Verizon

II. Executive Summary

This report identifies the potential of information and communication technologies (ICT, also referred to as “digital solutions”) to support the efforts of those working to protect human rights such as NGOs, law enforcement, grant-makers, activists, social entrepreneurs, social innovators, government agencies, companies, communities, and individuals themselves. This report is meant for all audiences with an interest in protecting human rights. It is directed particularly to leaders in the ICT industry itself and those working to defend human rights.

First and foremost, the ICT industry has an obligation to respect human rights and address negative impacts it may cause. As a representative of many leading companies in the ICT industry, the Global e-Sustainability Initiative (GeSI) has a mission to drive the global transformation to a smarter, more sustainable world with digital solutions at its core. A core focus of GeSI’s work is to develop the frameworks, tools, policies, and processes to help enable the global ICT industry to embed considerations of human rights as part of core, responsible business practices.

In addition to this responsibility, there is a growing need to take greater action to develop and apply what could be called “technology for human rights.” This can be defined as the application of new or existing digital solutions used for the express purpose of either mitigating harms to human rights or enhancing the protection of human rights. In particular, technology for human rights can be particularly helpful for:

- Identifying and documenting human rights violations;
- Supporting efforts to stop human rights violations;
- Supporting efforts to anticipate and prevent human rights abuses/violations from occurring
- Helping to bring human rights violators to justice;
- Enhancing safety and security that protects the rights of individuals and those working to defend human rights;
- Enhancing the skills and capabilities of individuals to enhance their economic and political rights (such as gaining access to education and health).

Digital solutions can be applied constructively to help address and arrest human rights abuses. Yet, the potential role of the ICT Industry could be greatly enhanced. It has the capability to scale up solutions as a vital partner. Human rights champions and defenders have a range of specific technology needs that the industry could potentially support such as:

- Civic Tech: this refers to digital solutions that help citizens hold public officials to account;
- Data analysis and visualization to identify and forecast human rights violations;
- Human rights data collection and management;
- Human rights data security to ensure the privacy of information collected, shared, and used by defenders of human rights;
- Engaging digital and high-speed communication networks for human rights;
- Applying fintech to support human rights (such as ensuring that aid funds reach intended beneficiaries);
- Applying digital technology to support the efforts of the legal system to prosecute successfully those that perpetrate human rights abuses, and to monitor those that threaten to violate human rights (often summarized as “human rights forensics and monitoring”).

These kinds of technologies can be applied to help support a variety of human rights issues such as:

- Enabling Access to Resources Essential for Development;
- Protecting Child Safety Online;
- Preventing Human Trafficking;
- Preventing Injustice and Corruption;
- Supporting Labor Rights and Responsible Supply Chain Practices;
- Protecting Land rights and Identity;
- Protecting Privacy and Freedom of Expression;
- Protecting Safety and Security;
- Strengthening the Rights of Citizenship.

The report shares a variety of examples demonstrating the application of digital solutions to support these issues.

For the ICT industry, the Report defines a clear business case to help develop and apply digital solutions for human rights. The core elements of the business case include the ability of technology for human rights to:

1. Help **address risks that affect the financial competitiveness of the ICT industry**. These are risks that affect an entire industry or geographic market. Human rights have the potential to pose a systemic risk for the ICT industry because the root of the industry's business model is intertwined with the fundamental laws and regulations that support the protection and provision of rights. Systemic risks are hard to quantify in part because they are so vast. Yet, in 2015 research into government-led internet shutdowns that had the consequence of constraining the rights of individuals cost countries USD \$2.4 billion. This estimate did not attempt to calculate the full costs to the ICT industry which might increase this figure substantially.
2. Develop **long-term commercial growth opportunities**. As many as 1.1 billion people live in areas with little or no communications coverage.¹ The ICT industry has long been aware that as more individuals become connected, industry earnings increase. Studies find that a 10% increase in mobile broadband adoption leads to a 0.6–2.8% increase in economic growth,² while a 10% increase in fixed broadband adoption increases GDP 1.35% in developing countries and 1.19% for developed countries.³ As individuals gain access whole economies and the ICT industry will benefit.
3. Develop **immediate revenue opportunities**. GeSI finds that the SDGs will create a USD \$2.1 trillion market opportunity created for the ICT industry, *a 60% increase compared to current ICT-sector revenues*.⁴ In addition, upwards of 4 billion of people may be “rights-constrained.” A number of the examples shared in this Report come from businesses who intend to use the commercial marketplace as the best vehicle to drive uptake of technology for human rights through “win-win” or “shared-value” approaches.
4. Support a **company's approach to sustainability and corporate responsibility both in terms of risk reduction and opportunity creation**. Emerging evidence finds that the kinds of investments that a company would make to support human rights and responsible business practices have great potential to enhance enterprise value across a number of key performance indicators (KPIs) such as increasing share price by up to 6%; increasing sales by up to 20%; reducing employee turnover by 50%; and increasing productivity by 13% to name a few.⁵

¹ https://www.technologyreview.com/s/609009/the-unfinished-work-of-vanu-bose/?utm_term=o_g997ed6f472-27fbffcf1-156370649&utm_content=buffer8fa2d&utm_medium=social&utm_source=facebook.com&utm_campaign=buffer

² Edquist, Harald, “New report proves mobile broadband drives global economic development” Ericsson, 14 September, 2017. https://www.ericsson.com/thecompany/sustainability_corporateresponsibility/technology-for-good-blog/2017/09/14/4524/

³ West, Darrell, “Internet shutdowns cost countries \$2.4 billion last year,” Center for Technology Innovation at Brookings, October, 2016. P 1.

⁴ GeSI, “System Transformation: How Digital Solutions will Drive Progress to the Sustainable Development Goals.” 2016. www.systemtransformation.gesi.org. P. 3.

⁵ Steve Rochlin, Richard Bliss, Stephen Jordan, and Cheryl Kiser, “Project ROI: Defining the Competitive and Financial Advantages of Corporate Responsibility and Sustainability.” 2015: IO Sustainability.

For technology for human rights to reach its potential, the ICT industry, human rights defenders and supportive stakeholders will need to collaborate to address key challenges that pose risks to the effective deployment of digital solutions, such as the vital need:

- To understand the double-sided nature of technology. The same instruments can support human rights or violate them, depending on the way users apply them;
- For vigilance by leaders across business and civil society to ensure that technology is used responsibly and in ways that help support human rights;
- For collaboration across the private, public, and civil sectors;
- To understand that technology for human rights is not a panacea. It has the potential to be a powerful enabler of human rights but not a determinant by itself.

The report discusses the key trends that will either support or inhibit the progress of technology for human rights. As a next step, this report calls for a partnership to advance technology for human rights that would focus on the following:

1. Sparking innovation and R&D into technology for human rights.
2. Measuring and evaluating the most effective solutions and disseminating lessons learned.
3. Scaling-up the adoption of effective technology for human rights.
4. Creating safeguards that ensure that human rights defenders are protected and cannot be compromised by the use of technology for human rights.
5. Advancing policies that support the widespread dissemination and use and technology for human rights around the world.
6. Enabling effective partnerships across business, human rights defenders, and individuals.
7. Supporting the efforts of the ICT industry to build trust regarding its own responsible behaviors.

The diffusion and improvement of human rights is a continuous process. This report illustrates some ways that the ICT industry can support this process. GeSI remains open to engage in dialogue with all those serious in collaborating with the ICT industry.



III. Understanding the Potential of Information and Communications Technology for Human Rights

"Technology is crucial in empowering people to participate in our digital future, and in helping governments to better serve people. But we must also address significant concerns such as cybersecurity, human rights, privacy, as well as the digital divide, including its gender dimensions. Broadband is a remarkable tool; now we must do more to ensure that all enjoy its benefits."

António Guterres, United Nations Secretary-General⁶

"There exist tremendous opportunities to advance human rights efforts with the aid of a myriad of technology tools [...]. There is a sense of urgency to enhance the capacity of the human rights movement to monitor and hold to account abusers who violate rights in the physical world and online. This entails use of technology to monitor and build evidence of abuses, as well as promoting policies for technical infrastructure that protects basic rights."⁷

The scenario has become too familiar: a country falls into conflict and sectarian violence. A vulnerable segment of the population suffers from horrific acts leading to imprisonment, displacement, and even death. Families and whole communities flee the country as refugees.

While not a panacea, recent examples have begun to show the potential of a new set of tools to help mitigate, and in some instances potentially prevent the worst consequences of this scenario. It is becoming possible to imagine that those that would stand up to these heinous crimes have a set of tools at their disposal. Analytic software, powered by machine learning (or more commonly known as artificial intelligence), may be able to predict the escalating conflict by synthesizing data from real-time, high-resolution satellite imagery, trend analysis from community commentary made on social media and digital networks, video livestreamed and shared on the internet, and movement patterns detected by an infrastructure of smart sensors, connected devices, and high speed communication networks. This would enable warnings to go out before the conflict escalates, potentially saving the lives of hundreds of thousands.

For those that tragically lose their lives, we can now imagine that their family, friends, and neighbors are able to securely send encrypted statements to journalists and human rights defenders. Using digital technology, the global community will have a growing mountain of evidence regarding the perpetrators' crimes. Human rights defenders will have more resources to take action to bring perpetrators to justice.

Last but not least, as potentially millions enter into refugee status, host countries with the support of global humanitarian workers and concerned corporate citizens will be able to use technology to mobilize a response. Digital solutions will be able to provide refugees without a home, savings, or vital records with virtual identification verified by connected devices that link into relief agencies, UN organizations, government service agencies, and financial aid institutions. Via a smart phone, the refugees will be able to receive direct aid transfers dodging the corrupt hands of opportunists, tracked and verified by blockchain. Secure, encrypted networks will enable refugees to communicate their urgent needs. The global relief community will be able to pinpoint needs and coordinate information across government agencies and relief organizations. An information management system will have the potential to enable collaboration across disparate aid organizations to provide on-demand shelter, food, health services, and pathways to citizenship and employment. Families living in refugee camps will be able to access high quality medical care through virtual clinics providing a mix of telemedicine with hands-on care. Digital networks will be able to provide virtual, high quality education for children, and job training programs for adults.

⁶ Johnson, Heather, "Making it real – ICT and the SDGs," Ericsson, 18 September, 2017. https://www.ericsson.com/thecompany/sustainability_corporateresponsibility/technology-for-good-blog/2017/09/18/making-it-real-ict-and-the-sdgs/

⁷ Guberek, Tamy, and Silva, Romesh, "Human Rights and Technology: Mapping the Landscape to Support Grantmaking," PRIMA and the Ford Foundation, August 2014. P 1

This scenario – where information and communications technology (ICT) helps mitigate a humanitarian catastrophe, brings perpetrators to justice, and enables survivors to return to a secure and productive life – is already being tested. Several of the capabilities the scenario describes exist and are being used, or piloted, today. It's not hard to envision scenarios where ICT enables citizens not just to predict a crisis but to defend themselves from dictators and others that would violate and abuse their rights.

This is the potential, but it is not guaranteed. The same technologies that could protect and remedy human rights abuses might be used to undermine them. A lack of awareness, understanding, and resources may inhibit the ability of human rights defenders to adequately utilize ICT to support human rights. Likewise, a lack of familiarity of, or strong connections between, the ICT industry and human rights defenders may limit the collaboration and partnership necessary to bring the potential use of ICT for human rights to scale.

This time in history marks only the early stages of realizing the tremendous potential the ICT industry has to serve as a vital partner in the effort to protect, respect, and remedy human rights abuses.

*"Technologies such as mobile phones, social media and remote sensing are increasingly used to capture information about abuses. Software and hardware can help long-term data preservation and archiving. Applications for analyzing, visualizing and presenting information enable more compelling empirical evidence. Mass communications technologies are now central to advocacy, mobilization, and knowledge-sharing. Indeed, throughout all aspect of human rights work technologies amplify the efforts and capacities of practitioners."*⁸

Recognizing this potential is not meant to minimize the responsibility of the ICT industry to ensure that its decisions, behaviors, operations, and products do not themselves harm the rights of individuals across its value chain, customer base, and communities. On-going dialogues regarding the commitments the ICT industry should make to prevent and if necessary remedy human rights violations it may be involved in causing are important, yet only part of the equation. Part of the responsibility of business is to consider its positive impact on human rights from business operations. For example, the company Oath⁹, recently acquired by Verizon, states that its human rights responsibility entails both identifying and mitigating risk to human rights as part of its business operations, as well as increasing the ability of its products, services and platforms to support human rights. Overlooking the enabling potential of ICT denies human rights defenders significant resources, capabilities, and solutions. These same capabilities could transform the well-being of billions of individuals whose rights are constrained and threatened. Research by the World Bank finds that generally, technology for human rights-related platforms built by ICT industry service providers, "[T]end to generate far more user uptake than those launched by CSOs¹⁰ or donors, with a few exceptions."¹¹

⁸ Guberek, et al, 2014. 21

⁹ Formerly known as Yahoo and recently acquired by Verizon

¹⁰ "CSOs" = civil society organizations

¹¹ Peixoto, Tiago and Micah L. Sifry, eds. 2017. Civic Tech in the Global South: Assessing Technology for the Public Good. Washington, DC: World Bank. License: Creative Commons Attribution CC BY 3.0 IGO, 67

ICT can be applied to help support a variety of human rights issues related to civil-political, socio-economic, and developmental human rights, as defined below.

Human Rights Categories ¹²

ICT can be used as a supportive tool in efforts to protect, respect, and remedy overlapping categories of human rights (this report focuses on the first two, civil-political and socio-economic).

1	2	3
Civil-political human rights include norms pertaining to:	Socio-economic human rights include norms pertaining to the provision of goods meeting:	Socio-economic human rights include norms pertaining to the provision of goods meeting:
Physical and civil security (for example, no torture, slavery, inhumane treatment, arbitrary arrest; equality before the law).	Social needs (e.g., nutrition, shelter, health care, education).	The self-determination of peoples (for example, to their political status and their economic, social, and cultural development).
Individual, civic, and political liberties and empowerments (for example, freedom of thought, conscience, and religion; freedom of assembly and voluntary association; political participation in one's society).	Economic needs (for example, work and fair wages, an adequate living standard, a social security net).	Certain special rights of ethnic and religious minorities (for example, to the enjoyment of their own cultures, languages, and religions).

The intent of this Report is to build awareness for the potential of ICT, and the ICT industry, in supporting human rights. Today, the world has only begun to scratch the surface of this potential.

The ICT industry itself needs to become more aware of this potential as well. Human rights underpin the 17 United Nations Sustainable Development Goals (SDGs).¹³ Research conducted by the Global e-Sustainability Initiative (GeSI) finds that the SDGs represent a USD \$2.1 trillion commercial opportunity for the ICT industry. The billions of individuals that could utilize ICT products and services to protect their rights represent potential customers, employees, and investors for the industry in the future as well as today. In other words, not only can ICT help advance human rights, it is in the interests of the industry to do so.

Currently there is broad public access to technologies that were previously accessible only to select governments, but it remains to be seen whether the preponderance of future use will be for good or ill. The descriptions of world-changing technology for human rights could be viewed from an optimistic lens that promises a world where citizens everywhere live secure lives of opportunity. Or it could foreshadow the very opposite if governments, organized crime, and anti-democratic-rule-of-law interests use the technology to suppress human rights. For the long-term sustainability and prosperity of the ICT sector, it is imperative that the more positive uses and outcomes are aided and advanced.

¹² SUNY Levin Institute, "Three Generations of Human Rights," <http://www.globalization101.org/three-generations-of-rights/> (retrieved on April 21, 2018).

¹³ For information on linking human rights to the SDGs, see Shift, "Business, Human Rights and the Sustainable Development Goals: Forging a Coherent Vision and Strategy," Paper Commissioned by the Business and Sustainable Development Commission. November, 2016. <http://businesscommission.org/our-work/business-human-rights-and-the-sdgs>

This Report focuses on four key messages discussed further in ensuing sections.

- ICT (also referred to as digital solutions) can be applied constructively to help address and arrest human rights abuses that threaten individual well-being
- Technology for human rights makes good business sense.
- The potential role of the ICT Industry could be greatly enhanced. It has the capability to scale up solutions as a vital partner for human rights defenders.
- Partnerships are essential. This Report calls for a Partnership to advance technology for human rights.

These four messages come with four provisos.

The first proviso reminds that technology often possesses a two-sided nature. The same instruments can support human rights or violate them, depending on the way users apply them.

"Technology is neither good nor bad; nor is it neutral." ¹⁴

For example, the rapid development of geolocation, satellite imagery, and remote sensing will provide human rights workers with one of the most powerful tools they have ever had to document and prove abuses, and to develop analysis that helps citizens in need access vital resources essential for well-being. If misapplied, it could also potentially create a serious threat to individual security, freedoms, and privacy.

The typical response to the two-sided nature of technology veers back and forth between the poles of unbridled enthusiasm to abject fear. ¹⁵ A better route forward will take a clear, goal-oriented view regarding what is required among well-intentioned partners to create the conditions by which the technology maximizes its benefits for human rights and minimizes its risks.

Organizations like WITNESS are working to manage the conflict the two-sided nature of technology creates. WITNESS is fighting those that would use video imagery to humiliate victims, incite fear or spread messages of hate by developing verification tags to distinguish legitimate video imagery that documents human rights abuses versus those that have been faked. ¹⁶ There are opportunities to support and expand efforts like this across the scope of ICT platforms and tools.

While this report focuses largely on the positive, enabling potential of technologies, later sections of the report reinforce that it will be the responsibility of industry, government, and civil sectors to work together to ensure that technology for human rights does not engender negative consequences.

The second proviso is that vigilance is essential. In order to use ICT to make human rights activists and organizations more effective, the ICT industry and public and civil sector actors should dialogue about maintaining a foundation of responsible practices. This is not only about ensuring responsible behavior from the industry. Use of the technology for human rights comes with its own complexity. Application of technology can potentially harm the well-being of either or both a human rights investigator or an intended beneficiary as the technology could potentially create backlash among those that would try to undermine data privacy, freedom of expression, freedom of association, or other fundamental rights that result in harming safety and security. Technology for human rights needs to include "security tools to help individuals control access to their information." ¹⁷

¹⁴ Carr Center for Human Rights Policy, "Human Rights and Technology in the 21st Century," Harvard Kennedy School: Conference Report. November 3-4, 2016. 34

¹⁵ Guberek, et al, 2014, 2

¹⁶ <https://witness.org/our-work/tech-advocacy/>

¹⁷ Guberek, et al, 2014, 1-2

The third proviso is that collaboration is essential and the ICT industry must be an active partner in the effort. “A variety of stakeholders (including academia, private sector, and domestic and international NGOs) [...] need to collaborate to create shared value and collectively mitigate risk. No single entity can realize data-driven projects in this field by themselves. Nor can they mitigate risk on their own since they are just one link in the ‘data chain’.”¹⁸

The fourth proviso is that technology for human rights is not a panacea. It has the potential to be a powerful enabler of human rights but not a determinant by itself. The ultimate goal is to use ICT in the service of human rights.¹⁹

The following sections investigate the emerging development of technology for human rights, i.e., technology that is used to protect, respect, and remedy the rights of individuals. There is a burgeoning field of technology for human rights led innovative social entrepreneurs based in NGOs, government agencies, multi-lateral organizations, for profit startups, and large, established ICT companies. This Report shares and categorizes these examples. It provides a framework for companies, civil society, and government agencies to take advantage of the opportunity to partner in using technology for human rights to enable human rights. It suggests next steps to help human rights defenders realize the potential of technology for human rights.

The potential of technology for human rights is not guaranteed. The same technologies that could protect and remedy human rights abuses might be used to undermine them. A lack of imagination, understanding, resources, or relationship with the industry may inhibit the ability of human rights defenders to adequately utilize ICT to support human rights. In this regard, the most productive route forward is for the ICT Industry, in collaboration with human rights defenders, to find a shared, galvanizing purpose that captures the imagination and creative energies of employees, customers, and communities alike to determine how innovations and resulting products and services can be used to transform conditions to ensure human rights are protected and supported. The power to utilize ICT to advance a transformative generation of technology for human rights rests in all our hands.

¹⁸ Carr Center, 26

¹⁹ Guberek, et al, 2014. 8



IV. The Need for and the Benefits of Technology for human rights

At least 2.6 billion people – 36% of the global population – face persistent, potential threats to their rights. These individuals live in places categorized as “not free.”²⁰ This includes governments that monitor their citizens’ internet use and have censored or imprisoned people for freely expressing opinions online. The number of “rights-constrained” individuals is likely underestimated. Freedom House identifies 1.7 billion living in “partially free” locations.²¹ In addition:

- An estimated 2.5 billion people lack formal title to the lands where they live;
- There are approximately 246 million child laborers worldwide ;
- 121 million children and adolescents have never had the chance to attend school, or have been forced to drop out. 40 million children below the age of 15 suffer from abuse and neglect;
- Approximately 21 million people are currently enslaved in the human trafficking trade around the world;
- More than 20 million refugees have lost their homes and fled their countries because of conflicts and persecution; most of them have scant support and as a result are left destitute. Millions of refugee children receive little or no education. In these areas of conflict, Humanitarian workers are often kidnapped and attacked, and relief trucks are looted;
- More than 300,000 children under the age of 18 are being exploited as child soldiers in armed conflicts worldwide;
- Protestors of repressive governments have been killed, beaten, and arrested by police in the streets for voicing their opinions of reforms;
- Around the world, women and girls face discrimination at home, in schools and in the workplace. Harassment and violence in the physical world has crossed over to the digital world, pushing many away from social media and restricting the space to freely express their opinions;
- The majority of people online—60 percent of internet users—live in countries that have engaged in some form of censorship. Every day, important news is silenced and activists are repressed by governments who want to limit free expression. Digital attacks can take news sites offline for as little as \$20, and government firewalls can prevent people from finding information that matters to them. In some countries journalists risk prison or torture to report on important issues, and some governments pass increasingly harsh laws that crack down on free speech;
- In many countries, activists and journalists are harassed and imprisoned for speaking out against corruption and abuses of power.²²

²⁰ World Freedom Report, Freedom House, 2016, https://freedomhouse.org/sites/default/files/FH_FITW_Report_2016.pdf

²¹ World Freedom Report, Freedom House, 2016, https://freedomhouse.org/sites/default/files/FH_FITW_Report_2016.pdf

²² Sources: Do Something, 2017, <https://www.dosomething.org/us/facts/11-facts-about-human-rights-violations>; Luxton, Emma, “10 Things to Know about Human Rights,” World Economic Forum, 10 December, 2015. <https://www.weforum.org/agenda/2015/12/10-things-to-know-about-human-rights/>; <https://jigsaw.google.com/challenges/>; Mingle, Jonathan, “The Unfinished Work of Vanu Bose,” MIT Technology Review. October 24, 2017. https://www.technologyreview.com/s/609009/the-unfinished-work-of-vanu-bose/?utm_term=.o_g97ed6f472-27fbffcf1-; Elsayed-Ali, Sherif, “Can technology help solve human rights challenges? We believe it can.” Amnesty International, 19 December, 2016. <https://www.amnesty.org/en/latest/research/2016/12/technology-can-help-solve-human-rights-challenges/>

a) The Information and Communication Needs of Human Rights Defenders

Billions across the developing and developed world alike, confront threats to their basic human rights. Individuals suffering human rights abuses, along with those that live in a persistent state of threat (i.e., “rights-constrained” individuals), lack access information and communication resources that could help improve their condition. Providing them access to information and communication resources would go far in helping to protect, remedy, or reduce the risk of human rights violations. Vital ICT needs for rights-constrained individuals and those that defend them include the following.²³

Civic Tech

The need: fundamental rights are often threatened when individuals are unable to hold governments, corporations, and other institutions accountable for decisions and behaviors that may negatively impact well-being and freedoms. One sees examples when institutions make choices to dump toxic pollutants in local aquifers, misappropriate development aid, or knowingly encourage factories to violate the rights of workers. Civic tech is “the use of technology for the public good” or, more specifically, any technology that is used to empower citizens or help make government and other institutions “more accessible, efficient, and effective.” Civic tech “dramatically lowers the costs for governments and third parties to establish channels for citizens to project their voices and express their needs.”²⁴ A core feature of civic tech is to promote openness and transparency that helps citizens readily monitor and participate in government decision-making.

Key technologies, include applications for civic tech software applications that enable individuals to communicate their needs and expectations to decision-makers; that create transparency allowing citizens to understand decisions and track their implementation; that trace and tag the flows of key assets (from food, to finances and a variety of goods and services in between) to ensure they are ethically sourced and delivered; and technologies that enable citizens to safely communicate shortfalls to human rights defenders. In addition, the key technologies described below for that support data analysis, data collection, and digital networks aid civic tech as well.

For example, “the factory workers who make our clothing and electronics are invisible. They have no channel to report unsafe conditions, harassment, or exploitative practices to decision-makers. LaborLink²⁵ leverages the rapid spread of mobile phones to establish an anonymous two-way communication channel for workers to report on true conditions with no fear of retaliation, and for companies to receive real-time data directly from workers 365 days a year. LaborLink provides the tools to conduct surveys and present data in easy to understand formats that support business decision making.” LaborLink currently accesses 1,055,270 workers, across 16 countries, with 3,236,002 data points collected.²⁶ Such technologies expand and scale-up the use of grievance mechanisms – a core process encouraged by human rights advocates. ICT permits monitoring and reporting through surveys administered via SMS, or tip/reporting lines that use VOIP (voice over internet protocol) where workers may not have access to a phone line or other methods of reporting abuse.

Data analysis and visualization to identify and forecast human rights violations

The need: ICT is both creating an enormous volume of information (from video uploaded to web platforms to chats shared on social media – see Box 1), and creating the means to digitize and process vast amounts of analog information. The Internet of Things (IoT) is creating entirely new datasets as well. Analytics can be used to extract meaningful conclusions from a voluminous repository of data. Data analytics for human rights can help assess risks, uncover violations, predict threats, and assess the efficacy of proposed interventions. Human rights analytics need the capability to process a variety of data formats including quantitative information; images; audio; text; and qualitative information such as stories and interviews. They need to support retrospective, forensic analysis as well as generate forward-looking predictions. Analytic outputs need to provide factual descriptions as well as draw inferences. Finally, analytics need to present information in compelling and understandable visual formats such as infographics, maps, images, presentations, reports, and stories.

²³ The ensuing list of technologies are drawn and adapted from the following sources: Guberek, et al; Carr Center; Ng, 2016; GeSI, 2016

²⁴ Civic Tech, 46

²⁵ <https://www.mylaborlink.org/>

²⁶ <http://goodworldsolutions.org/#labor-link>

Box 1: Data for Human Rights

"Every minute another 300 hours of video is uploaded to YouTube, with estimates pointing to an increase to 500 hours a minute in the near-term [...]. [A]n average of 58 million tweets are sent each day. Facebook's 1.7 billion users [as of November 2016 – by the end of 2017 this figure was 2.2 billion] share approximately 1 million links to other Internet content every 20 minutes. Some small percentage of all that content is germane to human rights abuse investigations. How to find that needle in the haystack?"²⁷

Key technologies include²⁸ analytical software; machine learning/artificial intelligence (AI) capabilities that allow pattern recognition both within and across datasets (e.g., synthesizing analysis of video imagery with social media commentary, and searches of journalist reports); visualization programs; mapping programs; and social computation (see Box 2 below).

For example Microsoft and the Office of the UN Office of the High Commissioner for Human Rights (UN OHCHR) have launched a five-year partnership. Microsoft will provide a grant of USD \$5 million to support the work of the UNHCR. A particular area of focus will be the development and use of advanced technology designed to better predict, analyze and respond to critical human rights situations. One example is Rights View, an information dashboard powered by cloud computing and big data analysis. The system pulls data together to create a database of recorded human rights violations across countries. Analytics enable UN human rights workers to aggregate large quantities of internal and external data on specific countries and types of rights violations in real time. It will help facilitate analysis, ensure early warning of emerging critical issues and provide data to guide responses.²⁹ Rights View will draw together internal data from across the various areas of the Office, external public data, as well as social media in order to promote action in relation to early warnings of human rights risks. The overall aim is to "provide a clear human rights perspective on potential, emerging or ongoing crises, and to get the appropriate responses to them by engaging other parts of the U.N. and the international community more broadly." Rights View will help produce reports, talking points, briefings to bodies, and "short, pithy, visually compelling information to have a more immediate impact on the situation." The tool will also help UNHCR to be more efficient at deploying its own staff to emergency situations and to more efficiently monitor, analyze and report on situations remotely.³⁰

Box 2: Social Computation

"With respect to analysis, algorithms will save the day, but only to an extent. Social computation is also needed." Social computation uses digital networks to mobilize volunteers to help analyze large volumes of data that require human insight and interpretation. The processes used are similar to crowdsourcing. However, it's distinct in that social computation, "involves recruiting large numbers of volunteers over a digital network to analyze small portions of a larger data set, such as a satellite image.

Examples[...] include Decode Darfur, Amnesty's effort to monitor attacks on the Darfur region of the Sudan.³¹ Using their computers and phones, 28,600 volunteers from 147 countries contributed more than 9,000 hours in analyzing 326,000 square kilometers of satellite imagery to identify Darfur's most remote villages. Volunteer "Decoders" compared images of the same village and looked for evidence of attacks, by helping identify significant change in buildings and structures over time.³²

²⁷ Carr Center, 13.

²⁸ Lists of key technologies are meant to be indicative but not comprehensive.

²⁹ Microsoft, "Technology for human rights: UN Human Rights Office announces landmark partnership with Microsoft," 16 May, 2017. <https://news.microsoft.com/2017/05/16/technology-for-human-rights/#1h6ZbHCIZvrGqsXA>.⁹⁷

³⁰ Microsoft, 2017;

Solomon, Feliz, "Microsoft Pledges \$5 Million to U.N. Human Rights Office" Fortune, 16 May, 2017. <http://fortune.com/2017/05/16/microsoft-human-rights-technology/>

³¹ Carr Center, 30-31

³² <https://decoders.amnesty.org/projects/decode-darfur>

Human rights data collection and management

The need: big data analytics rely on the ability to collect, store, manage, and continually monitor essential data. Human rights defenders need to observe and capture evidence of human rights violations, creating data repositories and archives that support the development of cases and related evidence, searches, and enable analysis.

Key technologies include apps applied across devices; crowdsourcing applications; social media; remote sensing and imaging and IoT solutions; tagging and traceability solutions from software to sensors such as RFID; forensic technologies supported by software analytics; relational databases stored locally, via the web, or on other cloud-based platforms; web browsers; email; text messaging and instant messaging; cloud storage facilities; search engines; scanning; word processors; spreadsheets; and voice over internet protocols (VoIP).

For example, “The Historical Archive of the National Police (AHPN) in Guatemala has [...] engaged in a massive effort to digitize millions of state records to preserve them for researchers and citizens for use in ongoing work to uncover the violence of the past. The digitization process has helped investigators locate evidence to support criminal prosecutions of perpetrators of kidnappings and disappearances carried out decades ago. Such projects highlight the importance of long-term preservation of data that will be critical to justice, truth and reparations, which often require information decades after the time of the incident or the collection of the data.”³³

Human rights data security

The need relates to the preservation of three kinds of security. The first ensures that vital data repositories stay secure and are not compromised, erased, hacked, or stolen. The second need is to ensure that those that share data can do so privately without risk of exposure.³⁴ The third is to use technology to help citizens maintain their privacy and freedom of expression.

Key technologies include encryption, circumvention tools, back-ups, servers, mirroring, and mobile device security tools.

For example, Detekt is a free tool that scans a computer for traces of known surveillance spyware used by governments to target and monitor human rights defenders and journalists around the world.³⁵

Engaging digital and high-speed communication networks for human rights

The need is to take advantage of digital platforms that can link individuals in different locations working towards the common goal of protecting and remedying human rights violations around the world. This means taking advantage of network infrastructure such as broadband and mobile while leveraging the platforms that enable individuals to connect, communicate, and share knowledge. Digital networks can share vital information on emerging risks, provide education and training on ways to defend individual rights, collect data essential to building evidence against perpetrators, and support data analytics for rights.

Key technologies include high speed communications network infrastructure, social media sites, web platforms, text messaging, cloud sharing, email, VoIP, and other mechanisms to connect those that use devices.

³³ Guberek, et al, 2014. 27

³⁴ This is another area where the dual nature of human rights technology must be acknowledged and respected. It is important to help human rights defenders communicate on a secure network. However, in other contexts, fully secure networks have the potential to be exploited by those that would seek to compromise human rights.

³⁵ https://www.amnesty.org/en/latest/news/2014/11/detekt-new-tool-against-government-surveillance-questions-and-answers/?_ga=2.242753153.243294471.1494237272-2017147212.1494237272

For example, Deutsche Telekom has developed and launched the careers4refugees.de portal. Large and small enterprises can post their job vacancies free of charge on the site that is geared specifically to refugees. This portal has been created so that businesses can easily post their jobs, and the portal can be automatically linked with a company's own recruiting system. This makes job posting and recruiting processes much easier. More than 200 job offers have already been added to the portal.³⁶

FinTech³⁷ for rights

The need: currency volatility, a lack of transparency, a lack of clarity about investments, the risk of corruption, and a dearth of systems documenting credit-worthiness can deny individuals and families the right to earn living wages and benefit from banking and other financial services. Financial technology (FinTech) can help reduce risk, create audit trails, collect and analyze data, and promote transparency. This enables banks, aid organizations, government agencies, and employers to provide a range of financial instruments such as paychecks, aid, loans, and tax reimbursements to individuals with confidence. Mobile payment systems can create added security that prevents theft and encourages ease of payment. FinTech solutions, such as the well-known Safari.com has shown potential to reduce corruption and increase the participation of those often excluded from the formal economy in areas such as business creation; access to finance; innovations that allow the unbanked to define fractional ownership of assets; and transparency of aid and tracking of development funds. In addition, FinTech applications such as blockchain show the potential for use beyond finance to support improved identity applications; recovery from disasters and humanitarian crises; food trust and supply chain traceability; and efforts to stop human trafficking.

Key technologies include distributed ledger technology known as blockchain, smart contracts, and cryptocurrencies that relate and connect to digital networks, data analytics technologies, machine learning/artificial intelligence, and IoT solutions.

For example, the United Nations (UN) launched a trial to distribute funds to thousands of people in Jordan using the ethereum blockchain. Cryptographically unique coupons representing an undisclosed number of Jordanian dinars were sent to dozens of shops in five refugee camps across the nation. Eye-scanning hardware made by London-based IrisGuard verified the identity of coupon recipients who then could redeem the entitlements at the point of checkout. In the trial completed on May 31, 2017, the platform was successfully used to record and authenticate transfers for about 10,000 individuals. "All funds received by the refugees from WFP were specifically used to purchase food items such as olive oil, pasta and lentils [...]. [T]he WFP intends to expand the project to include 100,000 individuals in Jordan as soon as August. If that goes according to plan, the effort is set to grow to serve the entire Jordanian refugee population by the end of 2018. Currently, [WFP] is in talks with partners in the humanitarian and private sectors who can help it with [the] goal of achieving Zero Hunger by 2030."

Digital technology for human rights forensics and monitoring

The need: "Forensics is the [...] collection, preservation, examination and analysis of evidence of abuses and crimes for documentation, reconstruction, and understanding for public and court use."³⁸ Forensics and monitoring are vital to redress human rights violations. "Central to the business of both offline and online human rights defense are the tasks of monitoring and producing evidence of abuses. The production of defensible evidence is a cornerstone of credible advocacy, effective accountability, and comprehensive historical clarification."³⁹ Iron clad evidence is often necessary to persuade courts and the public to hold perpetrators to account, particularly when leaders and political majorities are under scrutiny. Among the most promising use of ICT is to synthesize data from geospatial/satellite imagery, video and other data from digital networks, and software analytics from biological data such as DNA sequencing (see Box 3).

³⁶ https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2017/02/The-Importance-of-mobile-for-refugees_a-landscape-of-new-services-and-approaches.pdf

³⁷ Sources for FinTech include: Blakstad, Sophie, and Allen, Rob, "How can green fintech help save the planet?" Ericsson, 28 September, 2017; and, del Castillo, Michael, "United Nations Sends Aid to 10,000 Syrian Refugees Using Ethereum Blockchain." Coindesk, 13 June, 2017. <https://www.coindesk.com/united-nations-sends-aid-to-10000-syrian-refugees-using-ethereum-blockchain/>

³⁸ Carr Center, 2

³⁹ Guberek, et al, 2014. 20

Box 3: Synthesizing Digital Technology to Support Human Rights Forensics

"Today, scores of commercial high-resolution satellites are available to human rights organizations. Additionally, social media and other digital platforms sometimes offer information that help investigators understand an event. And forensic science organizations now have access to sequencing technology that undermine efforts to thwart the identification of remains, such as the disassociation of remains by exhumation and reburial [...]. Remote sensing, DNA sequencing, and data mining have emerged as valuable techniques for investigating and gathering evidence

of human rights abuses and war crimes. Satellite imagery, for example, locates where the earth has been disturbed, suggesting possible mass graves, while DNA sequencing helps identify the dead once (if) they are exhumed. Information parsed from the Internet (whether videos uploaded to YouTube, photographs shared on social media, or communications posted to Twitter and other platforms) can also provide important contextual information that corroborates information collected by satellites."⁴⁰

Key technologies include data analytics that can process huge amounts of geospatial data; multispectral, radar, and change detection capabilities;⁴¹ commercial remote sensing satellites; geographical information systems (GIS); unmanned aerial vehicles (UAVs) and geographical positioning satellites (GPS) and receivers to track events on earth;⁴² remote sensors that support the Internet of Things; data from the variety of platforms that compose digital networks, particularly video and crowdsourcing; machine learning/AI that enables data integration, pattern recognition, and analysis; data mapping and visualization; and data collection capabilities.

For example, "Video forensics – the detailed, frame-by-frame analysis of videos and other images – can also be used to catalogue violations. In Syria, [Human Rights Watch] used this technique, as well as satellite imagery and eyewitness testimonies, to document in great detail the government's use of chemical weapons in Ghoutta in August 2013."⁴³

⁴⁰ Carr Center, 5-7

⁴¹ Carr Center, 47

⁴² Carr Center, 2

⁴³ Levine, Iain, "Will technology transform the human rights movement?" Human Rights Watch, 26, March, 2014. <https://www.hrw.org/news/2014/03/26/will-technology-transform-human-rights-movement>

Figure 1 summarizes the information and communication needs of human rights defenders, mapped against some of the key technologies that the ICT industry can bring to bear.

Figure 1: Human Rights Information and Communication Needs Supported by Digital Solutions

Key Technologies	Applied for the Following Uses	Can Help Support Efforts to Address Human Rights Challenges
Analytic & predictive software Audio Blockchain Circumvention tools Cloud computing Communications software Crowdsourcing apps Cryptocurrency Data mapping Data imaging Encryption Geospatial / satellite imaging Internet of Things Machine learning/ AI Mirroring Mobile service security Relational databases Remote sensors Search engines Servers Social computation Social media Spreadsheets Text messaging Video VoIP Web browsers	Data analysis and visualization to identify and forecast humans rights violations. Human rights data collection and management. Human rights data security to ensure the privacy of information collected, shared, and used by defenders of human rights. Engaging digital and high-speed communication networks for human rights. Applying digital technology for human rights forensics and monitoring. Traceability and tagging.	1a Civil-political human rights related to physical and civil security Protecting Child Safety Online Preventing Human Trafficking Preventing injustice and Corruption Protecting Safety and Security 1b Civil-political human rights related to individual, civic, and political liberties and empowerments Supporting Labor Rights and Responsible Supply Chain Practices Protecting Land rights and Identity Protecting Privacy and Freedom of Expression Strengthening the Rights of Citizenship 2 Socio-economic human rights Enabling Access to Resources Essential for Development 3 Collective developmental rights

Figure 1 shows that digital solutions have the capability to address essential needs that will enable individuals and their champions to protect, respect, and remedy human rights.

b) The Role for the ICT Industry

The ICT Industry represents a vital partner because of its capacity to provide the digital solutions that address essential human rights information and communication needs. The ICT industry maintains a portfolio of every critical technology listed in figure 1 above. As a partner the industry has the potential to go well beyond the provision of technology for human rights products and services, to scale-up efforts to respect, protect, and remedy human rights. The ICT industry possesses unique characteristics that will benefit human rights defenders, such as its:

- **Diffusion speed and reach:** “Digital solutions diffuse at unprecedented speed and reach while increasing access to goods and services in a more people-centric, affordable and sustainable way. Consider the fact that today only 17 per cent of Sub-Sahara’s rural population can connect to an electricity grid, over 130 years after grids were invented. But digital works at a different speed: 70 per cent of the Sub-Saharan population can have access to a digital mobile network, just 23 years after the first digital networks became available. Compared to the electricity grid, this is 23 times higher diffusion speed and reach.”⁴⁴ At the same time the current number of mobile subscriptions⁴⁵ exceeds the world’s population and smartphones account for 55% of all mobile subscriptions. “With more than 7.5 billion mobile connections and 3.7 billion unique subscribers worldwide, mobile broadband has the potential to play a role unlike any other technology” in supporting humanitarian response and human rights.⁴⁶ However, technology for human rights can only meet its potential in a world that is connected and where individuals have access to the best, fastest, and secure communications networks.
- **People-centric approach:** the industry has demonstrated an unequalled ability to anticipate and shape consumer demand for products and services that shape fundamental aspects of their lives: how they access information; how they maintain relationships; how they work; and how they consume entertainment. “[W]hen large numbers of people voluntarily adopt new digital solutions, automatically social, economic and environmental benefits flow from them, many of which have direct and indirect bearing on the SDGs. For example, wearable health monitoring equipment is becoming increasingly popular, and now enjoys three figure growth rates, enabling people to track their health and to respond to problems. Likewise, in least developed and developing regions, some health workers are starting to use mobile-based programs to learn how to administer new treatments – saving them time and money.”⁴⁷
- **New business models:**⁴⁸ the industry enables individuals to develop and launch wholly new and disruptive businesses that enable the provision of goods and services previously thought to be unavailable or restricted, to masses of people living in every corner of the planet at dizzying speed. Human rights defenders have joined in, forming for-profit social enterprises that use commercial approaches to generate resources that will sustain and expand company missions to defend rights. One example is LaborVoices, which uses smart phones to crowdsource information key to enabling brands to monitor the impact of their suppliers on the rights of workers.⁴⁹

⁴⁴ GeSI, 2016, p. 5.

⁴⁵ Weidman-Grünwald, “How can businesses help prevent the sexual exploitation of children online?” Ericsson, 18 January, 2017. https://www.ericsson.com/thecompany/sustainability_corporateresponsibility/technology-for-good-blog/2017/01/18/4225/

⁴⁶ Weidman-Grünwald, “How should the humanitarian sector respond to the Fourth Industrial Revolution?” Ericsson, 19 January, 2017. https://www.ericsson.com/thecompany/sustainability_corporateresponsibility/technology-for-good-blog/2017/01/19/how-should-the-humanitarian-sector-respond-to-the-fourth-industrial-revolution/

⁴⁷ GeSI, 2016, p. 10.

⁴⁸ GeSI, 2016, p. 10.

⁴⁹ Steinmeyer, Alysia, “A ‘Symphony’ of Worker Feedback Adding New Level of Transparency to Supply Chains,” Sustainable Brands, 30 June, 2016. http://www.sustainablebrands.com/news_and_views/supply_chain/alyisia_steinmeyer/symphony_worker_feedback_adding_new_level_transparency.

- **Ability to facilitate innovation:** the industry is an innovation powerhouse, able to translate its research and development (R&D) and product design capabilities to address the needs of millions to billions.
- **Shared interest in respecting human rights:** The ICT industry and human rights defenders share common interests in promoting freedom, individual security, access to information, and open communication. When interests align, there may be opportunities to find common areas for companies and NGOs to jointly disseminate information, encourage policy, and promote human rights to the wider public.

The ICT industry's potential as a partner becomes clear when one compares the industry's impact on other, urgent societal needs that possess a strong symbiotic relationship to human rights. For example, at the present rate of ICT adoption, GeSI's landmark research finds that digital solutions have the potential to:

- Create over USD \$9 trillion of economic benefits to business, government, and individuals;
- Decouple economic growth from carbon emissions, reducing greenhouse gas by 20% of 2015 levels by 2030;
- Connect 2.5 billion people to ICT networks;
- Reduce poverty by one-third;
- Increase access to education for 450 million people.⁵⁰

Yet, the R&D driving technology for human rights appears to come predominantly from smaller start-ups, social enterprises, and NGOs. In and of itself the role of smaller-sized entrepreneurs is not a concern, in fact it is a strength. The ICT industry was started by innovators often working in their homes. However, engaging larger players in the industry represents an opportunity to achieve even more.

Currently, ICT industry leaders are typically asked by their stakeholders to focus on managing and reporting on the potential impacts of their operations on three principal concerns:

- **Privacy and freedom of expression.** Multi-stakeholder initiatives such as the Global Network Initiative (GNI) have formed common standards for the industry. Companies such as AT&T, BT, Deutsche Telekom, and Verizon have begun to publish "Transparency Reports" that document commitments and performance in protecting privacy, data security, and freedom of expression.
- **Business relationships.** How should the industry be held accountable for the way that partners, end-users, suppliers, and governments use its technology? This concern speaks to the two-sided nature of digital technologies described above. In response, some ICT companies are beginning to adopt "Know Your Customer" processes that flag the institutional customers who are high risks to misuse technology and violate human rights.⁵¹
- **Human and labor rights in the supply chain.** Every industry with an extended, global supply chain faces risks that factories and other suppliers may violate the rights of workers, utilize modern slaves, or employ child labor. Organizations such as the Global e-Sustainability Initiative (GeSI) and the Responsible Business Alliance have created programs to help ICT companies and their suppliers implement policies and processes to reduce these risks and to ensure rights are respected and violations are remedied.

⁵⁰ sources: GeSI, 2016; GeSI, "#SMARTer2030: ICT Solutions for 21st Century Challenges." 2015.

⁵¹ Cohn, Cindy, Timm, Trevor, and York, Jillian C. "Human Rights and Technology Sales: How Corporations can Avoid Assisting Repressive Regimes," Electronic Frontier Foundation, 2012. <https://www EFF.org/document/human-rights-and-technology-sales>. 3-4

Certainly the industry should continue to focus on these and other concerns. Alongside these priorities, it would be wise to encourage ICT industry leaders to invest greater time and attention to partnerships that advance technology for human rights.

c) The Business Case for Technology for human rights

One must be cautious when discussing a “business case” for human rights. Such a business case cannot allow for greenwashing. In addition, the business case must delicately align incentives so that the driving force of commercial motivations result in greater protection, respect, and remedies for civil-political, socio-economic, and collective developmental rights. What underpins the business case made in this Report is the focus on deploying technologies that are applied first and foremost for the benefit of human rights, with ancillary returns such as the opportunity to build and grow new markets, to encourage deployment of technology infrastructure, and to build increased trust for the industry. In this context, at least four business cases for technology for human rights have the potential to achieve this kind of alignment.

The first is the ability of technology for human rights to help address risks that affect the financial competitiveness of the ICT industry. The root of the ICT industry’s business model is intertwined with the fundamental laws and regulations that support the protection and provision of rights. How information and communication is controlled affects rights. How rights are protected affect the ability of companies to expand business models around information and communication technology. How companies support either the control or freedom of rights affects the way customers, employees, and investors trust the industry. These kinds of competitive risks are hard to quantify in part because they are so vast. Yet, in 2015 government-led internet shutdowns cost countries USD \$2.4 billion. This estimate did not attempt to calculate the full costs to the ICT industry which might increase this figure substantially (see Box 4).

Box 4: Risks of Human Rights Violations to the ICT Industry

“Every year, more and more consumers and businesses are engaging in e-commerce and online transactions. Internet disruptions slow growth, cost governments tax revenue, weaken innovation, and undermine consumer and business confidence in a country’s economy.

As internet-powered businesses and transactions continue to grow to represent an increasingly significant portion of global economic activity, the damage from connectivity disruptions will become ever more severe [...]. In 2011, Egyptian authorities were worried about street protesters who were demonstrating against the government. Seeking to disrupt their communications and ability to attract supporters, officials there shut down the entire internet for five days. The damage was swift and dramatic. Businesses could not engage in e-commerce or provide digital products and services.

Friends and family couldn’t communicate with one another. Students were unable to complete online assignments and teachers couldn’t plan their lessons. Hospitals and factories lost access to online information, thereby undermining productivity and potentially costing jobs and lives. In the aftermath of the shutdown, the Organization for Economic Development and Cooperation (OECD) found that the decision to cut connectivity cost Egypt \$90 million. If continued for an entire year, the shutdown would have reduced the country’s Gross Domestic Product by three to four percent [...]. [B]etween July 1, 2015 and June 30, 2016, these [government mandated] shutdowns cost at least US \$2.4 billion in GDP globally [...]. These are conservative estimates that consider only reductions in economic activity and do not account for tax losses or drops in investor, business, and consumer confidence.”⁵²

The second business case relates to **long-term commercial growth**. The UN states that individuals should enjoy the same kind of human rights online as they do offline. This ties to the UN's goal to encourage as many as possible to gain access to the internet (see Box 5). As much as 15% of the global population — 1.1 billion people — live in areas with little or no communications coverage.⁵³ The ICT industry has long been aware that as more individuals become connected, industry earnings increase. Studies find that a 10% increase in mobile broadband adoption leads to a 0.6 – 2.8% increase in economic growth,⁵⁴ while a 10% increase in fixed broadband adoption increases GDP 1.35% in developing countries and 1.19% for developed countries.⁵⁵ As more individuals gain access to the internet and related communication platforms, whole economies and the ICT industry along with it will benefit. Moreover, as individuals gain access, increasing numbers will have both the freedom and wherewithal to fully capitalize on the scope of products and services the ICT industry provides. Over the longer term, greater access to and protection of human rights represent a growth engine.

Box 5: Promotion of human rights online

"The centrality of the internet to social and economic life recently led the United Nations to enact a resolution supporting the 'promotion, protection and enjoyment of human rights on the Internet.' The resolution specifically '[c]ondemns unequivocally measures to intentionally prevent or disrupt access to or dissemination of information online in violation of international human rights law and calls on all States to refrain from and cease such measures'."⁵⁶

The third business case relates to more **immediate revenue opportunities**. GeSI finds that the SDGs will create a USD \$2.1 trillion market opportunity created for the ICT industry, *a 60% increase compared to current ICT-sector revenues*.⁵⁷ In addition, as noted above, billions of people living in non-OECD and OECD countries alike – either are, or face the risk, of being "rights-constrained." Technology for human rights has the potential to be distributed through a variety of mechanisms. In some instances – although not all – commercial, profit-making vehicles may be the best route. A number of the examples shared in this Report come from businesses who intend to use the commercial marketplace as the best vehicle to drive uptake through "win-win" or "shared-value" approaches. In addition, digital solutions improve access to developmental rights such as education, health, and clean water. Developing technology for human rights opens up commercial opportunities for companies to do good and do well.

⁵² West, 2016. P. 1, 2, 10. Note that further analysis suggests that citizens may bear the brunt of both social and economic costs from government shutdowns.

⁵³ https://www.technologyreview.com/s/609009/the-unfinished-work-of-vanu-bose/?utm_term=o_997ed6f472-27fbffcf1-156370649&utm_content=buffer8fa2d&utm_medium=social&utm_source=facebook.com&utm_campaign=buffer

⁵⁴ Edquist, Harald, "New report proves mobile broadband drives global economic development" Ericsson, 14 September, 2017. https://www.ericsson.com/thecompany/sustainability_corporateresponsibility/technology-for-good-blog/2017/09/14/4524/

⁵⁵ West, 2016. P. 1.

⁵⁶ West, 2016. P. 1-2.

⁵⁷ GeSI, 2016. P. 3.

Finally, human rights represent a core pillar of any company's approach to sustainability and corporate responsibility. Companies in other industries that have been found complicit in human rights abuses have been swiftly punished by investors, regulators, consumers and activists. For example, direct costs after a supply chain disruption linked to human rights and other sustainability issues represent on average 0.7% of a company's revenue and an average 12% decrease in market cap valuation. Financial impacts were relative to the impact on brand value from bad supplier practices (e.g. child labor, local pollution) and the economic costs of supply chain disruptions (e.g. non-compliance with environmental regulations).⁵⁸ On the positive side, those companies that support human rights have received numerous benefits. Emerging evidence finds that the kinds of investments that a company would make to support human rights and responsible business practices have great potential to enhance enterprise value across a number of key performance indicators (KPIs) summarized in Figure 2.

Figure 2: The Potential Value of Supporting Human Rights⁵⁹

Business priority	Potential ROI from Corporate Responsibility and Sustainability
Employee engagement and morale	Improve employee engagement scores 8.5%
Market performance	Increase share price 4-6%
Productivity	Increase employee productivity up to 13%
Recruitment/Retention	Decrease employee turnover 25-50%
Sales	Increase sales 1-20%

⁵⁸ Oracle, "Embedding Sustainability in the Sourcing and Procurement Process Oracle Sustainability Solutions" ORACLE WHITE PAPER, APRIL 2015, p4, <http://www.oracle.com/us/products/applications/green/wp-sustainability-procurement-2525294.pdf>

⁵⁹ Rochlin, et al, 2015.



V. Using ICT to Support Human Rights

Both human rights defenders and ICT industry leaders have the potential to partner to improve the conditions and well-being of “rights-constrained” individuals around the world. This section illustrates how the technologies defined in Section III are being applied across a range of pressing human rights challenges. Human rights cover a wide range of topics. These can include what are sometimes referred to as “negative rights” – i.e., the safety and security to ensure that core fundamental conditions and needs will not be taken away. Then there are “positive rights” that ensure that people have access to conditions or resources that are fundamental to the ability to live and participate in society. Digital solutions can support efforts to protect and enhance both kinds of human rights. Some of the most promising areas, where in many instances technology for human rights is already being applied, include the following.

The following table identifies where ICT has great potential to support types of human rights.

1	Civil-political human rights related to physical and civil security	2	Civil-political human rights related to individual, civic, and political liberties and empowerments
	<ul style="list-style-type: none"> Protecting Child Safety Online Preventing Human Trafficking Preventing Injustice and Corruption Protecting Safety and Security 		<ul style="list-style-type: none"> Supporting Labor Rights and Responsible Supply Chain Practices Protecting Land rights and Identity Protecting Privacy and Freedom of Expression Strengthening the Rights of Citizenship
3	Socio-economic human rights	4	Collective developmental rights
Enabling Access to Resources Essential for Development			

a) Civil-political human rights related to physical and civil security

a1) Using Digital Solutions to Protect Child Safety Online

Children using digital networks face dangers such as bullying and harassment, sexual and other forms of abuse, exposure to sexual and adult content, privacy violations including identity theft, and exposure to unwanted and unwelcome influences.

Major telecommunications and internet service providers have taken action to monitor their content and networks. Constant vigilance is required and the industry needs to continuously monitor and update its own safeguards.

In addition, specialized digital solutions have the potential to provide extra security. Tracking software and apps can help parents monitor the online activity of their children across mobile and fixed online networks. Machine learning tools can identify and intelligently block inappropriate content such as child sexual abuse imagery. Data collection and forensic technology can help identify abusers.

For example, Deutsche Telekom has developed the Surfgarten browser for the iPhone, iPad, and iPod touch. The browser helps protect minors from offensive and unsafe content, in part by identifying the age-rating of websites.

Ericsson has developed a first-of-its-kind mobile application that equips adults – caretakers, teachers and parents – with the skills and resources necessary to recognize, prevent and respond to child sexual abuse. The “Stewards of Children Prevention Toolkit” mobile app was developed together with World Childhood Foundation, the non-profit organization Darkness to Light, and is available at www.socapp.org. The tool can identify images verified by law enforcement authorities as child sexual abuse images.

By monitoring external initiatives, performing benchmarks and promoting the exchange of best practices the European Telecommunications Network Operators’ Association (ETNO) has been encouraging its member companies to maintain a continuous and proactive approach to Child Safety, based on 3 essential pillars:

- **Education and awareness:** ETNO companies promote knowledge and responsible use of ICT services through educational programmes targeted at young people, parents and teachers, through online material and campaigns.
- **Safer and better products and services:** ETNO members continuously strive to make their services better and safer with the development of specially designed services for young people and children (special tariffs, dedicated areas and quality content, function-limited mobile devices, cost control solutions) and the inclusion of safety features in “established” broadband, mobile and IPTV services, such as parental control tools, PINs, reporting options, privacy settings and content classification.
- **Cooperation and Self-Regulation:** ETNO members are committed to self-regulation and engage in national, European and international collaborative initiatives addressing Child Safety.⁶⁰

a2) Using Digital Solutions to Prevent Human Trafficking

Those fighting the illegal smuggling and trafficking of human beings are increasingly turning to digital solutions for help. As background, human trafficking, also known as modern slavery touches every part of the globe:

- Nearly 21 million people are victims of forced labor – 11.4 million women and girls and 9.5 million men and boys;⁶¹
- Almost 19 million victims are exploited by private individuals or enterprises and over 2 million by state organizations or rebel groups;
- Of those exploited by individuals or enterprises, 4.5 million are victims of forced sexual exploitation;
- Forced labor in the private economy generates US \$150 billion in illegal profits per year;
- Domestic work, agriculture, construction, manufacturing and entertainment are among the sectors most concerned.

Legislation such as the UK Modern Slavery Act is spreading to ensure that private enterprises account for suppliers that may be using forced labor. Technology for human rights can perform a vital role by predicting areas where trafficking is likely to occur, tracing and tagging goods that are likely to have been produced by forced laborers, identifying perpetrators and bringing them to justice, and empowering individuals to protect themselves.

⁶⁰ <http://www.think-digital.eu/?n=2015/307>

⁶¹ <http://www.ilo.org/global/topics/forced-labour/lang--en/index.htm>

Using FinTech to Identify and Prosecute Human Trafficking

FinTech such as blockchain holds great potential to combat human trafficking. For example, the UN is partnering with the World Identity Network (WIN) to develop a blockchain identity pilot aimed to help curb child trafficking. Child trafficking uses fake identification documents to transport young people across borders for eventual forced participation in serious illicit activities including the sex trade, the illegal human organ trade, and others. Children under the age of five are often “invisible” to the state. They are often missed by social programs offered by governments or development agencies. Records of their identities may be poor or non-existent. The pilot will use blockchain to store digital identities which will provide a “significantly higher chance of catching traffickers.” Additionally, securing identity data on an immutable ledger will make trafficking attempts “more traceable and preventable.” Blockchain can potentially save “millions of children.”⁶²

Using Data Analysis to Identify and Prosecute Human Trafficking

Data analysis tools have become a vital resource to combat human trafficking as well. Spotlight is a web based tool that uses machine learning algorithms, connects disparate data sources, and integrates the field knowledge of law enforcement to search and analyze millions of records of escort and sex-worker related online advertisements. The tool enables law enforcement to conduct targeted searches and use AI to generate leads. Spotlight includes an image matching capability to identify relationships across ads that use the same images. Finally, the tool generates profiles including contact details and geographical coordinates. Spotlight has helped identify over 6,600 trafficking victims and reduced law enforcement investigative time by 44%.⁶³

Microsoft is helping to combat trafficking by offering its PhotoDNA Cloud Service for free to qualified organizations to automatically detect and report the distribution of child exploitation images. Known exploitation images (from trusted enforcement sources) are tagged with unique identifier codes so that similar images posted on the internet can be matched and brought to the attention of law enforcement.⁶⁴

The use and analysis of satellite images has also been successfully applied to a number of use cases. Satellites have an array of sensors onboard, some of which capture images of objects on the ground as small as a serving plate. DigitalGlobe, one of the world’s leading high resolution satellite imaging companies collaborated with the Associated Press to use satellite imagery to investigate human trafficking in Papua New Guinea.⁶⁵ Images combined with data analysis, were able to show the occurrence of trafficking among fishing boats in waters off of Papua New Guinea.⁶⁶

Digitalglobe analysts spotted a high-resolution shot of a ship matching the silver sea 2 right down to the docking ropes and open cargo holds, with boats identical to those from Benjina nestled alongside, apparently offloading fish.



The proof comes from accounts from recently returned slaves, satellite beacon tracking, government records, interviews with business insiders and fishing licenses.

The location is also confirmed in images from space taken by one of the world’s highest resolution satellites cameras, upon the AP’s request.

⁶² Sundararajan, Sujha, “UN Agencies Turn to Blockchain In Fight Against Child Trafficking” Coindesk, 13 November, 2017. https://www.coindesk.com/un-agencies-turn-to-blockchain-in-fight-against-child-trafficking/?utm_content=buffer79aec&utm_medium=social&utm_source=facebook.com&utm_campaign=buffer

⁶³ Sources: <http://assets.htspotlight.com/portal/Spotlight-Handout.pdf>; and <https://www.htspotlight.com/apps/>

⁶⁴ <https://www.microsoft.com/en-us/PhotoDNA/>

⁶⁵ Carr Center, 10.

⁶⁶ Carr Center, 10.

Using Data Collection to Identify and Prosecute Human Trafficking

Effective approaches to **data collection** are necessary to make the tools described above viable. For example, Alphabet (Google's parent company) has launched Jigsaw, "an incubator [...] that builds technology to tackle some of the toughest global security challenges facing the world today—from thwarting online censorship to mitigating the threats from digital attacks to countering violent extremism to protecting people from online harassment." Jigsaw focuses on:

- Ending repressive censorship;
- Fighting the rise of online mobs;
- Disrupting online radicalization and propaganda;
- Enabling transparency and accountability.⁶⁷

Jigsaw is working with anti-human trafficking organization Polaris Project to develop the Human Trafficking Hotline Network, "an international strategy for improving data collection on human trafficking to make it easier for aid organizations to share information."⁶⁸

Using Digital Networks to Identify, Prevent, and Prosecute Human Trafficking

Digital networks perform a vital role by enabling individuals to alert law enforcement and by arming those at risk with information and guidance to enhance their safety. For example, the free-to-download GPS-based app Red Light Traffic allows users to safely report suspicious activity to authorities. It also collects data to help authorities map problem areas and identify patterns. Users can send pictures, point out a problem area and answer questions from police discretely.⁶⁹

The Salesforce Foundation, Twilio, Polaris Project, and Thorn have collaborated on Be Free. Victims in the United States can send an SMS message to the "BeFree" shortcode for assistance 24 hours a day, 7 days a week, 365 days a year.⁷⁰

BT is partnering with Unseen to launch the UK's Modern Slavery Helpline and Resource Centre. It provides communication services, equipment and consultancy. The partners produced a short video on how to spot the signs of modern day slavery situations. Using the hashtag #Freetheunseen, it reached 2.8 million people through social media.

a3) Using Digital Solutions to Prevent Injustice and Corruption

Digital technology can be applied to combat a variety of forms of injustice and corruption.

Using Data Visualization to Build Awareness and Support the Prosecution of Injustice and Corruption

Concerning injustice, **data visualization** technologies are being used to disseminate powerful stories of human rights abuses to mass audiences, provoking empathy and spurring actions to reproach offending authorities. For example, Blindfold created a virtual reality experience that allowed users to explore Iran's infamous Evin Prison. The VR experience let viewers understand the experiences of prisoners on a deeper level, building empathy and encouraging involvement.⁷¹

⁶⁷ <https://jigsaw.google.com/vision/>

⁶⁸ <https://jigsaw.google.com/projects/#human-trafficking-hotline-network>

⁶⁹ <http://www.redlighttraffic.org/app/index.html>

⁷⁰ https://thenextweb.com/insider/2013/03/28/twilio-teams-with-polaris-project-to-launch-befree-text-shortcode-to-combat-human-trafficking/#.tnw_gzzAUQXF

⁷¹ Halvorssen, Thor, "What technology really means for human rights," The Memo, 16 October, 2017. <https://www.thememo.com/2017/10/16/what-technology-really-means-for-human-rights/>

Using Digital Networks to Reveal and Prevent Injustice and Corruption

Digital networks are being used to help reveal and thwart corruption. Jigsaw's Investigative Dashboard makes public documents (such as financial or property records) searchable and more useful for journalists investigating money laundering or corruption. The tool also allows researchers and journalists to work collaboratively, creating a platform for data-driven investigations."⁷²

The Indian website, I Paid a Bribe,⁷³ collates stories of bribes paid (or not paid) by citizens across the country. This crowdsourcing of reports makes it possible to track and publish trends in bribery and corruption. "I Paid a Bribe aims to clarify the role of bribery in public service delivery by transforming the data collected from citizen reports into knowledge that informs the government about gaps in public transactions and by strengthening citizen engagement to improve the quality of service delivery."⁷⁴

Using FinTech to Reveal and Prevent Injustice and Corruption

FinTech represents a potentially powerful tool against corruption. In 2011, corruption prevented 30% of all development assistance from reaching its final destination.⁷⁵ In that same year, OECD countries provided US \$135.5 billion in official development assistance, thereby risking as much as USD \$40.65 billion in losses. Box 6 describes how blockchain technology is being used to reduce these losses.

Box 6: Using Blockchain to Reduce Corruption

HiveOnline describes its blockchain program as follows:

"Aid for disaster relief and longer-term development programs[...] faces a huge logistical and reputational challenge.

Typical aid donation scenarios involve a donation in one currency, which is converted to a second currency by a global NGO, then another currency in-country and possibly further conversions as global distributors are used. Aid is also traditionally subject to significant "leakage", with funds and goods diverted to corrupt officials or, commonly, local people selling goods on the open market.

Donations to aid funds typically lose around 30% to multiple [foreign exchange] and transaction charges and poor terms from banks, while administration is high, and as it is very hard to trace funds[...]. Aid payouts often take place in challenging circumstances; recipients of aid are likely to be displaced, lacking access to formal identity or traditional financial services. Reducing interim stages such as merchants responsible for distribution, and ensuring end recipients benefit directly from the aid, is critical to reducing leakage.

Blockchain offers an opportunity to add transparency and confidence to donation pipelines, by creating an end to end audit trail of each transaction together with non-traditional identification techniques to ensure the correct recipients are benefitting, even if they lack formal identity or bank accounts.

Self-executing contracts offer the opportunity to automate much of the administration [...]. [A] hybrid solution where a technology platform, enabled by blockchain and automatically executing contracts, supports traditional actors in the aid lifecycle by reducing administration and increasing transparency [...] captures pre-determined recipients of aid, [and] provide[s] full transparency of financial interactions and the criteria validating the flow of value end to end, together with a reputation management system that evaluates the quality of performance.

The measurement and reputation system is combined with authentication such as biometrics, which can be managed outside traditional know your customer (KYC) scenarios, while the underlying cryptocurrency provides full traceability of transactions via blockchain technology.

Recipients can "cash out" the aid by triggering the self-executing contracts. For an end recipient, this may be in the form of food provided by a merchant, which is, for example, validated by biometric identity recognition while the contracts measure pre-set criteria. This reduces ambiguity and the risk of fraud and provides confidence for donors and NGOs alike.

The system manages the transfer of value, which can be created based on input of [US dollars] (for example) and released as local currency, minimizing exchange risk and providing full traceability for every transaction."⁷⁶

⁷² <https://jigsaw.google.com/projects/#project-shield>

⁷³ <http://www.ipaidabribe.com/#gsc.tab=0>

⁷⁴ Strom, Stephanie, "Web Sites Shine Light on Petty Bribery Worldwide," New York Times. 6 March, 2012. <https://www.nytimes.com/2012/03/07/business/web-sites-shine-light-on-petty-bribery-worldwide.html>

⁷⁵ del Castillo, Michael, "How Blockchain Could Finally Unite the United Nations" Coindesk, 9 May, 2017

⁷⁶ Blackstad, 2017

a4) Using Digital Solutions to Protect Safety and Security⁷⁷

Digital solutions can revolutionize how individuals survive threats in conflict zones and in instances of abuse. A variety of technologies can empower individuals to protect themselves and enhance the tools that human rights defenders can bring to bear. When people are harmed or displaced from their homes, smart phones, SIM cards, and global positioning apps help people find shelter, food, water, clothing, and medical services. Digital networks and data analytics can mobilize social service agencies to provide support that speeds a return to stability. Data collection and data analysis can support forensics that build evidence to bring perpetrators to justice. Box 7 provides an example of how Fujitsu is working to combine technology platforms to help reduce violence against women and children and reduce human trafficking.

Box 7: Fujitsu and Digital Innovation for Human Rights

"Fujitsu, co-creating with the Indonesian government department Kementerian Pemberdayaan Perempuan dan Perlindungan Anak (KPPPA), which translates as the Ministry of Womens' Empowerment and Child Protection have developed a solution to help with three key risk areas of concern. These being:

Ending violence against women and children

Ending human trafficking

Ending barriers to economic justice

[...] Fujitsu and KPPPA worked together to harness digital technology to deliver a solution which offered citizens the opportunity to report issues of abuse and human trafficking. The solution provides key data and insights to allow the government to continually improve and adapt their services for the protection of human rights. The citizens are enabled through a number of channels to fully facilitate anyone being able to report an issue, even for those who are not fully digitally included. These channels include:

A free to use telephony service

Via a smartphone application

Through a web portal

Direct/face to face through a government officer or via law enforcement

This solution is further enhanced through a news and social media tracker, which utilises AI. This allows Field Officers to proactively target major incidents as they happen. In combination with the citizens' data this gives the government significantly more insight into human rights issues and an authority to act quickly and with more knowledge to protect people.

[...] All of the reported incident data, the filtered news tracker information and the significant social media data is consolidated in a database. At that point data analytics are used to cross reference data, find trends and pull together recommendations for future improvements through the "Command Center".

Alongside this of course, government Field Officers and / or law enforcement are dispatched to deal with key, timely and critical issues."⁷⁸

⁷⁷ While not addressed directly in this section, a key area to monitor is how stakeholders can collaborate to determine how to eliminate forms of surveillance that clearly violate rights.

⁷⁸ Mel Melis, "Fujitsu and Digital Innovation for Human Rights" May 31, 2018. GeSI. <https://gesi.org/blog/detail/fujitsu-and-digital-innovation-for-human-rights>

Using data analysis to protect safety and security

Some emerging **data analysis** solutions are even utilizing AI/machine learning to help communities anticipate and escape threats to their well-being before they happen. For example, the University of Chicago's Centre for Data Science and Public Policy has developed a prototype algorithm to identify early warning signs that may predict adverse interactions between police and the public. Early tests have successfully identified officers who were later involved in adverse interactions with the public.⁷⁹

Atrocity Watch provides an early warning of precursors to genocide, war crimes, ethnic cleansing, and crimes against humanity through crowd sourcing and big-data analytics. Atrocity Watch leverages digital solutions such as social listening and cloud computing, to process massive amounts of data for indications of a human rights violation.⁸⁰ Jigsaw's Montage gives war crime investigators the tools to analyze vast amounts of YouTube footage and has been particularly effective in reviewing footage from conflict zones such as Syria.⁸¹

Digital networks, such as mobile phones, "Enable displaced people to: reconnect with family members and loved ones; access markets and make contacts to earn a living; increase safety and security (especially for women and girls); [and] transfer and receive cash."⁸²

They can also support social computation, engaging large numbers of volunteers to analyze data in ways that can anticipate risks before violations occur, or help support forensic assessments to help build cases against violators (see the earlier descriptions of Decode Darfur and Syria Tracker). "In both crowdsourcing inputs into an event monitoring platform and in crowdsourcing the analysis of an existing data set, digital networks leverage the scalability and low costs of digital networks."⁸³

When data analytics combine with digital networks, the potential of ICT to support safety and security grows even greater. Digital networks mobilize people to collect vital data. Analytic tools can then generate findings and use networks to distribute conclusions to human rights defenders, service providers, communities, and individuals who can take action.

In 2016, Amnesty International launched a report into mass graves found in Burundi based on satellite imagery backed up with social media eyewitness reports on the ground as well as from traditional interviews. Human Rights Watch has used content sourced from social media to highlight potential human rights abuses. WITNESS trained and encouraged activists to film potential human rights abuses.⁸⁴

Ushahidi uses crowdsourcing for "activist mapping", combining social activism, citizen journalism and geospatial data. A free and open-source platform, Ushahidi can help create a temporal and geospatial archive of events. The core platform allows the gathering of information from the general public during a crisis in near real-time. Companion products can be used to collect sensitive reports anonymously; inform citizens about information that could affect their rights and security; conduct trend analyses and visualize issues such as the threat of rising conflicts. Ushahidi has been used in several countries by citizens, media organizations, and social movements to document crises and protests.⁸⁵

Telia supports the research foundation Flowminder, which uses anonymized user data from Ncell's mobile network to analyze the displacement of people. Their reports are used in UN situation reports to facilitate relief efforts and have attracted significant interest from the aid community.⁸⁶

⁷⁹ Sandhu, Ajay, "The Police's Data Visibility – Part 1: How Data Can Be Used To Monitor Police Work and How It Could Be Used To Predict Fatal Force Incidents" 18 April, 2017, <https://www.hrbdt.ac.uk/the-polices-data-visibility-part-1-how-data-can-be-used-to-monitor-police-work-and-how-it-could-be-used-to-predict-fatal-force-incidents/>

⁸⁰ <http://www.atrocitywatch.org>

⁸¹ <https://jigsaw.google.com/projects/#montage>

⁸² Weidman-Grunewald, 2017

⁸³ Carr Center, 13

⁸⁴ Dubberley, Sam, "Using Technology to Facilitate Human Rights Work" 7 December, 2016, <https://www.hrbdt.ac.uk/using-technology-to-facilitate-human-rights-work/>

⁸⁵ <https://www.ushahidi.com/>

⁸⁶ www.flowminder.org

Telefonica combines real-time data sourced from the private sector with other existing public data sets relating to climate, UNICEF's Geographic Information System, and socioeconomic and epidemiological data. The "Magic Box" initiative enables UNICEF to optimize its response to public health emergencies and natural disasters – protecting children and saving lives in an increasingly unpredictable world.

Ericsson is the lead technology partner of Refugees United, a non-profit organization dedicated to helping displaced people locate and reconnect with missing family members and other loved ones via a mobile platform. By the end of 2016 there were more than 600,000 registered users on the Refugees United platform.⁸⁷

In Syria, the Red Cross has used Facebook posts to enable 140,000 to access clean water.⁸⁸

Using data visualization to protect safety and security

Adding in **imaging** and **visualization** technology into the mix can transform both security and forensic services. "Local activists armed with nothing more than a smartphone, a twitter account and a YouTube channel [can] become global distributors of information and images about human rights violations. The Syrian Observatory for Human Rights – a small NGO based in the UK – has become the most-cited organization for casualty figures in the Syrian conflict, a situation unimaginable even five years ago."⁸⁹

Satellite imagery, when combined with software analytics and machine learning and then distributed through digital networks is revolutionizing the capabilities of human rights defenders to map conflicts, violations, and displacement; analyze land use to determine if violations are occurring; employ change detection methodologies; monitor and catch violators in the act; solve undocumented crimes; and prepare evidence for courts. Satellite data have been used to:

- Document the massive destruction of civilian infrastructure in Syria;
- Document attacks against Muslim communities in Burma;
- Demonstrate forced resettlement ;
- Hold Seleka commanders in the Central African Republic to account for the destruction of dozens of villages;
- Show the expansion of North Korea's prison camps;
- Document mortar shelling of civilians;
- Find illegal gas flaring near rural communities;
- Track the destruction of villages by Boko Haram in northern Nigeria;
- Identify mass graves in Burundi;
- Document the destruction of villages in Iraq;
- File for lawsuits on behalf of communities devastated by actions taken by the Government of Zimbabwe;
- Document war crimes in Darfur.⁹⁰

⁸⁷ Johnson, Heather, "Making it real – ICT and the SDGs," Ericsson, 18 September, 2017. https://www.ericsson.com/thecompany/sustainability_corporateresponsibility/technology-for-good- blog/2017/09/18/making-it-real-ict-and-the-sdgs/

⁸⁸ Hackel, Joyce, "In Aleppo, cell phones are helping some desperate Syrians find clean water," PRI, 26 August, 2015, <https://www.pri.org/stories/2015-08-26/aleppo-cell-phones-are-helping-some-desperate-syrians-find-clean- water>

⁸⁹ Levine, 2014

⁹⁰ Carr Center, 10, 26, 27.

Using data security tools

Protecting the security of individuals and communities increasingly relies on **data security** tools. For example, the International Bar Association (IBA) has launched the eyeWitness app to document and report human rights atrocities in a secure and verifiable way, so the information can be used as evidence in a court of law. Using an Android-enabled smart phone, anyone, can use the eyeWitness to Atrocities app to help hold accountable the perpetrators of genocide, crimes against humanity, torture, and war crimes. "When a user records an atrocity, the app automatically collects and embeds into the video file GPS coordinates, date and time, device sensor data and surrounding objects, such as Bluetooth and Wi-Fi networks. The user has the option of adding any additional identifying information about the image. This metadata will provide information integral to verifying and contextualising the footage. The images and accompanying data are encrypted and securely stored within the app. The app also embeds a chain of custody record to verify that the footage has not been edited or digitally manipulated. The user then submits this information directly from the app to a database maintained by the eyeWitness organization. Once the video is transmitted, it is stored in a secure repository that functions as a virtual evidence locker safeguarding the original, encrypted footage for future investigations and legal proceedings. The submitted footage is only accessible by a group of legal experts at eyeWitness who will analyze the footage and identify the appropriate authorities, including international, regional or national courts, to pursue relevant cases."⁹¹

The Oslo Freedom Forum has conceived the app Whistler which uses end-to-end encryption, two-factor authentication, free VPNs, and more to give activists "the tools to take advantage of technology's potential while avoiding its drawbacks."⁹²

Using data collection and management to protect safety and security

Data collection and management underpin the ability of digital solutions to support safety and security. For example, Uwazi is a tool to enable human rights defenders to store, organize, search, and access a variety of documents that are not easily catalogued, tagged and searched. Examples include government budgets, UN Human Rights Council member voting records, and human rights case law to name a few. A web-based platform, Uwazi allows users to work directly with the text inside these otherwise uneditable documents to add new layers of information and organization.⁹³

Sithi, which means 'rights' in Khmer, is "the first Cambodian human rights portal that aims to create a single map-based database of reports of human rights violations with contributions from human rights activists, organizations, and regular citizens from across the country. Registered users can submit reports under a variety of sub-categories including judicial fairness, land tenure, and freedom of expression."⁹⁴

b) Civil-political human rights related to individual, civic, and political liberties and empowerments

b1) Using Digital Solutions to Support Labor Rights and Responsible Supply Chain Practices

Labor rights guarantee humane working conditions such as avoidance of physical or other debilitating abuse and harassment, strenuous work that damages health, limits on the length of the work day, safe working conditions, allowance for breaks, fair wages, a prohibition on child labor, and more. This year, the number of countries in which workers were exposed to physical violence and threats increased by 10% (from 52 to 59 countries).⁹⁵

Protecting workers from violations, and remedying violations that do occur, has traditionally relied on human investigations and monitoring. This is time consuming, expensive, and can be subject to fraud. A number of organizations are piloting creative digital solutions to address labor rights.

⁹¹ http://www.futuretimeline.net/blog/2015/06/8-2.htm#.WQic_vnys54

⁹² Halvorssen, 2017

⁹³ <https://www.uwazi.io/>

⁹⁴ <http://sithi.org/index.php?url=violation.php>; <http://transparency.globalvoicesonline.org/project/sithi>

Using data analysis and visualization to support labor rights and responsible supply chain practices

The award-winning Sourcemap combines data **analysis and visualization** to provide industry-wide assurance of sustainability and compliance across the extended supply chain. The site compiles data from buyers and suppliers which is independently verified by machine learning algorithms and independent auditors. The site produces clear analyses that identify risks, predict trouble spots, and highlight non-compliant suppliers and their progress in remedying workplace issues.⁹⁶

Cisco is applying AI to address labor rights in the supply chain, as described in Box 8.

Box 8: Cisco's use of AI to support labor rights

"At Cisco, we believe AI can be a powerful tool in the supply chain's efforts to drive social and environmental responsibility (SER) improvements within our manufacturing operations. For example, using AI and next generation collaboration tools, like Cisco's Webex Teams, our Supply Chain Operations team is developing technology to identify and address potential SER issues and provide actionable intelligence to drive the necessary corrective actions. This digital platform will ultimately translate across language, cultural and physical barriers and link auditors, Cisco, and our suppliers so that we may more effectively address corrective action plans (CAPs) for SER audits. Through our "CapBot" technology, our goal is to identify risks and vulnerabilities within factory lines. As the AI technology learns and adapts, it can

inform decisions that drive real-time continuous improvements. The CapBot simplifies and automates routine tasks such as manual data collection, and it also ensures that supplier responsibility extends beyond compliance. The increasing adoption of AI to automate many transactions in the audit process will enable brands like Cisco to focus on continuous improvement activities that can be machine aided over time. For example, surveys and trainings connected to audit findings can be sent over the platform with real-time click tracking mechanisms to ensure completion and test understanding. As our CapBot program expands, we expect to be able to develop metrics that will more accurately gauge the performance of our suppliers, which will help us to better assess risk and deploy appropriate resources."⁹⁷

Using Fintech to support labor rights and responsible supply chain practices

FinTech applications such as blockchain are being used creatively across multiple use cases for labor rights.

For example, the Coca-Cola Company and the U.S. State Department are launching a project using blockchain's digital ledger technology to create a secure registry for workers that will help fight the use of forced labor worldwide. The project will create a secure registry for workers and their contracts using blockchain's validation and digital notary capabilities.⁹⁸

The organization Provenance is building a traceability system and open traceability protocol that anyone can use to track whether or not any good, "from coffee beans to a roll of fabric," has been sourced ethically. Provenance is using blockchain technology to trace yellowfin and skipjack tuna fish in Indonesia from catch to consumer. "Mobile, blockchain technology and smart tagging were used to track fish caught by fishermen with verified social sustainability claims. The goal was to aid robust proof of compliance to standards at origin and along the chain [...]. The pilot was successful in tracking responsibly-caught fish and key social claims down the chain to export." The Provenance application works through a simple smartphone interface and links identity, location, material attributes, certifications and audit information with a specific item or batch ID. The data is stored in an immutable, decentralized, globally-auditable format which protects identities by default, allowing for secure data verification.⁹⁹

⁹⁵ <https://www.ituc-csi.org/ituc-global-rights-index-2017-18767>

⁹⁶ Green Electronics Council, "Sourcemap, Xerox Win the 2017 GEC Catalyst Awards" 8 June, 2017. <http://greenelectronicscouncil.org/xerox-sourcemap-win-green-electronic-councils-2017-gec-catalyst-awards/>

⁹⁷ Unni Nair, "AI as a Force for Good in Supply Chain Management," April 2018, <http://scnavigator.avnet.com/article/april-2018/ai-as-a-force-for-good-in-supply-chain-management/>

⁹⁸ Gertrude Chavez-Dreyfuss, "Coca-Cola, U.S. State Dept to use blockchain to combat forced labor," Reuters. 16 March, 2018. <https://www.reuters.com/article/us-blockchain-coca-cola-labor/coca-cola-u-s-state-dept-to-use-blockchain-to-combat-forced-labor-idUSKCN1GS2PY>

⁹⁹ https://www.provenance.org/tracking_tuna_on_the_blockchain#overview

Using digital networks to support labor rights and responsible supply chain practices

Digital networks, such as the previously described LaborLink and LaborVoices, can be effectively deployed as well. For example, KamakoChhnoeum in Cambodia is a program that uses mobile and fixed landlines to enable workers to receive audio messages that educate them on their rights. The system uses keypad surveys that inform authorities of working conditions and potential violations. Within the first two months of the program, 3,245 workers phoned KamakoChhnoeum.¹⁰⁰

The JORNALER@ app helps protect the wages of day laborers from theft, corruption, or willful underpayment by employers. The app helps workers keep track of their hours, wages, work location, breaks, as well as employer and worksite information. The app collects the data and creates a "Job Log" for the user that displays weekly and annual wages, as well as a monthly average wage for jobs in the area. JORNALER@ collects the necessary information to properly document and to begin a wage theft complaint that can eventually be delivered directly to the Department of Labor.¹⁰¹

b2) Using Digital Solutions to Protect Land rights and Identity

As noted earlier, 2.5 billion people lack formal title to their homes. Adding to this challenge, the UN estimates that 4 billion people lack a reliable way to address their homes. This is likely due to a combination of weak governance and administration services along with corruption. Without land rights, individuals live in constant threat that their homes, farms, and property will be taken away. Land is crucial to enabling people to access their right to participate in development.

Those without an address lack a tool to establish their identity that many take for granted. They can be denied essential social services as, "[t]hey struggle to open bank accounts, register a birth or access electricity or water supplies. Without the ability to communicate where they live, these people become invisible to the state."¹⁰³

Using inter-operability to protect land rights and identity

A combination of creative forms of **data collection**, **digital networks**, and **data analysis** that utilize GPS, cloud computing, and imaginative tagging approaches are helping to address the problem.

USAID is piloting an innovative program called Mobile Applications to Secure Tenure (MAST). MAST developed an easy-to-use, open-source smartphone application that can capture the information needed to issue formal documentation of land rights. The project combines relatively inexpensive and readily available mobile technologies (e.g., GPS/GNSS-enabled smart phones and tablets) coupled with crowdsourced data collection methods in rural and underserved settings. The project trains staff from civil society organizations along with community members to use MAST's technology to collect land rights and tenure information. A cloud-based data management system stores geospatial and demographic information. MAST has the potential to lower the costs and time involved in registering land rights and make the process more transparent and accessible to local people. Initial results from Tanzania suggest that MAST had a significant impact on women's land rights in the villages in which it worked.¹⁰⁴

¹⁰⁰ <https://iloblog.org/2013/12/12/mobile-phones-for-labour-rights/>

¹⁰¹ <https://www.ilr.cornell.edu/worker-institute/new-york-state-projects/jornaler-app-grow-knowledge-build-community-end-wage-theft>

¹⁰² what3words.com

¹⁰³ what3words.com

¹⁰⁴ https://www.land-links.org/wp-content/uploads/2017/01/USAID_Land_Tenure_MAST_Final_Report_Nov_2016.pdf

Initiatives such as “what3words” and “Blue Number” are tackling the challenges of defining addresses and thereby helping to establish individual identities. What3words uses geospatial mapping technology with analytic software to divide the world into a grid of 3m x 3m squares. Each square receives a unique three word address (such as table.lamp.spoon). What3words has been applied in South Africa to provide the three word addresses to individuals whose homes had previously been undocumented. Using the three word address, CSOs and government agencies have been able to provide improved medical services, supply emergency transport for women in labor, map the location of clinics and health facilities, and identify hot spots for human rights abuses.¹⁰⁵ What3words is adding to its potential impact through a partnership with Bluenumber (see Box 9).

In addition, telecommunications companies are supporting efforts in Africa to expand birth registrations. Registration is key to enable individuals to obtain education and health care. Registration is an important tool to protect individuals from trafficking and to help enforce land rights.

Box 9: Using Technology for human rights to Establish Identity

“Bluenumbers let people announce their existence and own their data on a global public registry. This free service is helping to build an open, public resource – called BlueView – for everyone by everyone. BlueView searches have been enhanced through what3words integration, allowing users to associate their unique Bluenumber to an equally unique 3 word address.

The ability to define who you are and where you are is a fundamental factor to reducing inequality around the world and achieving several of the UN’s Global Goals for Sustainable Development (SDGs). The collaboration between what3words and Bluenumber will help to measure the progress of

SDGs at an individual level. By providing a more accurate picture of where people are in the world – via the precision of a 3 word address – governments, businesses, NGOs and local communities can develop more effective policies and solutions to deliver the SDGs.

One use of Bluenumbers is in identifying specific people at specific places, to help highlight the previously ‘invisible’ stages of a supply chain process. Now any farmer, garment maker, wholesale stockist or reseller can be identified with a Bluenumber, enabling them to be both accountable for their work and voluntarily benchmarked on their performance.”¹⁰⁶

b3) Using Digital Solutions to Protect Privacy and Freedom of Expression

As the internet, mobile, and other forms of communication advance, so too have efforts by states and other actors to compromise privacy, data security, and freedom of expression. For example, tactics commonly employed in the top 10 most censored countries include:

- Restrictions on content;
- Firewalls to block access to certain internet sites;
- Limited access to the internet ;
- Threats of imprisonment or other penalties.^{107 108}

The ICT industry has been called by a variety of stakeholders to take action by setting policies, processes, and safeguards related to privacy and freedom of expression (PFOE). Companies have started to document their PFOE practices, incidents, and performance in Transparency Reports. Multi-stakeholder initiatives have formed to discuss common rules of the road regarding, to cite one example, how to respond to users and business partners that misuse products and services and violate PFOE.

In addition, ICT companies along with social enterprises are innovating digital solutions to help private citizens, human rights defenders, and institutions protect their data and their PFOE.

¹⁰⁵ <https://what3words.com/partner/gatewayhealth/>

¹⁰⁶ <https://what3words.com/partner/bluenumber/>

¹⁰⁷ <https://cpj.org/2015/04/10-most-censored-countries.php>

¹⁰⁸ <https://www.theguardian.com/technology/datablog/2012/apr/16/internet-censorship-country-list>

Using data security to protect privacy and freedom of expression

A number of organizations are developing **data security** solutions utilizing a variety of approaches such as encryption, machine learning powered surveillance and alerts, analytic software to find spying malware, and the design of secure networks such as secure cloud storage.

Deutsche Telekom and the Fraunhofer Institute for Secure Information Technology (SIT) are launching Volksverschlüsselung, a simple and free e-mail encryption service. Their goal is to make state-of-the-art encryption methods accessible to everyone. Deutsche Telekom operates the service at a high-security data center. Cryptographic keys are created directly on the user's end device and never leave their device, making sure that they are never available to the infrastructure operator.

The social R&D enterprise, Benetech has led a consortium to develop Martus, a free, open source software platform featuring strong encryption and cloud storage to gather and protect sensitive data. Martus provides security to human rights defenders as they collect data, store it, transmit it, and develop forensic analysis. The platform has been used to support the development of three reports documenting human rights violations. One example is the "Uganda Report of Violations Based on Gender Identity and Sexual Orientation" that verifies over 250 human rights violations including denial of access to legal counsel, arbitrary arrest, forced testing for HIV and other sexually transmitted diseases, forced eviction, and denial of employment.¹⁰⁹

Jigsaw is developing a number of data security tools. Its Project Shield uses Google's infrastructure to protect those that publish human rights information from ferocious distributed denial of service attacks (DDoS). This digital attack exploits thousands or even millions of computers to overwhelm a website's servers and take it offline.¹¹⁰

Using digital networks to protect privacy and freedom of expression

Digital networks can also serve to protect PFOE. uProxy, seeded by Jigsaw and owned by the University of Washington, provides access to the "free and open internet by letting anyone who lives in a repressive society share the connection of someone who lives in a country with open internet access. uProxy works on an internet browser, with the option to set up a cloud server to provide constant access to the open internet."¹¹¹ Jigsaw also supports Unfiltered.News. Using the Google news corpus, the solution brings to light unseen censorship by mapping important news stories that have gone uncovered in a country and allow internet users to discover which stories are being covered in certain locations, how different countries cover stories differently, and how issue coverage changes over time.¹¹²

b4) Using Digital Solutions to Strengthen the Rights of Citizenship

Citizens become vulnerable when governments, businesses, and other institutions do not respond or address their legitimate concerns and needs. Digital solutions can help strengthen the rights of citizenship by ensuring government and institutional actions remain transparent, accountable, and responsive. Citizens can use technology to monitor the distribution of public budgets, the allocation of services, the responsiveness to requests to address faults (such as crumbling infrastructure and impassable roads), policies that unfairly disadvantage certain groups, corruption, and violations of rights. Digital solutions can go beyond monitoring to enable dialogue between citizens and those in power. It can also empower citizens to conduct their own analysis to prove where governments and institutions are falling short on their obligations.

These digital solutions are sometimes labeled "civic tech." Some of the most promising examples create inter-operability across digital networks, data analysis and visualization, and data collection and management solutions among others.

¹⁰⁹ <https://benetech.org/story/martus-human-rights-documentation/>

¹¹⁰ <https://jigsaw.google.com/projects/#project-shield>

¹¹¹ <https://jigsaw.google.com/projects/#project-shield>

¹¹² <https://jigsaw.google.com/projects/#project-shield>

Using civic tech to enable citizens to ensure fair and just government budgeting processes

A growing application of civic tech is for **participatory budgeting** (PB) in which involves citizens in the budget allocation process and in the monitoring of public spending. As many as 2,500 local governments around the world have experimented with PB, from major cities such as New York, Paris, Sevilla, and Lima, to small and medium cities in countries as diverse as Poland, South Korea, India, Bangladesh, and the Democratic Republic of Congo. Participatory budgeting has been associated with desirable outcomes such as increases in tax revenue, improved service delivery, and reduced infant mortality.

Digital solutions are increasingly applied to participatory budgeting. Brazil, and its cities of Porto Alegre and Ipatinga, were among the early adopters of technology. Digital solutions have disseminated across the country. For example, “the participation level from Rio Grande do Sul is, in itself, impressive. In 2014, over 1.3 million people took part in the process, corresponding to 15 percent of the total population in the state of voting age. This makes Rio Grande do Sul’s PB project one of the largest participatory governance processes supported by digital technology.”¹¹³ Box 10 describes a participatory budgeting success in the Democratic Republic of the Congo (DRC).

Box 10: Applying Digital Solutions to Enhance Participatory Budgeting

“The World Bank Institute’s ICT4Kivu Project in the province of South-Kivu, DRC, brought together actors from civil society, the private sector, and local and provincial governments, using Information Communication Technology (ICT) as a means to facilitate participatory budgeting at the local level. ICT has played an important role in engaging the wider community in South-Kivu.

A mobile network covers most of South-Kivu, and cheap mobile phones are easily available and commonly used. The ODTA-ICT4Gov Program has formed a partnership with Airtel, DRC’s largest mobile operator. Airtel provides information about users’ geographic location, allowing SMS messages to be sent to users in a specific community to inform them of communal budget meetings and decisions. A remote voting system via SMS enables citizens to vote on a list of budget priorities compiled during open district meetings.

As a result of the ICT-mediated participatory budgeting process in South Kivu in 2011, tax collection increased up to 16-fold in participating local communities as citizens saw that projects started to be implemented, and the provincial government increased transfers of funds to local governments up to four-fold as it saw a more legitimate process to elaborate the budget. The mobilization of additional resources for services for the poor can be seen as an indication of increased trust that was built between local Governments and citizens and local Governments and the provincial Governments.

In October 2012, the provincial government passed a law to institutionalize participatory budgeting, and other provinces are following suit and starting to replicate the process. Facilitated by ODTA-ICT4Gov, this approach is now also being replicated in Cameroon. All of these improvements have encouraged local public investment, which was until recently an elusive goal in this fragile region.”¹¹⁴

Using civic tech to encourage governments and businesses to respond to citizen complaints, concerns, and needs

Another promising example of civic tech is encouraging governments to **respond to citizen complaints, concerns, and needs**. For example, the non-profit Instituto Prensa y Sociedad and several online news outlets, used the Ushahidi technology described earlier to form Guachimán Electoral, or “election watchman.” This crowdsourcing platform collects and maps citizen complaints. Witnesses to irregularities — from the use of government funds to promote candidates to election-related violence — can report them on the Guachimán’s website, or via text message, Twitter or WhatsApp.¹¹⁵

¹¹³ Civic Tech, 40-42

¹¹⁴ <https://saeguide.worldbank.org/sites/worldbank.org.saeguide/files/documents/ICT%20AFR%20South%20Kivu%20.pdf>; <https://saeguide.worldbank.org/information-communication-technologies-icts>

¹¹⁵ Sources: <http://qz.com/563895/technology-developed-in-africa-is-helping-venezuelans-keep-their-election-fair/> <http://technologyandhumanrights.org/technology-developed-in-africa-is-helping-venezuelans-keep-their-election-fair/>

Public water services have been especially keen to adopt digital solutions. For instance:

*"Officially launched in Kenya in 2014, MajiVoice is an integrated solution that facilitates the submission and handling of complaints by water services customers. Beyond the traditional walk-in centers, MajiVoice enables customers to report problems via telephone hotlines, SMS, social media, and a dedicated online platform. Once reports are submitted, a web-based task management solution assists water providers to process and handle the complaints received following clearly defined workflows. Customers, in turn, can track the status of their reports via a unique identifier number, and are notified once their issue is resolved [...]. Since its implementation, the number of complaints recorded has risen by a factor of ten, from 400 reports per month to 4,000 reports. Resolution rates have increased from 46 percent to 94 percent, and average resolution time has been reduced by half [...]. [O]ne essential reason for MajiVoice's improvement on performance is the web-based task management solution that improves the capacity of water service providers to process and handle complaints, while reinforcing the capacity of the government to monitor the performance of these same providers."*¹¹⁶

The Human Sensor Web, an initiative supported by Google.org and UN-Habitat, allow citizens to report 'no water' or 'bad water' via SMS to the Zanzibar Water Authority.¹¹⁷

Businesses and their stakeholders benefit from civic tech as well. Increasingly, companies are held to account for the way their operations, products, decisions, and behavior affect the well-being of communities and employees. Digital solutions designed to support labor rights and responsible supply chain practices such as LaborLink and LaborVoices have been described above. Mining giant AngloAmerican provides an example of community engagement in Box 11.

Box 11: Using Digital Solutions to Improve Corporate-Community Relations

In partnership with Australia's Commonwealth Scientific Industrial Research Organisation and technology from Vodafone, Anglo America deployed a pilot program – Perception Surveys – to actively monitor stakeholder attitudes. The surveys are deployed using low-cost mobile phone technology to gather real-time community perception. The survey data is used in conjunction with other data sets (such as face-to-face engagement outcomes, complaints and grievance data, media monitoring, etc.) to better understand community perceptions and inform the company's response to concerns.

The pilot launched in five sites and engaged 450 participants. The surveys provided insight into community experiences with the mines, Anglo America's relationship with neighboring communities, and levels of trust and acceptance, rated on five-point and seven-point scales. Thereafter, the participants receive a monthly text message survey consisting of five questions, over a 12-month period. Across all the sites, preliminary findings indicate that quality of engagement and being treated fairly are key drivers of trust.¹¹⁸

c) Socio-economic human rights

c1) Using Digital Solutions to Enable Access to Resources Essential for Development

The UN Declaration on the Right to Development states, everyone is "entitled to participate in, contribute to, and enjoy economic, social, cultural and political development, in which all human rights and fundamental freedoms can be fully realized."¹¹⁹

¹¹⁶ Civic Tech 37-38, 39

¹¹⁷ Civic Tech, 37

¹¹⁸ Anglo America Sustainability Report, 2015, P. 38 - <http://www.angloamerican.com/~media/Files/A/Anglo-American-PLC-V2/documents/aa-sdreport-2015.pdf>

¹¹⁹ <http://www.un.org/documents/ga/res/41/a41r128.htm>

The SDGs reference these rights as they set goals to:

- End poverty in all forms everywhere (SDG 1);
- End hunger, achieve food security and improved nutrition and promote sustainable agriculture (SDG 2);
- Ensure healthy lives and promote well-being for all at all ages (SDG 3);
- Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all (SDG 4);
- Achieve gender equality and empower all women and girls (SDG 5);
- Ensure availability and sustainable management of water and sanitation for all (SDG 6);
- Ensure access to affordable, reliable, sustainable and modern energy for all (SDG 7);
- Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all (SDG 8);
- Reduce inequality within and among countries (SDG 10);
- Make cities and human settlements inclusive, safe, resilient and sustainable (SDG 11);
- Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels (SDG 16).

Recent research conducted by GeSI finds that digital solutions are indispensable to achieve these goals. The advance of the ICT industry and its products and services will uplift development by providing access to commerce, communities, civic engagement, and essential services in a way that is affordable and inclusive.¹²⁰ GeSI finds that at the present rate of technology adoption, ICT could help reduce poverty by one-third.¹²¹ It projects that 1.6 billion people will benefit from the provision of e-healthcare.¹²²

The continued development and application of technology in support of human rights have the potential to expand and accelerate the ability of individuals to access their right to participate in development.

Using digital networks to support access to development

In this regard, **digital networks** have tremendous potential. Broadband, mobile, and other communication infrastructure give rise to platforms that enable individuals to connect with each other, and gain access to the highest quality forms of education, medical advice, and job training. Digital network technology empowers individuals to prevent opportunists from exploiting imbalances in information. For example, smart phones have enabled small farmers to negotiate prices directly with buyers and avoid unscrupulous middle-men. Digital communities are being used in increasingly imaginative ways to establish trust that allows financial institutions to establish a credit-rating and provide capital to those previously unbanked. Box 12 outlines the potential for digital networks to support access to education and health.

¹²⁰ http://www.huffingtonpost.com/entry/silicon-valley-accessibility-people-with-disabilities_us_55b23b15e4b0224d8831d789

¹²¹ GeSI, 2016.

¹²² GeSI, 2016, P. 4-5.

Box 12: The Ability of Digital Networks to Enable Access to Education and Health

Using digital solutions to promote access to education:

"Concepts like remote learning and digital classrooms have been instrumental in taking education to the remotest corners; [...] these concepts continue to evolve. Moreover, falling smartphone prices and easy access to [the] internet have brought about a sea change in the way students interact with subjects. Evidence indicates that basic computer training programmes, retail management skills and proficiency in spoken and written English can substantially improve the chances of young people finding a job. Girls and boys get a foothold in their journey of lifelong learning by being enrolled in simple programmes which expose them to technology."

For example, Verizon's subsidiary Oath provides training for girls in Rwanda to develop software coding skills. Verizon's Innovative Learning Schools initiative provides schools with next-gen technology and tech-infused curricula that are hands-on, immersive, and that innovate the way teachers teach and students learn, preparing students for the tech-dependent jobs of the future.

Using digital solutions to promote access to health:

"ICT does not only benefit medical practitioners in remote areas through the exchange of information between primary

and specialty care health professionals, but also enables them to obtain a second opinion to help with diagnosis. This helps in strengthening cooperation between health professionals and improves coordination. It can also improve the quality of healthcare and reduce costs and unnecessary travel for patients. For example, [Ericsson's] Device Connection Platform, which runs solutions that simplifies insulin-treated diabetes by gathering and sharing data between patient and healthcare professional through a unified connected device [...]. The introduction of 5G with ultra-low latency of a few milliseconds and multi gigabit bandwidth will enable reliable communication that has the ability to perform mission critical procedures. Let's take remote surgery – to operate safely a surgeon needs to be able to react to physical and visual stimuli in under 10 milliseconds. When operating remotely, these stimuli will need to be delivered over a network, but the time required to compress and decompress video content vastly exceeds the safe reaction time. With 5G supporting the solution, these problems are neatly sidestepped. 5G connectivity enables much greater bandwidth usage, while intelligent network slicing separates and prioritizes mission-critical functions, such as machine communication, which is required for the surgery. Most importantly, the low-latency attributes of 5G means the haptic feedback is felt in near real-time through the surgeon's gloves."¹²³

For example, BT is partnering with the Novartis Foundation to enable community healthcare workers in rural Ghana to get expert advice from doctors to help their patients. A new telehealth centre is helping to expand access to quality healthcare in remote areas by cutting down transport times and costs for patients, and avoiding unnecessary referrals. During the pilot phase, hospital referrals have fallen by 37% – which could save the Ghana Health Service over £2 billion per year.

In the area of education, a public-private collaboration between the Earth Institute at Columbia University, Ericsson, and Millennium Promise have formed Connect to Learn. The program focuses on the 50% of children living in conflict zones that are unable to attend school. For example, by 2013, two years after the Syrian civil war started – about 1.8 million children and adolescents were out of school, many of them living in refugee camps in neighboring countries such as Iraq. Connect to Learn delivers a 21st century ICT learning cloud solution from Ericsson that empowers teachers and gives students access to global resources. The Connect to Learn solution has been employed in several refugee camps in northern Iraq, and has provided the children of refugees and the displaced people who live there with free access to a good quality education. Partners such as the IRC purchase equipment and train teachers. The local telecommunications operator, AsiaCell, provides equipment and data packages, and Ericsson delivers the technical solutions (including cloud-managed software) and remote support. To date Connect to Learn has been provided to 10 schools in refugee camps in northern Iraq, impacting more than 6,700 students and 100 teachers. Across the world, Connect to Learn currently benefits more than 80,000 students in 23 countries.¹²⁴

¹²³ Bansal, Nitin, "How New Tech is Transforming Health and Education in India," Ericsson, 5 October, 2017. https://www.ericsson.com/thecompany/sustainability_corporateresponsibility/technology-for-good-blog/2017/10/05/how-new-tech-is-transforming-health-and-education-in-india/

¹²⁴ Sources: Johnson, 2017; Yermiche, Zohra, "Focus on education in emergencies and crises at Mobile Learning Week 2017" Ericsson, https://www.ericsson.com/thecompany/sustainability_corporateresponsibility/technology-for-good-blog/2017/03/22/4339/

Using data analysis and visualization to promote access to development

Along with digital networks, digital technologies that support **data analysis and visualization** can enable individuals to access their right to participate in development. Analytic software can gather and interpret volumes of information that allow humanitarian service providers to diagnosis needs, root causes, and pinpoint solutions and services. For example, Verizon, in partnership with the Children's National Medical Center used its technology to help screen more than 6,000 children in rural Brazil for a fatal heart condition. More than 300 were diagnosed to receive treatment. In Syria, the technology for human rights "Syria Tracker" found that approximately 23,000 children had been left unvaccinated for critical diseases. Syria Tracker's analysis led Save the Children to return to the region to provide needed inoculations.¹²⁵

Data analytics can empower individuals as well. In Uganda "giving mothers in rural villages data on public health and data on the resources that the government was allocating for rural health led to a drop in infant mortality by a third, compared to control villages where this was not done. Mothers became more assertive about ensuring their children receive the inoculations they were entitled to, and about expecting healthcare workers to turn up when they were supposed to."¹²⁶

The remote sensing capabilities that underpin IoT could revolutionize the ability of individuals, governments, and humanitarian agencies to provide on-demand development solutions. For example, clean and healthy water is a basic human right. Ericsson is participating in a partnership to develop a real-time water monitoring solution to measure and understand the quality of water. Partners include City of Stockholm, the Stockholm Water company, the Royal Institute of Technology, Stockholm University, Linköping University, and Telia Company. The partnership has connected the first sensors in Stockholm that are retrieving data that will be analyzed using algorithms that provide predictive analytics and early warning functionalities. Sensors will monitor pollution flows and bacterial contamination so that water quality can be assured. In the future, a digitalized solution will provide real time, concurrent knowledge of water status; minimize the need for time-consuming manual sampling and lab testing; and give water utilities and cities a tool to minimize their lead times, take informed decisions and thus continue to secure access to clean and healthy water. "The water monitoring solution we are developing will be a future tool for cities and water utilities around the globe. By knowing the status of the water in real time, cities will be able to take measures if any pollution is detected and we as citizens can continue to enjoy safe water."¹²⁷

d) Collective developmental rights

Samsung's Relúmíno provides an example of ICT's support for collective development rights. Relúmíno, meaning "Light up again", is an innovative visual aid application that works in conjunction with the Gear Virtual Reality (VR) created by Samsung's C-Lab to enhance vision for people with low vision. C-lab members discovered that only 14% (36 million) of the visually impaired are totally blind. The remaining 86% (217 million) have 'low vision' and are able to determine the difference between light and dark." Samsung's Relúmíno processes images from videos projected through the rear camera of a smartphone and makes the images visually-impaired-friendly. More specifically, its major features include magnifying and minimizing image; highlighting the image outline; adjusting color contrast and brightness; reversing color; and screen color filtering. The end effect is that 'Relúmíno' enables visually challenged people to see images clearer when they are reading a book or viewing an object. Relúmíno users can set application settings based on their specific needs. Then the application can automatically place the image that is missing from the user's sight and remap it to the user's visible range.¹²⁸

In addition, the International Telecommunications Union (ITU) has developed since 2004 a Capacity building Programme enabling indigenous people to use ICT as a tool to leverage their social and economic community development and to promote, preserve and protect their indigenous culture.¹²⁹

¹²⁵ Carr Center, 45

¹²⁶ Daniel Marciniak and Vivian Ng, "Data for Social Change | An Interview with Andrew Stott," 13 February, 2017. <https://www.hrbdt.ac.uk/data-for-social-change-an-interview-with-andrew-stott/>

¹²⁷ Paska, Daniel, "Working Toward Clean Water for All," Ericsson, https://www.ericsson.com/thecompany/sustainability_corporateresponsibility/technology-for-good-blog/2017/06/30/4512/

¹²⁸ Source: Interview with Samsung Executive, May 2018.

¹²⁹ http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/SC/pdf/UNESCO-LINKS_IPs-ICTs.pdf



VI. Overcoming Challenges

For technology for human rights to reach its potential, the ICT industry, human rights defenders and supportive stakeholders will need to collaborate to address key challenges that pose risks to the effective deployment of digital solutions, and to address core needs that will make digital solutions more impactful.

Accelerate digital access and connectivity

Connectivity to mobile broadband underpins every digital solution one can apply to human rights. Connectivity powers the design of the innovative, inter-operable solutions that are being deployed to support rights. Connectivity also enables the delivery of digital solutions used to support specific individuals as well as whole communities. One should also not take for granted that access to communication often starts the process of defending rights as it allows individuals to call for help.

Currently four billion people lack access to the internet.¹³⁰ One billion lack a mobile phone.¹³¹ Connectivity rates significantly vary within countries due to a range of factors, such as safety, security, permitting, supportive infrastructure, and lack of skilled workforce. High poverty inner cities and rural areas are often the last places to become connected. Because not all of these factors are within the domain or expertise of the ICT sector to address, collaboration is vital to remove economic, political, and social barriers that inhibit greater access to communication platforms.

Advance R&D leading to innovative technology for human rights

While exceptions exist, technology for human rights lacks the infrastructure and resources that help drive other forms of innovation. Expanding financial and human resources to support R&D is a priority. In addition, innovation thrives as a “contact sport” where individuals with a variety of backgrounds, interests, and perspectives can connect to spark creativity.

R&D for technology for human rights also has unique requirements. The process of innovation requires trial and error and a tolerance for failure. Yet for those defending human rights, failure is not an option. There is a need to create collaborative spaces that attract resources and allow the capability for experimentation. One such model is Benetech Labs that facilitate interdisciplinary collaboration to develop potential high-risk technology ideas that could have high social impact. The expansion of the lab concept that creates “safe spaces for innovation, where the negative risks can be managed and infeasible ideas or unsuccessful prototypes can be documented to support learning and knowledge building” will ultimately lead to innovations that save lives and protect well-being.¹³²

Development agencies and sympathetic stakeholders can help “make a market” for innovative technology for human rights by funding pilots and by helping ICT industry managers by informing them of current R&D needs and anticipated future challenges.

¹³⁰ <https://www.weforum.org/agenda/2016/05/4-billion-people-still-don-t-have-internet-access-here-s-how-to-connect-them/>

¹³¹ <http://technologytimes.ng/microsoft-one-billion-people-world-lack-mobile-phone/>

¹³² Guberek, et al, 2014. 35

Bridge the cultural differences between the ICT industry and human rights community

The culture within the technology community is characterized “by entrepreneurialism, risk taking, and a sense that ‘changing the world’ is possible through the design and engineering of ‘disruptive technologies’.” In contrast, the human rights community is sometimes characterized as slow to adopt new technologies, as “human rights agencies are often organized around norms and institutions designed to develop basic standards and defend rights. Human rights advances have been achieved through hard-fought struggles sustained over decades of activism, rather than through any quick-fix solutions. These differences can create disconnects that affect the processes of technology development, deployment and adoption. The technology community is energized by a sense that the development process may result in a ‘game-changing tool.’ However, in order to build technology in the service of human rights, deployment and adoption must be carried out according to the user needs of human rights actors on the ground.”¹³³

As the foregoing analysis shows, more needs to be done to raise awareness within the human rights community about the potential positive contributions that the ICT sector could contribute. Simultaneously, more needs to be done to help the ICT sector learn how to communicate with the human rights community. Both communities share certain common goals and aspirations which could reinforce the potential positive ties between them. The challenge is how to overcome certain current modalities and facilitate their ability to find common ground. Companies have begun to develop processes to make outreach and dialogue with human rights champions more systemic. For example, Oath has found that listening to human rights defenders and their experiences can help serve as an early warning signal of security threats and threats to free expression that might be building. Oath works to facilitate discussions among its engineers and product and legal teams with human rights defender groups to inform product and security design at early stages.

Build the capability of human rights defenders to use digital solutions

To benefit from digital technology, human rights defenders need support to know what data to collect, what to do with the data, what technology to use, how to choose the right device, how to select the right connectivity option, what platform to use, and how to get the most capability from software, apps, and other digital tools. Building the digital literacy of human rights defenders will pay dividends in the design, development, and deployment of technology for human rights.

Continue to build trust in the responsible practices of the ICT industry

A lack of understanding and trust between human rights defenders and the ICT industry may be inhibiting the evolution and adoption of technology for human rights. Leaders in the industry, supported by organizations such as GeSI and the Responsible Business Alliance, have made great efforts to engage with stakeholders and design policies and processes to respect human rights. As human rights defenders become aware and engaged in the industry’s efforts, pathways should open for collaboration in developing and disseminating technology for human rights.

¹³³ Guberek, et al, 2014. 33

Develop smart regulation, standards, and frameworks for the way technology is used

Well-designed regulation can guide ethical behavior for ICT companies, their partners, and those that use digital solutions. Because the sector is so dynamic, regulations should focus on the framework for innovation and for the human rights goals to be achieved, rather than seek to regulate specific technologies at a specific moment in their evolution, because they might quickly become obsolete. This is sometimes known as “principle-based” rather than “rule-based” governance.¹³⁴ Regulation cannot and should not inhibit access, connectivity, and innovation.

Encourage openness and transparency

Openness and transparency fuel the protection and preservation of rights. In addition, they underpin and grow a thriving ICT sector. Efforts that are particularly helpful to technology for human rights include the open data movement, open government reforms, anti-corruption efforts, and social accountability initiatives.¹³⁵

Enhance data security

Those working to repress and abuse rights often try to intimidate, jail, or physically harm individuals that resist and compile evidence. Building digital solutions that protect the identity, security, and privacy of human rights defenders is vital.

Ensure technology for human rights is inclusive

In certain cases, experiments with human rights and civic technology have found that lower income individuals, those lacking access to connectivity, and those with low digital literacy can be excluded from its benefits.¹³⁶ Technology for human rights must be designed to be inclusive.

Form frameworks and guidance for the responsible use of technology for human rights

There is a need for a framework to define the responsible use of technology for human rights. Consider that to be effective, technology for human rights may need to disclose information about affected individuals. Such disclosures could unintentionally compromise privacy and threaten individual security. The first rule of technology for human rights is that it should do no harm. Defining what this means in practice will be vital and require the ongoing and vigilant dialogue among industry, government, and the wider human rights community.

¹³⁴ “There are many reasons why the tendency to think in terms of architectures showed a marked increase in the period when the Internet emerged as a disruptive technology. The Internet makes a number of new business models possible (Timmers, 1999; Bouwman and Vanden Ham, 2003). The limited life span of these models implicates that organization, information and IT have to be flexible in order to respond quickly to changing circumstances and to adapt the business model if necessary. Business strategies that utilize the possibilities offered by Internet and ICT to the fullest are hard to implement however. A critical assessment of the internal processes in many organizations shows a substantial level of redundancy and rigidity, while business processes are usually organized in (often product-oriented) stove-pipes (Van Diepen, 2000). Due to this rigid organization, companies are unable to meet customer demands, coordinate processes and offer the painfully needed transparency.

This leads to the redesign of processes (Hammer and Champy, 1993). Due to the failing connection between the new customer-oriented business processes and information and the existing rigid product-oriented processes and information, companies find it extremely difficult or impossible to implement Customer Relationship Management (CRM). In combination with path dependencies, current (legacy) information systems often make it hard to realize changes in the business processes. Companies are limited in their response to changing market circumstances caused by a lack of flexibility and adaptability. It is often a slow and difficult process to translate adaptations in the strategy to the ICT domain (Maes et al., 2000). Strategic considerations therefore force us to break open information systems and reduce their complexity, using a more modular approach. However, such an approach affects the way these modules (for instance web services) are defined, combined and/or reused, as well as their scalability and the extent to which they can be used in a distributed environment (Turban, McLean and Wetherbe, 2002). We believe that business architectures are important tools in dealing with the issues above.”

Versteeg, Gerrit, Harry Bouwman, “Business architecture: A new paradigm to relate business strategy to ICT,” Information Systems Frontiers. January, 2006. https://www.researchgate.net/profile/Harry_Bouwman/publication/225180861_Business_architecture_A_new_paradigm_to_relate_business_strategy_to_ICT/links/09e4150e49eccc571e000000.pdf

pp 92-93:

¹³⁵ Civic Tech, 55

¹³⁶ Civic Tech, 45-46.

Increase collaboration and formal partnerships

The ICT industry itself thrives on collaboration. The industry has developed its own concept of a technology ecosystem in which products are able to truly thrive only with the complementary efforts made by a network of individuals and organizations that help use the technology, design additive functions to it, explain the technology, provide support when it breaks, promote the technology, and help encourage its adoption. Technology for human rights needs the same kind of partnership ecosystem.

Integrate human and digital solutions when applying technology for human rights

Technology for human rights should not forget to design in the human element. As capable as digital solutions may be, their core purpose should be to aid and enhance human validation, judgment, and interpretation.¹³⁷

Maintain vigilance regarding the potential unintended consequences of technology for human rights

The application of technology for human rights may have unintended consequences. It would therefore be useful to develop criteria and norms that define what the responsible development, application, and updating of technology for human rights should entail. For example, there is a growing movement to encourage ICT companies to donate data that can be used by analysts to understand and solve social challenges. It would be beneficial to define a standard that allows companies to make such donations of data for the public good while ensuring that the use of this kind of data does not compromise individual privacy. This would also include maintaining vigilance over the design and use of algorithms that power technology for human rights. Stakeholders should work to ensure such algorithms do not unintentionally target those innocent of committing rights violations.

Verify the legitimacy of data – particularly when used for forensics

There have been experiences in which technology has caused rights advocates to over-estimate impacts, and misattribute culpability. There is a need to ensure the representativeness of data and establish a causal link.¹³⁸

¹³⁷ See: Levine, 2014; Carr Center, 11, 13, 19-20; Civic Tech 39-40.

¹³⁸ See Guberek, et al, 2014. 29



VII. The Future of Technology for human rights

*"The future of technology for human rights is not something to predict, it's something to invent."*¹³⁹

As the world moves deeper into what has been described as the 4th Industrial Revolution, both the potential opportunities and perils of ICT for human rights will grow. Any attempt to forecast the future risks enter the realm of science fiction rather than reality. That said, Box 13 highlights a number of forecasts regarding the adoption of key technologies and systems.

Box 13: ICT Development and Adoption Forecasts

Broadband and internet:

- By 2021, 4.6 billion people will have access to and use the internet. This is 58% of the world's population (up from 44% in 2016)
- By 2021 there will be 27.1 billion networked devices and connections. This is 3.5 networked devices and connections per person.
- By 2021 82% of all IP traffic will be video (up from 67% in 2016)
- The majority of new internet user growth will occur in low and middle-income countries in Asia where nearly 700 million new internet users will connect. This growth is primarily driven by India and China, where over 276 million and over 238 million users, respectively, will connect. But other countries in Asia will see significant internet user growth, such as in Indonesia, where over 87 million people will start connecting to content and services over IP-networks. As a region, Africa and the Middle East has the fastest growing population of internet users with a compound annual growth rate (CAGR) of 10.8%. Over 178 million new users will connect in the region. Central and South America will also see a substantial rise, with over 109 million new users connected over the five-year time period¹⁴¹
- Despite the progress being made in global connectivity, by 2020 there will still be over 3.6 billion people not using the internet, the majority of whom will be lower income and/or in rural areas.¹⁴²
- By 2022, there will be 8.9 billion mobile subscriptions (6.5 billion subscribers)¹⁴³

Internet of Things

- As prices for semi-conductors fall, and connectivity technology develops, more machines are going online. Connected homes will be the leading sector, but all sectors will grow. The number of B2B IoT connections will greatly increase to 5.4 billion by 2020.
- The IoT market will grow from an installed base of 15.4 billion devices in 2015 to 30.7 billion devices in 2020 and 75.4 billion in 2025. Fleet management in transportation, security and surveillance applications in government, inventory and warehouse management applications in retail and industrial asset management in primary manufacturing will be the hottest areas for IoT growth.¹⁴⁴
- The global market for sensors will rise from \$110.4 billion in 2015 to an anticipated \$240.3 billion in 2022. The future of the role of sensor technology in the world is limitless. Several research projects are currently looking at various ways to manipulate this technology for future purposes such as enhancing the performance of energy sources like solar-powered batteries and fuel cells, improving the capability of these systems to monitor health, safety and security, as well as a potential use for environmental monitoring.¹⁴⁵

Satellites

- Accessible satellite and geospatial information and the analytic tools to use them will create unprecedented global transparency. Total coverage of remote sensing images over the entire globe with "revisit rates" that approach real time, constant imaging, with increasingly pinpoint accuracy. Satellites will provide coverage over 95% of the Earth's population.¹⁴⁶

¹³⁹ WITNESS, "The Future of Human Rights Technology," 6 November, 2014. <https://witness.org/the-future-of-human-rights-technology/>

The world is moving towards billions of people connected by mobile devices, with unprecedented processing power and storage capacity, and unlimited access to knowledge. We will also see technology breakthroughs in fields such as artificial intelligence, robotics, the Internet of Things, autonomous vehicles, 3-D printing, nanotechnology, biotechnology, materials science, energy storage, and quantum computing.¹⁴⁷ The hallmark of the 4th Industrial Revolution will be the integration of systems and related inter-operability. For example:

- Data analytics and machine learning will transform the design and discovery of life-saving medications; the approach to agriculture leading to a food productivity revolution; the structure of the way whole cities operate from traffic management, to energy distribution, to security and beyond; the design of financial systems and access to capital; and the evolution of human services with technologies that anticipate needs and preferences.
- Digital fabrication will create new fields and industries such as biological manufacturing and synthetic biology and “pioneer a symbiosis between microorganisms, our bodies, the products we consume, and even the buildings we inhabit.”¹⁴⁸
- Automation based upon machine learning and robotization will create a productivity revolution, increasing the quality and scale of goods and services while reducing costs. However, this trend may displace substantial numbers of jobs.
- The internet of things will connect nearly every kind of physical and material object to communications devices, data analytic software, and people. This will create the potential for systems to produce goods, make decisions, adapt to changing environments, and reorganize at a level of speed and intelligence never seen before.

The Founder of the World Economic Forum, Claus Schwab writes, “Like the revolutions that preceded it, the Fourth Industrial Revolution has the potential to raise global income levels and improve the quality of life for populations around the world [...]. At the same time, the revolution could yield greater inequality, particularly in its potential to disrupt labor markets.”¹⁴⁹

“The fields of technology and human rights will continue to become increasingly intertwined.”¹⁵⁰

“Exponential technologies – like artificial intelligence, robotics, the Blockchain – have applications to human rights advocacy that we have yet to dream up.”¹⁵¹

In an era in which data is becoming the new gold, ensuring human rights defenders have access to the most current capabilities related to connectivity, devices, hardware, software, data analytics, machine learning, digital networks, imaging, etc. will be critical. A number of the examples in this report rely on forms of technology that lag the current standard by a few years. In ICT industry time, this can mean they are more than a generation behind the state of the art. Human rights defenders may still benefit greatly from the use of aging technology. Yet they risk becoming rapidly obsolete. Human rights defenders lack a supporting ecosystem to help them upgrade not only hardware and software but to help evolve thinking of how to apply new solutions for greater impact.

¹⁴⁰ <https://www.cisco.com/c/en/us/solutions/service-provider/vni-network-traffic-forecast/infographic.html>

¹⁴¹ Garrity, John, “Internet User Growth Over the Next Five Years,” 22 June, 2016, The Huffington Post. https://www.huffingtonpost.com/john-garrity/internet-user-growth-over_b_10603196.html

¹⁴² Garrity, 2016

¹⁴³ Weidman-Grunewald, 18 Jan 2017 145

¹⁴⁴ Columbus, Louis, “Roundup Of Internet Of Things Forecasts And Market Estimates, 2016,” Forbes. 27, November, 2016. <https://www.forbes.com/sites/louiscolombus/2016/11/27/roundup-of-internet-of-things-forecasts-and-market-estimates-2016/#39a083e3292d>

¹⁴⁵ Cuffari, Benedette, “The Future of Sensor Technology in the Global Market,” 29 March, 2017.

<https://www.azosensors.com/article.aspx?ArticleID=775>

¹⁴⁶ Carr Center, 11-12

¹⁴⁷ Schwab, Klaus, “The Fourth Industrial Revolution: what it means, how to respond,” World Economic Forum, 14 January, 2016. <https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/>

¹⁴⁸ Schwab, 2016

¹⁴⁹ Schwab, 2016

¹⁵⁰ WITNESS, 2014

¹⁵¹ Halvorssen, 2017

Lacking its own supportive technology ecosystem, the human rights community will struggle to keep up with the knowledge necessary to understand the upside and downside impacts of digital solutions on human rights. If it's hard to assess the two-sided nature of a new technology, it's possible that, "In the future [...] people will approach new technologies with more skepticism and caution due to a greater awareness of surveillance, data collection and potential negative ramifications of unknown digital tools."¹⁵²

Emerging technology may make it easier for potential abusers to violate rights. We thus find ourselves at the start of a race between those that will learn how to use digital solutions to defend rights, against those that will learn to use it to repress and abuse rights. "Human rights organizations are going to be driven into a tactical, rather than mere advocacy role in interventions, filling in for almost some sort of counterintelligence roles in assisting local CSOs."¹⁵³ In an era of "exponential technologies" whose speed and capabilities advance on a geometric scale (and whose costs decrease at a proportionally rapid rate), the stakes could not be higher. This is a race that human rights defenders must win.

Taking into account these concerns and challenges, the technologies underpinning the 4th Industrial Revolution have the potential to transform the human rights movement. For example:

- "The ubiquity of [...] data means there will be more opportunities for triangulating evidence from different platforms: human, geospatial, and open source intelligence. Examples would include matching up perpetrator video uploaded onto social media, a human intelligence network, satellite imagery, and then getting defense ministries to identify specific units and even commanders" who have violated rights.¹⁵⁴
- ICT will enable us to all to become human rights activists, investigators, and defenders. "There have always been witnesses to human rights abuse, some of whom provide testimony, or leave a record of complaints. Now in an age of widely available cell phones, digital cameras, internet connections and distribution platforms, such as Facebook, YouTube, and Flickr, it is possible for more individual citizens to play a significant role in human rights documentation and advocacy. As a result, new types of actors, such as bloggers, citizen journalists, and online social movements, are becoming increasingly integrated into the international human rights system. Technology itself is being used to synthesize, curate and amplify diverse data and diverse voices."¹⁵⁵
- Progress in use of algorithms and AI will lead to the ability of predictive analytics that can forecast the probability of rights violations before they happen.¹⁵⁶ "As machines become capable of much of what makes us human, it will fall to businesses to embed our corporate values and codes of conduct into our supply chain tools to achieve business objectives. By taking a human-centric approach to AI and technologies such as IoT, we can tap into workers' knowledge and insight while also ensuring their fair treatment."¹⁵⁷
- The combination of advances in forensic analysis in biology (DNA analysis), chemistry (mass spectrometry, and ICT (processing power and software analytic capabilities) will enable forensics to reconstruct almost any event and identify human rights perpetrators.¹⁵⁸
- Virtual reality (VR) will be everywhere. "We won't have PDFs in communicating human rights challenges and the prosecution cases in tribunals VR will be the method of interaction."¹⁵⁹

If we are successful, we may very well see the scenarios that we posited in the introduction come true. When a country falls into sectarian violence, the damage imposed on vulnerable populations will be mitigated. Refugees, displaced and diasporan populations will not be exploited. Autocratic behaviors and human rights abuses will be exposed, and labor rights and rights to assembly and connectivity will be upheld and strengthened.

¹⁵² WITNESS, 2014

¹⁵³ Carr Center

¹⁵⁴ Carr Center, 30

¹⁵⁵ Guberek, et al, 12

¹⁵⁶ Sandhu, 2017

¹⁵⁷ Nair, 2018

¹⁵⁸ Carr Center, 20

¹⁵⁹ see Carr Center



VIII. Taking Action

*"We stand on the brink of a technological revolution that will fundamentally alter the way we live, work, and relate to one another. In its scale, scope, and complexity, the transformation will be unlike anything humankind has experienced before. We do not yet know just how it will unfold, but one thing is clear: the response to it must be integrated and comprehensive, involving all stakeholders of the global polity, from the public and private sectors to academia and civil society."*¹⁶⁰

*"As never before, it is in the hands of technology companies to help or hinder the space available for promoting human rights. Now is the moment for industry leaders to step up to the plate and support thousands, if not millions, of people by adopting features, policies and products that protect the safety of users and support core human rights values like privacy and anonymity."*¹⁶¹

Never before in human history has a technology had greater potential to affect private, family, workplace, political, economic, and legal spheres as does ICT. In fact, what makes ICT both exciting and dizzying is how it blends these spheres together.

In the future, ICT will give every citizen the potential (if not the duty) to be a guardian of human rights and an investigator into abuses. In this regard, the ICT industry has a key role to perform. Going forward human rights defenders would profit from opening a dialogue with the industry and engaging it in their work. ICT companies "have the capacity to provide not only support for cutting-edge work, but also to engage in the field as active agents of change. [Companies], as agents of change, can bridge [...] gaps by shaping programs that support groups and individuals from different spheres who are working towards the same goals."¹⁶²

Meeting a future in which technology for human rights finds the same exponential, beneficial, world-changing path as other ICT products and services requires sorting through complex technical, operational, organizational, legal, and ethical considerations.

We propose the development of a Partnership among human rights defenders and leaders in the ICT industry to advance Technology for human rights. GeSI proposes to create a Human Rights Technology Innovators' Network to Use ICT to Enable Human Rights ("Innovators' Network").

The **mission** of the Innovators' Network will be to coordinate the collective capabilities of ICT industry leaders, human rights organisations, policy makers, academia, and social innovators, to accelerate and scale-up the development and application of technology that enables human rights.

¹⁶⁰ Schwab, Klaus, "The Fourth Industrial Revolution: what it means, how to respond," World Economic Forum, 14 January, 2016. <https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/>

¹⁶¹ <https://witness.org/our-work/tech-advocacy/>

¹⁶² Guberek, et al, 2014. 6

The **objectives** of the Innovators' Network will be to enable human rights through technology and to:

- Empower human rights defenders with enhanced ICT solutions;
- Increase digital access, digital literacy, and the availability of the latest generations of digital technology;
- Educate people on how to better use technology to protect their rights;
- Enhance relationships between the human rights and ICT communities;
- Ensure that ICT is an important force for supporting people's rights;
- Build the understanding of the opportunities from scaling up the adoption of innovative enabling technologies.

The Network will achieve these objectives through the following activities:

- Connecting innovators together;
- Forming multi-sector stakeholder councils of key leaders;
- Developing clear business cases;
- Supporting the efforts of the ICT industry to build trust regarding its own responsible behaviors.

GeSI will be meeting with organisations and key leaders to discuss opportunities for involvement in the Innovators' Network such as human rights organisations, policy makers, academia, and social innovators and ICT leaders, to accelerate and scale up the development and application of technology that enables human rights.

Working collaboratively, the ICT industry and human rights defenders can shape a future that empowers individuals to protect and preserve their rights. Yet, technology for human rights is not a panacea. It currently cannot solve human rights challenges by itself, and it may never be able to. Its potential is to enable and enhance the work of human rights defenders. To do so requires vigilance to ensure the industry meets its own responsibilities and that its products and services are not misused. Trust must grow between the industry and human rights defenders because partnerships will be a vital vehicle to help digital solutions reach their potential.

The diffusion and improvement of human rights is a continuous process. This report illustrates some ways that the ICT industry can support this process. Much more needs to be done, but there are several ways forward that clearly support this effort.

Annex: Glossary

Blockchain: a digital ledger in which transactions made in bitcoin or another cryptocurrency are recorded chronologically and publicly

Circumvention tools: a variety of technology solutions and software applications that help individuals and organizations avoid digital and online censorship

Cloud computing: the practice of using a network of remote servers hosted on the Internet to store, manage, and process data, rather than a local server or a personal computer

Crowdsourcing: obtaining work, information or opinions from a large group of people who submit their data via the Internet, social media and smartphone apps

Cryptocurrency: a digital currency in which encryption techniques are used to regulate the generation of units of currency and verify the transfer of funds, operating independently of a central bank

Data mapping: a special type of data dictionary that shows how data from one information system maps to data from another information system

Data imaging: converting files into data images, and applying the capabilities to analyze the data that has been captured

Encryption: The translation of data into a secret code. Encryption is an effective way to achieve data security

Geospatial/satellite imaging: photographic images taken by satellites

Internet of Things: the interconnection via the Internet of computing devices embedded in everyday objects, enabling them to send and receive data

Machine learning/AI: Machine learning is a subset of artificial intelligence in the field of computer science that often uses statistical techniques to give computers the ability to “learn” with data, without being explicitly programmed

Mirroring: keeping a copy of some or all of the contents of a network site at another site, typically in order to improve accessibility

Relational databases: a database structured to recognize relations among stored items of information

Remote sensors: remote sensing is the science of obtaining information about objects or areas from a distance, typically from aircraft or satellites

Social computation: social computation uses digital networks to mobilize volunteers to help analyze large volumes of data that require human insight and interpretation

United Nations Sustainable Development Goals (SDGs): The Sustainable Development Goals (SDGs, or Global Goals for Sustainable Development) are a collection of 17 global goals set by the United Nations in 2015. The goals are broad and interdependent, yet each has a separate list of targets to achieve. Achieving all 169 targets would signal accomplishing all 17 goals. The SDGs cover social and economic development issues including poverty, hunger, health, education, global warming, gender equality, water, sanitation, energy, urbanization, environment and social justice

VoIP: voice over internet protocol allows for telephone communication made over the internet

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GeSI ENABLING
DIGITAL
SUSTAINABILITY

Global e-Sustainability Initiative (GeSI),
c/o Scotland House
Rond Point Schuman 6
B-1040 Brussels Belgium

Tel: +32 2 282 84 42
Fax: +32 2 282 84 14

General enquiries: info@gesi.org