MAPPING HUMANITARIAN TECH

Exposing protection gaps in digital transformation programmes

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Acknowledgements

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1. Executive Summary

The digital transformation of humanitarian response has been hailed as a sign of improvement and modernization that was long overdue in a sector often accused of being conservative and inefficient. However, through our research, we found that international humanitarian organizations and private tech companies enjoy solid and dynamic relationships, in some cases extending over decades of collaboration and often resulting in experimental use of emerging technologies and innovative approaches. These sectors increasingly dovetail, and even swap roles, with serious implications for the digital rights of people and communities at risk.

We began mapping the presence of corporate tech in humanitarian action to investigate these relationships, but also the objections raised by human rights and humanitarian advocates, especially those from the Global Majority, regarding how these powerful actors address the people in vulnerable situations whose data course through humanitarian tech pipelines. We find ample reason for alarm and further inquiry. The actors playing an active role in a global tech environment are few, mostly from the Global Minority, and have consolidated, resulting in *de facto* control over humanitarian technologies and data by a worryingly limited number of companies. In addition, these tech actors are almost always providing similar or related services to military or law enforcement agencies, even in the same time and place where they contribute to humanitarian support, with no clear guarantee on the distinction between sensitive and commercial data or safeguards to screen for conflicting interests or prevent regulatory capture.

More broadly, we believe that two converging processes are unfolding: the transformation of some humanitarian actors into tech services providers, and the transformation of tech companies into *de facto* humanitarian service providers. This phenomenon is happening without these entities taking up the responsibilities and duties that regulate their expanded area of intervention, resulting in serious gaps in accountability. The collaboration between humanitarian organizations and companies is also bringing emerging and untested technologies to volatile contexts without any transparency, due process, protection protocols, or recourse mechanisms.

The humanitarian sector increasingly relies on digital tools and remote contact with those they assist, in part because of shrinking access to conflict-affected communities. Ultimately, the failure of states and conflict actors to uphold international law creates gaps these sectors attempt to fill, through whatever tools available.

However, as Access Now uncovers, humanitarian tech partnerships seem to dodge normative and regulatory data protection frameworks, whether by claiming the extra-legality and extraterritoriality of the technology or the implementation, or taking advantage of the secretive nature of their agreements, and sometimes of their immunities. Humanitarianism benefits from the constant improvement of the tools offered to improve life and dignity of people experiencing vulnerability. But

this cannot and should not come at the cost of treating the most vulnerable as test subjects for often-exploitive new tools, creating long tails of data with uncertain impacts. Through the lens of human rights we have learned the hard way the harms caused by a digital transformation based mostly on narrow market incentives, with little oversight. Instead, we propose greater investment in rigorous safeguards and responsible digital transformation, allowing humanitarians to better serve people at risk while also spreading sunlight on this opaque network of business relationships, emerging technologies, and data dynamics.

In this report we:
1) present a set of conclusions highlighting the key trends and concerns emerging from the mapping of humanitarian tech
2) identify future areas for further investigation, and
3) introduce a series of recommendations to donors, the humanitarian community, tech companies, and local actors and communities.

2. Intro - Private tech in humanitarian action

In a telling mix of humanitarian lore and denial, the formalization of international humanitarian law (IHL) started in 1859[1] thanks to a traveling businessman who cooperated with the local townsfolk to bring relief and dignity to the wounded soldiers after the gruesome battle of Solferino. What is less known, is that the first humanitarian businessman was also an exploitative colonial settler, who would go on to co-father the Geneva Conventions with Gustave Moynier, a jurist commercially associated with the genocidal exploitation of Congo by King Leopold II.[2]

Since then, the humanitarian framework has been repeatedly challenged and kept evolving to adjust to the changing nature of the means and methods of warfare and their impact on the civilian population. The development of digital systems has further evaporated the physical boundaries of harm, creating new dangers for civilians[3] by allowing the delivery of cyberattacks, incitement to violence, the spread of misinformation and hate speech at scale, and psychological harm from surveillance and tracking.

More than 150 years later, the emergence of new actors – including tech companies and grassroots organizations – in the public discourse on humanitarian response is redefining the very nature of

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[1] Mamedov, Elchin. What are the origins of International Humanitarian Law? (October 7, 2017). ICRC Blog post. https://blogs.icrc.org/ilot/2017/08/07/origins-international-humanitarian-law/.
[2] Petite, Simon. Gustave Moynier, au service du CICR et... du Congo léopoldien. (January 6, 2021). Le Temps article. https://www.letemps.ch/suisse/geneve/gustave-moynier-service-cicr-congo-leopoldien.
[3] Rizk,Joelle and Cordey, Sean. What we don't understand about digital risks in armed conflict and what to do about it. (July 27, 2023). Humanitarian Law and Policy article. https://blogs.icrc.org/law-and-policy/2023/07/27/digital-risks-in-armed-conflict/.

humanitarianism,[4] with complex consequences for the rights of people and communities experiencing vulnerability, including in the digital sphere.

In the face of this constant change, the international community has invested in a booming humanitarian market,[5] both in terms of available resources and the number and variety of actors providing emergency relief. This persistent trend has led Cindy McCain, Executive Director of the World Food Programme (WFP), to define the humanitarian space as "one of the world's biggest growth industries."[6]

More soberly, in 2020 the World Bank estimated that the number of people living in proximity to conflict — defined as within 60 kilometers of at least 25 conflict-related deaths — had nearly doubled since 2007, and that as many as two thirds of the world's extreme poor will live in areas characterized by fragility, conflict and violence by 2030.[7] Meanwhile, the number of forcibly displaced persons globally has reached record levels.[8]

On the economic side, the continuous pleas for additional funding by humanitarian actors might lead one to forget that the sector has experienced a huge growth in international humanitarian financing. International humanitarian assistance has nearly doubled over the past decade, reaching the historical top estimate of approximately USD $31.3 billion in 2021.[9] This rise owes in part to increased support by the private tech sector, especially where there is alignment between market expansion and demand by the humanitarian community such as in the artificial intelligence (AI) or digital ID sector.

Beyond market-driven incentives, our research highlights other factors driving these partnerships: ethical values, corporate social responsibility, staff satisfaction, visibility, budget governance, and fiscal incentives. This broad spectrum of motivations may sometimes result in value misalignment

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[4] Sezgin, Zeynep and Dijkzeul, Dennis. The New Humanitarians in International Practice: emerging actors and contested principles. (2015). Routledge. https://academic.oup.com/jrs/article-abstract/30/4/630/4741417.

[5] Carbonnier, Gilles. Humanitarian Economics. (September 2015). Hurst. https://www.hurstpublishers.com/book/humanitarian-economics/.

[6] WFP Head Urges Business Leaders to Develop Smart Innovations in Fight against Hunger, Poverty, at Security Council Debate on Public-Private Partnerships. (September 14, 2023). United Nations meeting report. https://press.un.org/en/2023/sc15410.doc.htm.

[7] Fragility and Conflict: On the Front Lines of the Fight against Poverty. (February 27, 2020) The World Bank blog post. https://www.worldbank.org/en/topic/poverty/publication/fragility-conflict-on-the-front-lines-fight-against-poverty.

[8] UNHCR Refugee Data Finder. (October 24, 2023). UNHCR Database. https://www.unhcr.org/refugee-statistics/.

[9] Obrecht, Alice; Swithern, Sophia; and Doherty, Jennifer. 2022 SOHS report. (2022). ALNAP webpage. https://sohs.alnap.org/sohs-2022-report/a-reader%E2%80%99s-guide-to-this-report.

among partners, often resulting in the so-called "aidwashing"[10] or even in forms of humanitarian extractivism[11] and experimentation[12] on the communities made vulnerable by the crisis.

In approaching this mapping, we decided to focus on the sensitive data and metadata (including personal and demographic data) collected and processed by those holding themselves out as humanitarian aid providers in situations of conflict, violence, or complex humanitarian crises, and their clients and vendors. We follow the journey of this data as it is collected or communicated by its owners in the most vulnerable moments of their lives, until it is hosted in faraway countries and processed for the benefit of the commercial AI of the future. We acknowledge that the voices of these affected people and communities are not adequately reflected in this document. Indeed, they are excluded from any decision regarding the whole lifecycle that has been decided for the information extracted from them. We see this foundational report as a step toward addressing this gap and correcting this injustice.

By defining the entirety of the process and its consequences, we also offer all the actors involved concrete recommendations aimed at correcting the course of digital development, mitigating the emerging risks, and offering measures for reparation in case of harm.

3. Methodology

The investigation for this mapping took place over a period of five months, between June and November 2023. The analysis synthesizes extensive desk research and more than 40 semi-structured interviews with experts from humanitarian organizations, tech companies, academia, and public sector, among others. A more limited amount of inputs were also collected through an anonymous survey, all individually verified by the research lead.

To foster trust and openness on a topic marred by lack of transparency and diffidence, the mapping and all related products do not specifically attribute any quote nor citation from the interviews, which are confidential.

Due to the hybrid nature of most organizations involved in humanitarian initiatives, and the difficulty to universally define what qualifies as humanitarian uses of a technological solution, this mapping exercise prioritizes those companies and applications addressing the direct consequences of conflict,

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[10] Martin, Aaron. Aidwashing Surveillance: Critiquing the Corporate Exploitation of Humanitarian Crises. (March 16, 2023). Surveillance & Society article. https://ojs.library.queensu.ca/index.php/surveillance-and-society/article/view/16266.
[11] Bergtora Sandvik, Kristin. Humanitarian extractivism. (October 2023). Manchester University Press. https://manchesteruniversitypress.co.uk/9781526173355/.
[12] Bergtora Sandvik, Kristin, Jacobsen, Katja Lindskov, and McDonald, Sean Martin. Humanitarian experimentation. (November 28, 2017). Humanitarian Blob & Policy blog post. https://blogs.icrc.org/law-and-policy/2017/11/28/humanitarian-experimentation/.

violence, or complex humanitarian crises. We consider complex humanitarian crises those situations where there is a concurrent human-made and non-human made disaster.

In selecting the type of solutions to study, we decided to narrow the focus to several technological areas, namely Sensitive Data Management and Communication; Connectivity and Cybersecurity; Digital ID and Biometrics; Advanced Analytics, AI, and Cloud Processing.

Even after reducing the scope, we need to acknowledge an inherent complexity embedded in the modular working of the modern tech industry. For example, biometric technologies[13] typically contain six conceptual 'modules' that include hardware and algorithms: "sensors, aliveness detection, quality checker, feature-generator, matcher, and decision modules."[14] Very often, these various components are provided by different companies based on extremely context-specific combinations of cost, purpose, requirements, and partnership conditions. Whenever possible, we tried to at least name the main providers of the modules used for the technologies explored in this report, but in most cases we only focus on the main provider of the agglomerated system.

4. Companies and humanitarian data

a. Collecting the data: data management & communication

In the journey of personal and often sensitive data going from affected communities towards cloud processing and analytics, data collection and management is one of the first steps. It is aimed – among other goals – at informing the immediate response to an emergency, the development of the humanitarian response plan for each country, and the funding levels dedicated to each response, as well as its monitoring and evaluation.[15]

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[13] Wang, Xiaowei. Bodily Harms. (October 2023). Access Now report. https://www.accessnow.org/wp-content/uploads/2023/10/Bodily-harms-mapping-the-risks-of-emerging-biometric-tech.pdf.
[14] ISO/IEC 2382-37:2017 Information technology — Vocabulary — Part 37: Biometrics. (December 2023). ISO vocabulary entry. https://www.iso.org/obp/ui/#iso:std:iso-iec:2382:-37:ed-2:v1:en:term:3.1.1.
[15] Henry, Lewis and Forster, Gary. Data collection, analysis and use in protracted humanitarian crises. (June 17, 2020). Humanitarian Data Transparency series brief. https://reliefweb.int/report/iraq/data-collection-analysis-and-use-protracted-humanitarian-crises-humanitarian-data. For a more detailed definition and the full list of data responsibility definitions please refer to IASC Operational Guidance Data Responsibility in Humanitarian Action. (April 2023). IASC Operational Policy and Advocacy Group. https://interagencystandingcommittee.org/sites/default/files/migrated/2023-04/IASC%20Operational%20Guidance%20on%20Data%20Responsibility%20in%20Humanitarian%20Action%2C%202023.pdf.

Organizations gather a constant stream of data that includes personal and identifiable information, amidst demographic, geospatial, operational, survey and perception, and administrative data,[16] together with purely qualitative data covering safety, security, events, customs, habits, economy, and conflict-related insights.

Concretely, data management covers "various stages of information processing from production to storage and retrieval to dissemination towards the better working of an organization."[17] It is also one of the first historical areas where the development, academic, and private sectors collaborated to create humanitarian tech. The DHIS software project has had a pioneering role in this area, active since post-apartheid South Africa in 1994, although fully deployed as DHIS2 software project only in 2006. Funded by the Norwegian Agency for Development Cooperation (Norad), the University of Oslo and the Research Council of Norway, it was initially conceived to strengthen health systems in the Global Majority but is now also actively used in conflict settings.[18]

One of the first companies offering data collection services for the development and humanitarian sector was Dimagi, Inc,[19] founded by MIT and Harvard researchers, followed by Nafundi, LLC,[20] born at the University of Washington with support from Google. In 2008, both companies launched similar products, CommCare[21] and Open Data Kit (ODK),[22] aiming to build information services and improve medical data management in resource-constrained environments. Both systems and their successors provide a suite of scalable data collection tools by leveraging commercially available mobile devices and cloud platforms and adopting an open source approach. ODK's design focus created sector standards (such as ODK XLSForm)[23] that generated a whole ecosystem of service providers – ONA,[24] KoboToolbox,[25] SurveyCTO,[26] LMMS,[27] among others – launching ODK-compatible data collection systems, or using some of its modules to build their own spinoff. Most of these companies are either traditional companies or BCorps, but some, for example KoboToolbox, are an international nonprofit tech organization, while DHIS2 is a global digital public good.[28]

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[16] Id. See also IASC Guidelines on Common Operational Datasets in Disaster Preparedness and Response. (June 2010). IASC Task Force on Information Management. https://interagencystandingcommittee.org/sites/default/files/migrated/2019-02/common_operational_datasets.pdf.

[17] *Id.*

[18] DHIS2: Our Vision & Partners. (Last accessed in January 2024). Website. https://dhis2.org/vision-and-partners.

[19] Dimagi. (Last accessed in December 2023). Website. https://www.dimagi.com/.

[20] Nafundi. (Last accessed in December 2023). Website. https://nafundi.com/.

[21] Commcare. (Last accessed in December 2023). Website. https://www.dimagi.com/commcare/.

[22] ODK. (Last accessed in December 2023). Website. https://getodk.org/.

[23] ODK XLS Forms. (Last accessed in December 2023). Website. https://xlsform.org/en/.

[24] ONA. (Last accessed in December 2023). Website. https://ona.io/home/.

[25] Kobo Toolbox. (Last accessed in December 2023). Website. https://www.kobotoolbox.org/.

[26] SurveyCTO. (Last accessed in December 2023). Website. https://www.surveycto.com/.

[27] LMMS. (Last accessed in December 2023). Website. https://lmms.org/.

[28] DHIS2. (Last accessed in January 2024). Digital Public Good Alliance webpage. https://digitalpublicgoods.net/registry/dhis2.html

Despite their humanitarian vocation, these companies do not disclose the full list of their customers; unfortunately, such secretiveness is standard for the tech sector. Some aid actors do declare a primary provider, including:

- Red Cross Red Crescent National Societies (ODK[29] and KoboToolbox)[30]
- Humanitarian OpenStreetMap Team (ODK)[31]
- World Vision International (using their own Last Mile Mobile Solution - LMMS),[32] and
- Action against Hunger (KoboToolbox).[33]

However, most entities do not have a single, mandated data collection tool. These include:[34]

- the World Health Organization (ODK,[35] ONA,[36] MAGPI, DHIS2[37])
- OXFAM (Mobenzi,[38] SurveyCTO), and
- UNICEF (Primero, ONA, Mobenzi, MAGPI, AKVO Flow,[39] DHIS2[40], ODK[41]).

In some rare instances, it is possible to find sector guidance on which tools *not* to use. For example, Module 4 of the Data Playbook developed by the International Federation of Red Cross and Red Crescent National Societies (IFRC) and the Solferino Academy recommends actors, "not use Google Docs (for collecting or storing sensitive data) as Google has access to all data in its terms of service."[42]

The open source nature of most commonly used systems makes it impossible to track every existing self-hosted instance. In practice, this creates a patchwork of data collection systems offering different degrees of data protection and security, and of practices even within each organization. Such phenomenon radically hampers the potential mitigating impact of initiatives to facilitate digital

[29] ODK for Crisis Response. (Last accessed in December 2023). ODK blog post. https://getodk.org/success-stories/crisis-response/.
[30] IFRC KoBo (Last accessed in January 2024). IFRC webpage. https://www.ifrc.org/ifrc-kobo
[31] ODK for Field Mapping. (Last accessed in December 2023). ODK blog post. https://getodk.org/success-stories/field-mapping/.
[32] Last Mile Mobile Solutions® (LMMS). (Last accessed in December 2023). World Vision International blog post. https://www.wvi.org/disaster-management/last-mile-mobile-solution-lmms.
[33] Action Against Hunger Kobo Toolbox login page. (Last accessed in December 2023). https://kobo2.actioncontrelafaim.org/accounts/login/.
[34] The following list is indicative and non-exhaustive, due to the lack of public tech stack catalog
[35] ODK for Disease Surveillance. (Last accessed in December 2023). ODK blog post. https://getodk.org/success-stories/disease-surveillance/.
[36] ONA. (Last accessed in December 2023). Website. https://ona.io/home/.
[37] DHIS2: Our Vision & Partners. (Last accessed in January 2024). Website. https://dhis2.org/vision-and-partners/.
[38] Mobenzi. (Last accessed in December 2023). Engineering for Change product page. https://www.engineeringforchange.org/solutions/product/mobenzi/.
[39] Remote data collection in conflict locations. (Last accessed in December 2023). AKVO blog post. https://akvo.org/stories/west-africa/remote-data-collection-in-conflict-locations/.
[40] DHIS2: Our Vision & Partners. (Last accessed in January 2024). Website. https://dhis2.org/vision-and-partners/.
[41] RT-VaMA is a ODK-based tool. Fast Data: The Key to Efficient Vaccine Delivery. (March 4, 2022). UNICEF webpage. https://www.unicef.org/innovation/stories/fast-data-key-efficient-vaccine-delivery.
[42] Data Playbook Module 4: Getting the Data We Need. (2022). IFRC, Solferino Academy. https://preparecenter.org/wp-content/uploads/2022/06/DTPB-M4.pdf.

literacy and accessibility, or implement standard operating procedures (SOPs), and opens up unpredictable vulnerabilities at the very source of the data management process.

Even though there's no official global record or list of who's using what and where, and those statistics include many other applications outside humanitarian response, it is still safe to assume that as of today, at least one ODK-based data collection platform is being used by humanitarian actors in any active humanitarian response on the planet, and that the same or adjacent data is collected and transferred by several organizations in parallel through these platforms who often also offer hosting management services.

It is possible, however, to infer the extent of the information siphoned through the data pipelines managed or provided by data collection companies. At the time of writing, CommCare claims[43] to be supporting more than one million users across 130 countries. KoboToolbox boasts[44] more than 20 million surveys collected per month across 241 countries and territories by more than 14,000 adopting organizations. Around 2 million users (4 million if including all branded instances) reportedly[45] send more than 200 million submissions annually from all over the world through ODKCollect. This tech is ubiquitous but largely unseen and under-scrutinized in the main discourse around tech and accountability.

Geographically, with few exceptions most of these data collection companies have their headquarters and data centers in Europe or North America,[46] and notably several have a shared origin at Harvard (for example ODK, Kobo, CommCare). ONA, which has their headquarter in Kenya, is possibly the main exception now that the South Africa-based Mobenzi seems to have terminated their activities.[47]

The vast majority of companies offering humanitarian technology for data collection solutions originate from and target health and public health research or programming as business areas. Most of these systems are constantly evolving and releasing new features[48] but their business model (and their limited development capacity) requires a delicate balancing act between competing priorities, resulting in heavy tradeoffs between ethically needed components, and customer-driven product development. To a degree, these considerations drive them quite close to ordinary for-profit tech companies.

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[43] About Dimagi. (Last accessed in December 2023). Website page. https://www.dimagi.com/about/.

[44] Kobo Toolbox. (Last accessed in December 2023). Website. https://www.kobotoolbox.org/.

[45] ODK. (Last accessed in December 2023). Website. https://getodk.org/.

[46] Tech Cartographies. (Last accessed in December 2023). Website. https://www.cartografiasdainternet.org/en.

[47] Most of the public facing assets belonging to Mobenzi, including social media and the official website, are either inactive or suspended at the time of publication of this report.

[48] ODK Roadmap. (Last accessed in November 2023). Website. https://getodk.notion.site/getodk/2cba7220132e49ffb56f8fce96d06bd0?v=9a7f435947a84f7eb10bdaa94d2bef11.

Data protection issues

In 2021, CartONG, a French humanitarian-to-humanitarian (HTH) support NGO, assessed most common data collection solutions[49] and found out that some privacy, data protection, and GDPR compliance features such as flagging and limiting access to personal identifiable information (PII) were still largely unaddressed by most of these providers, and that none of the tools allow a user to pre-set an expiration date for the entire dataset.

In some cases, the system does not even allow bulk deletion of entries. In practice, this means that as NGOs are often required by donors to keep sensitive data belonging to people experiencing vulnerability for up to 5 years,[50] staff would commonly have to go back through the records and manually delete thousands of old, unneeded entries one by one, or to intervene at the backend by editing directly the underlying database, which is a delicate process requiring specific skills. It is fair to assume that most nonprofit organizations might be hosting extremely sensitive data that is a decade old, for no justifiable reason.

Based on our interviews, some organizations like IFRC minimize risks by setting up their own servers with embedded data protection rules,[51] including archive rules; for more on servers and cloud services see section 4.d below. However, given the lack of public disclosures, we cannot know who else has similar systems in place, nor what kind of risk reduction strategies each one introduced.

The approach chosen by data collection companies on other key digital security features, such as encryption, vary widely between solutions. The 2021 CartONG study reports a variety of design choices ranging from "no encryption on data during transfer to encryption of the whole survey or specific questions only, to allow for partial visualization on the platform."[52] Even those companies that offered advanced end-to-end encryption, however, shared with Access Now that given the additional complexity that encryption adds to almost all layers of the tech design and deployment process, very few customers actually ask for this feature and almost none of them is from the humanitarian field with most actors opting for mandating at-rest encryption only (for example, IFRC[53] and ICRC[54] have both reported to use some form of encryption). Given that humanitarian organizations are likely

[49] Benchmarking of Mobile Data Collection Solutions. (2021). CartONG report. https://www.im-portal.org/help-library/benchmarking-of-mobile-data-collection-solutions-2021.
[50] Audit. (Last accessed in December 2023). DG ECHO website. https://www.dgecho-partners-helpdesk.eu/ngo/audit.
[51] IFRC KoBo (Last accessed in January 2024). IFRC webpage. https://www.ifrc.org/ifrc-kobo.
[52] Benchmarking of Mobile Data Collection Solutions. (2021). CartONG report. https://www.im-portal.org/help-library/benchmarking-of-mobile-data-collection-solutions-2021.
[53] IFRC KoBo (Last accessed in January 2024). IFRC webpage. https://www.ifrc.org/ifrc-kobo.
[54] Cyber attack on ICRC: What we know (February 16, 2022) ICRC Webpage. https://www.icrc.org/en/document/cyber-attack-icrc-what-we-know.

targets of cyberattacks[55] (see also the section 'Extracting the Data' below), data that is transferred via unencrypted channels is at heightened risk of unauthorized access and surveillance.

The humanitarian sector increasingly relies on digital tools and remote contact with those they assist. This owes in part to the shrinking humanitarian access to conflict-affected communities, which limits substantially the possibility of direct data collection in-person by deployment teams, and the fact that as of 2019 around 70% of the world's population used mobile phones.[56] Humanitarian organizations have been increasingly relying on remote assessment and communication systems to expand their outreach and the type of data to corroborate it. While some platforms such as Magpi have integrated SMS and Interactive Voice Response (IVR, an automated phone system technology) in their system, more commonly aid actors relied on another set of companies performing mass polls and surveys,[57] by phone or through SMS.

Some aid actors developed standalone programming approaches around phone-based assessments, such as the World Food Programme (WFP)'s mobile Vulnerability Analysis and Mapping (mVAM)[58] projects that collects food security data through short mobile phone surveys, using SMS, live telephone interviews and an IVR system. In 2016, the mVAM project even explored a collaboration[59] with Discover, a free service piloted by Facebook (then called Free Basics,[60] and only tested in Peru with telcos Bitel, Claro, Entel, and Movistar), that would have allowed users to visit a website and obtain updated data straight to their smartphone. mVAM also integrated AIDA, a chatbot building system created in partnership with inSTEDD,[61] an international technology nonprofit, with funding from Cisco Foundation. Interestingly, the inSTEDD team decided to not use natural language processing to allow AIDA to train chatbots to follow and respond to conversations, as NLP would require a chatbot to be built only in widely spoken languages like English and French.[62]

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[55] Guidance Note on The Implications of Cyber Threats for Humanitarians. (March 2023). OCHA Centre for Humanitarian Data. https://data.humdata.org/dataset/2048a947-5714-4220-905b-e662cbcd14c8/resource/848a05e7-38e8-4d30-a93a-065b07ac5805/download/guidance-note-on-the-implications-of-cyber-threats-for-humanitarians.pdf.

[56] Von Engelhardt, Johannes, and Jones, Lindsey. Using mobile phone surveys to track resilience and post-disaster recovery: A how-to guide. (January 30, 2020). BRACED manual. https://reliefweb.int/report/world/using-mobile-phone-surveys-track-resilience-and-post-disaster-recovery-how-guide.

[57] Id.

[58] Mobile Vulnerability Analysis and Mapping (mVAM). (Last accessed in December 2023). WFP. https://documents.wfp.org/stellent/groups/public/documents/communications/wfp286921.pdf.

[59] 2016 Mobile Vulnerability Analysis and Mapping (mVAM). (Last accessed in December 2023). WFP. https://documents.wfp.org/stellent/groups/public/documents/communications/wfp286919.pdf.

[60] Facebook Free Basics. (Last accessed in December 2023) Website page. https://www.facebook.com/connectivity/solutions/free-basics/.

[61] InSTEDD. (Last accessed in December 2023). Website. https://instedd.org/.

[62] Helping Humanitarians to Build Chatbots: Introducing AIDA. (February 5, 2018). InSTEDD blog post. https://instedd.org/blog/helping-humanitarians-to-build-chatbots-introducing-aida/.

Case study 1: mVAM
Traditionally, surveys in situations of conflict and displacement were often one-off events aimed mostly at assessing the immediate needs of a community. Survey rounds used cross-sectional design – where the data is collected from many individuals at a single point in time – due to the difficulty of tracking the same affected populations across time. However, the spread of phone technologies allows organizations to repeatedly approach the same individuals over time (panel design) in an easier and cheaper way. This approach was used for example by the mVAM team in Yemen in 2016, when the security situation on the ground forced WFP to set up mobile phone panel surveys from outside the country, using a method called Random Digit Dialing (calls to phone numbers randomly selected by humans or by a computer).[63] This allowed the team to build up a sizable panel and repeat calls at regular intervals despite more than one third of those panel members being Internally Displaced Peoples (IDPs), a fact that was hailed as a success in and of itself, despite signs of being potentially less convenient for affected individuals, who got at times annoyed by the repeated calls with no concrete outcome in their favor.[64] Relatedly, UNDP performed two pilot WhatsApp surveys focused on the needs, perspectives, fears and local conflict dynamics of host communities and Syrian refugees in Lebanon and found similar problems. UNDP recognized that it is almost impossible not to raise expectations when engaging on direct communication channels such as WhatsApp with very vulnerable communities, and compensated survey participants with phone credit for their time and data use "with the hope that this may somewhat offset the frustration with research work that does not provide any tangible benefits."[65]

The mVAM project is one of those concepts kickstarted by a Humanitarian Innovation Fund grant that benefited from several different types of partnerships over time, and a testimony of how these are often buried and even erased from main project pages when a system reaches maturity. Even if most pages related to the mVAM now show little to no reference to external actors, a 2015 Review of the mVAM programme indicates[66] that the project received substantial support from a variety of actors,

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[63] Von Engelhardt, Johannes, and Jones, Lindsey. Using mobile phone surveys to track resilience and post-disaster recovery: A how-to guide. (January 30, 2020). BRACED manual. https://reliefweb.int/report/world/using-mobile-phone-surveys-track-resilience-and-post-disaster-recovery-how-guide.

[64] Mock, Nancy; Morrow, Nathan; Papendieck, Adam; Curdumi Pendley, Sofia; and Hudson, Margaret. Review of mVAM programme: novel application of mobile technologies for food security monitoring. (August 2015). DISI report. https://documents.wfp.org/stellent/groups/public/documents/ena/wfp278999.pdf.

[65] WhatsApp Surveying Guide. (2018). UNDP. https://www.fsnnetwork.org/sites/default/files/2022-09/Whatsapp-Guide-Book.pdf.

[66] Mock, Nancy; Morrow, Nathan; Papendieck, Adam; Curdumi Pendley, Sofia; and Hudson, Margaret. Review of mVAM programme: novel application of mobile technologies for food security monitoring. (August 2015). DISI report. https://documents.wfp.org/stellent/groups/public/documents/ena/wfp278999.pdf.

including inSTEDD and Geopoll[67] as tech partners, or Cisco, Google, and others as donors, plus Nielsen as pro bono advisor on data collection design and implementation.[68]

Case study 2: GeoPoll

The same project review indicates GeoPoll as an important provider of sampling frames for mVAM and other clients, including the FAO Data in Emergencies (DIEM) Information System.[69] As part of mVAM, GeoPoll acquires cellular databases or attempts random digit dialing, provides cellular survey services for self-administered methods, and performs some assessment of the quality of the sampling frame that it provides in terms of coverage of service providers. But beyond being a recurrent humanitarian tech provider, GeoPoll also offers a glimpse into the risks hidden in striking tech partnerships with private companies. Officially listed as having the main operation center in Nairobi, Kenya and the main office in Washington, according to its privacy policy,[70] Geopoll is actually controlled by Mobile Accord[71] which is a U.S registered small business. Mobile Accord is a "real-time mobile survey platform, reaching a growing network of more than 50 million users in 20 countries worldwide on a deeply granular level and at unprecedented scale." The same denomination (Geopoll / Mobile Accord - MAI) is also currently used in the GeoPoll terms of services and even in the April 2023 registration as a UN Global Compact adherent company.[72] But the website for Mobile Accord - MAI, the controller, is no longer active and its operational status is filed as closed on Crunchbase.[73] The same company archives database reports that GeoPoll was involved in two additional mergers in a matter of just a few years. Mobile Accord - MAI was in fact bought out in 2015 by Rally4 (a fundraising support system company),[74] who was then acquired in 2019 by GRYTT (a social impact intelligence and management consultancy company).[75] There is no active website for any of these companies but GeoPoll, nor information about their management and their policies. The series of mergers seems to find value in Geopoll's data, metadata, and contact book, as well as

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[67] GeoPoll. (Last accessed in December 2023). Website. https://www.geopoll.com/.
[68] Revolutionizing Data Collection. (2015). The Nielsen Company report. https://documents.wfp.org/stellent/groups/public/documents/ena/wfp275609.pdf.
[69] FAO Data in Emergencies. (Last accessed in December 2023). Website. https://data-in-emergencies.fao.org/pages/faq.
[70] GeoPoll Privacy Policy. (Last accessed in December 2023). Website page. https://www.geopoll.com/privacy-policy/.
[71] Mobile Accord Product Page. (Last accessed in December 2023). CBInsight. https://www.cbinsights.com/company/mobile-accord.
[72] Mobile Accord Member Page. (Last accessed in December 2023). UN Global Compact. https://unglobalcompact.org/what-is-gc/participants/157122-Mobile-Accord-Inc-T-A-GeoPoll-.
[73] Mobile Accord. (Last accessed in December 2023). Crunchbase database page. https://www.crunchbase.com/organization/mobile-accord.
[74] Rally4. (Last accessed in December 2023). Crunchbase database page. https://www.crunchbase.com/organization/rally-4.
[75] GRYYT. (Last accessed in December 2023). Crunchbase database page. https://www.crunchbase.com/organization/gryyt.

in another Mobile Accord subsidiary called MGive,[76] that in 2005 introduced the first mobile donation platform tailored to U.S. nonprofit organizations. What happened to the humanitarian data, and how much and what types of data were held is not stated. Based on standard industry practice, we see a possibility that the data was sold and transferred as a company asset during the different mergers. Nor is it clear how many other companies might have obtained humanitarian contracts giving access to thousands of hard-to-obtain digital assets, only to resell them for a profit. What is clear, however, is that due to the lack of adequate due process procedures, humanitarian actors are collecting extremely sensitive data about vulnerable populations using services provided by a company that no longer officially exist, without even realizing it.

The reliable nature of mobile connectivity opened up the path to new, internet-based communication systems to enhance two- or multiple-way data collection and communication strategies. Some, like FrontlineSMS and Telerivet[77] in the U.S., or Africa's Talking[78] in Kenya, bet on the dominance of SMS and voice-based technologies in low-resource environments, and offer their services as cloud-based platforms, virtual number provider, APIs, or SMS-gateways to allow aid organizations to manage two-way channels, and deploy locally specific automated communication flows within a centralized global system.

Mobile services provided by communication companies for almost two decades allow local communities to share information about threats with humanitarian actors and UN peace operations,[79] or to subscribe to community alert systems as FrontlineSMS. In 2009, during outbreaks of violence in Nigeria , Clickatell[80] enabled broadcasting of SMS alerts and automated reply to queries about the security status by text message. In other cases, bulk text messages can also be sent out to help prevent violence as the NGO Sisi Ni Amani did thanks to Kenya Safaricom, which donated 50 million text messages during the 2013 election.[81] In Iraq, the Smile for Peace program by Ooredoo's AsiaCell tried

[76] Mobile Accord and Subsidiary mGive Announce New B Corporation Status. (February 16, 2011). PR Newswire.
https://www.prnewswire.com/news-releases/mobile-accord-and-subsidiary-mgive-announce-new-b-corporation-status-116303309.html.
[77] Telerivet. (Last accessed in December 2023). Website. https://www.telerivet.com/.
[78] Africa's Talking. (Last accessed in December 2023). Website. https://africastalking.com/.
[79] Esberg, Jane and Mikulaschek, Christoph. Digital Technologies, Peace and Security: Challenges and Opportunities for United Nations Peace Operations. (August 25, 2021). UN Peacekeeping article.
https://peacekeeping.un.org/sites/default/files/esberg_and_mikulaschek_-_conflict_peace_and_digital_technologies_-_v3_210825.pdf.
[80] Blyth, Mike. Missions Look To Sms In Nigeria. (June 4, 2009). Kiwanja blog post.
https://www.kiwanja.net/blog/2009/06/missions-look-to-sms-in-nigeria/.
[81] Safaricom Donates 50 Million SMS to Boost Poll Peace Initiative. (February 7th, 2013). Safaricom blog post.
https://www.safaricom.co.ke/media-center-landing/press-releases/safaricom-donates-50-million-sms-to-boost-poll-peace-initiative.

to keep communication running[82] within Iraq's conflict zones through a call center for IDPs and refugees run in cooperation with Iraqi NGO Civil Development Organization (CDO).

A handful of other companies took advantage of the explosive growth of social media and messaging systems, and of their very restrictive approach to business application programming interfaces (APIs),[83] to become business solutions providers (BSPs)[84]; these are also called 'omnichannel' when they offer to connect APIs of various messaging platforms. Through omnichannel platforms such as Twilio,[85] EngageSpark,[86] Clickatell,[87] or Infobip,[88] humanitarian actors have the possibility of engaging with anyone in the same way, on the communication channel of their choice (email, SMS, WhatsApp, etc). This lucrative Communication Platform as a Service (CPaaS) business model emerged when messaging companies such as WhatsApp decided to restrict some processes, such as surveying, which are now strictly regulated and reserved only to selected clients vetted by trusted partners: the omnichannel companies.

These providers play a relatively limited role when the user is only asking them to activate social media channels, for example. As soon as forms of automation or smart processes are involved, however, omnichannel platforms often step up their contribution, transforming the traditional engagement process into a cloud-first system. Here, additional actors might be needed to create more complex flows or to integrate customer relationship management tools, or remote cash and voucher assistance systems.

At the very least, these companies are de facto gatekeepers, brokering access to online messaging systems, but as projects evolve they become the key gateway for additional data intermediaries who might take care of the triaging, application, onboarding, and technical support of digital communication channels teams, often through their own cloud environment.

Twilio is by far the most active in the humanitarian space[89] and the omnichannel company who experienced the biggest growth in this space, counting on active partnerships with Télecom Sans

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[82] Underserved Communities. (Last accessed in December 2023). Ooredoo webpage. https://www.ooredoo.com/en/social_responsibility-esg/disaster_relief/.

[83] APIs are a type of software that sends information back and forth between a website or app and a user.

[84] Warnes, John. Meeting communities where they are — the increasing preference of messaging apps. (November 3, 2020). UNHCR Innovation Service Blog. https://medium.com/unhcr-innovation-service/meeting-communities-where-they-are-the-increasing-preference-of-messaging-apps-3338ee9ee957.

[85] Twilio. (Last accessed in December 2023). Website. https://www.twilio.com/en-us.

[86] EngageSpark WhatsApp Surveys. (Last accessed in December 2023). EngageSpark webpage. https://www.engagespark.com/whatsapp-surveys/.

[87] Clickatell. (Last accessed in December 2023). Website. https://www.clickatell.com/.

[88] Infobip. (Last accessed in December 2023). Website. https://www.infobip.com/.

[89] Nonprofits outpace the private sector in digital engagement. (2022). Twilio State of Nonprofit Digital Engagement Report 2022. https://www.twilio.org/content/dam/twilio-org/static-pages/sonder-2022/pdf/Twilio-org-State-of-Nonprofit-Digital-Engagement-Report-2022.pdf.

Frontières[90] on assisting Venezuelan refugees, International Rescue Committee (IRC)[91] on migration routes in Latin America, and especially with the Norwegian Refugee Council (NRC),[92] which developed more than 10 contact centers covering 27 countries and recording more than 3 million interactions. Twilio's success in striking partnerships over its competitors also lie in its licensing model: their 'pay per hour, rather than per user' offer reassures NGOs who may only ask their staff to login and take calls for a few hours, and on a rotational basis.

The humanitarian space is rich in extractive data collection and communication systems, while protection-inspired data platforms are a much rarer occurrence. One of such cases is the RedSafe platform[93] built in agile co-creation with AdNovum,[94] which aims to establish a reliable and secure digital link between the ICRC and people affected by humanitarian crises, and between affected individuals registered on the portal, based on the ICRC's business requirements and «Security and Privacy by Design» and Zero-Trust principles, also including two layers of encryption to secure information at rest and in transit. Another example is provided by Kobli,[95] an NRC paralegal information platform supported by Norway and the Cisco Foundation.[96] But the most widely known and established platform is the IRC-led Signpost project,[97] now existing under different names in over 18 countries and in several local languages.

One last use case of tech partnership for information gathering involves extracting mobile data information through physical extraction of data from hard drives, computers, mobile devices and other electronic devices. This model is a clear anomaly on the humanitarian side of technology, and so far the main example is provided by Cellebrite,[98] an Israeli company that helped the United Nations Investigative Team to Promote Accountability for Crimes Committed by Da'esh (UNITAD) in collecting

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[90] How Télécoms Sans Frontières helped Venezuelan refugees regain their lives via technology. (Last accessed in December 2023). Twilio webpage. https://customers.twilio.com/en-us/telecoms-sans-frontieres.
[91] Information as empowerment: How the International Rescue Committee gives people quick access to life-saving resources. (Last accessed in December 2023). Twilio webpage. https://customers.twilio.com/en-us/international-rescue-committee.
[92] How the Norwegian Refugee Council built 10+ Flex contact centers in 12 months to support refugees across the globe. (Last accessed in December 2023). Twilio webpage. https://customers.twilio.com/en-us/norwegian-refugee-council.
[93] RedSafe Platform. (Last accessed in December 2023). Website. https://redsafe.icrc.org/default-country-initial.
[94] RedSafe for the International Committee of the Red Cross. (Last accessed in December 2023). AdNovum webpage. https://www.adnovum.com/clients/redsafe-for-international-committee-of-the-red-cross.
[95] NRC Kobli. (Last accessed in December 2023). Website. https://ukraine.kobli.no/uk.
[96] Building the digital future for NRC's Information, Counseling and Legal Assistance programme. (Last accessed in December 2023). HIP webpage. https://hiplatform.org/icla.
[97] Signpost. (Last accessed in December 2023). Website. https://www.signpost.ngo/.
[98] Harnessing Advanced Technology in International Criminal Investigations. (Last accessed in December 2023). UN Investigative Team to Promote Accountability for Crimes Committed by Da'esh (UNITAD) report. https://www.unitad.un.org/sites/www.unitad.un.org/files/general/2105390-harnessing_advanced_technology_in_international_criminal_investigations_web10may_0.pdf.

evidence of war crimes by ISIL, and gathering documentation for the victims. This deployment is unusual also because of the provider, who is better known in the human rights sector for their support to border control activities,[99] to controversial and discriminatory asylum-seeking screening procedures,[100] for enabling abuse against human rights defenders[101] and activists,[102] and for having had the Bangladeshi Rapid Action Battalion (RAB) as a client,[103] a notorious paramilitary unit accused of carrying out extra-judicial killings, torture, and disappearances. This is yet another example of the jarring gaps in human rights due diligence processes by protection-oriented actors.

b. Moving the data: connectivity and cybersecurity

Most humanitarian data collection and management systems – excluding the cloud-based omnichannel platforms – are designed based on specific requirements, notably the need for offline use due to the lack of connectivity. This has concrete repercussions well beyond the simple choice of the system to be used, as it directly affects the power dynamics between aid actors and affected populations. By driving in, gathering data offline, exiting, and uploading the collected information in servers thousands of kilometers away, humanitarians perpetrate forms of extractivism and colonialism[104] that deny agency of whole communities over their data and overall digital dimension.

While better connectivity and access to the internet would not be a panacea against the root causes of this phenomenon, better digital access options for communities would at least allow the deployment of more equitable technologies, including two-way communication systems, digital portals, and databases. For their part, aid actors have quickly come to realize that mobile coverage and internet access are massive drivers for better humanitarian programming, especially in a shrinking humanitarian environment, while being cognizant of the risks hidden in the transfer of sensitive data through connectivity solutions in conflict-related crises.[105]

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[99] Watson, Ariel.Technology and Border Security in Europe. (August 14, 2018). Cellebrite blog post. https://cellebrite.com/en/technology-and-border-security-in-europe/.

[100] Surveillance Company Cellebrite Finds a New Exploit: Spying on Asylum Seekers. (April 3, 2019). Privacy International blog post. https://privacyinternational.org/long-read/2776/surveillance-company-cellebrite-finds-new-exploit-spying-asylum-seekers.

[101] Biddle, Sam, and Desmukh, Fahad. Phone-Cracking Cellebrite Software Used To Prosecute Tortured Dissident. (December 8, 2016). The Intercept article. https://theintercept.com/2016/12/08/phone-cracking-cellebrite-software-used-to-prosecute-tortured-dissident/.

[102] Hvistendahl, Mara. Chinese Police Kept Buying Cellebrite Phone Crackers After Company Said It Ended Sales. (August 26, 2021). The Intercept article. https://theintercept.com/2021/08/26/cellebrite-china-cellphone-hack/.

[103] Oded, Yaron. Israeli Cellebrite Sold Spy-tech to Bangladesh 'Death Squad'. (March 9, 2021). Haaretz. https://www.haaretz.com/israel-news/tech-news/2021-03-09/ty-article/.highlight/israeli-cellebrite-sold-spy-tech-to-bangladesh-death-squad/0000017f-e592-da9b-a1ff-edff29cf0000.

[104] Madianou, Mirca. Technocolonialism: Digital Innovation and Data Practices in the Humanitarian Response to Refugee Crises. (July 26, 2019). Social Media + Society article. https://journals.sagepub.com/doi/10.1177/2056305119863146.

[105] Connectivity as Aid (2020). In Handbook on data protection in humanitarian action - 2nd Edition. ICRC. https://www.icrc.org/en/data-protection-humanitarian-action-handbook.

Historically,[106] humanitarian actors have invested efforts and resources to ensure their own continuous access to telecommunication systems even "when normal communication facilities are interrupted or not available,"[107] mostly through wireless telecommunication (usually very high frequency radio) and more recently using satellite communications (SatComms). A whole sector responded to the call, led by companies such as Iridium,[108] Inmarsat,[109] Ericsson,[110] Cisco,[111] Thuraya,[112] Eutelsat,[113] and ITC Global,[114] but their use remains largely restricted to humanitarian actors and their vetted partners when they can afford it.

Given the specificities of the humanitarian context and the persistence of a strong influence by aerospace and defense companies - which in 2022 represent 36% of the investments poured into the satellite sector[115] - the market continues to intensely overlap with the military. This raises challenges on the opportunity and ethics of building communication systems that rely more and more exclusively on military-adjacent systems to transfer affected individuals' data and conflict-sensitive information, a concern shared by the United Nations Office for Outer Space Affairs (UNOOSA).[116] This is even more problematic if we consider that beyond the SatComm service, there is a whole tech ecosystem involved in satellite data management, ensuring image, voice, or signal processing, detection, data integration and interpretation, platform and cloud services.[117]

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[106] The Red Cross and its emergency Radiocommunications. (January 5, 1965). ICRC. https://international-review.icrc.org/sites/default/files/S002086040000190Xa.pdf.
[107] Use of two-way wireless telecommunications by the International Red Cross and Red Crescent Movement, Resolution 10. (December 31, 2000). International Review of the Red Cross article. https://www.icrc.org/en/doc/resources/documents/article/other/57jqt7.htm.
[108] Global Governments: Humanitarian. (Last accessed in December 2023). Iridium webpage. https://www.iridium.com/markets/humanitarian/.
[109] Inmarsat. (Last accessed in December 2023). Website. https://www.inmarsat.com/en/index.html.
[110] Ericsson Response. (Last accessed in December 2023). Website. https://www.ericsson.com/en/about-us/sustainability-and-corporate-responsibility/digital-inclusion/humanitarian-response.
[111] Cisco Crisis Response. (Last accessed in December 2023). Website. https://www.cisco.com/c/en/us/about/csr/impact/cisco-crisis-response.html.
[112] Frąckiewicz, Marcin. The Impact of Thuraya Satellites on Disaster Relief and Humanitarian Aid. (19 March, 2023). TS2 Space blog post. https://ts2.space/en/the-impact-of-thuraya-satellites-on-disaster-relief-and-humanitarian-aid/#gsc.tab=0.
[113] Connecting Sustainably. (Last accessed in December 2023). Eutelsat webpage. https://www.eutelsat.com/en/group/corporate-responsibility.html.
[114] NGO. (Last accessed in December 2023). ITC Global webpage. https://www.itcglobal.com/your-industry/ngo/.
[115] Expanding frontiers. (Last accessed in December 2023). Strategy& paper. https://www.strategyand.pwc.com/uk/en/insights/expanding-frontiers-down-to-earth-guide-to-investing-in-space.html.
[116] Benefits of Space: International Peace and Security. (Last accessed in December 2023). UNOOSA. https://www.unoosa.org/oosa/en/benefits-of-space/international-peace-and-security.html.
[117] Sacchi. Satellites for Humanitarian Aid. (2023). Intersos. https://www.intersos.org/wp-content/uploads/2023/11/Sacchi-Satellites-for-humanitarian-aid.pdf.

Despite this, the potential for SatComm in the aid sector is widely recognized, including by the UNOOSA.[118] More specifically, the engagement of the private sector already allowed important innovations in the field, ranging from the increasingly small and performant satellite phones to the replacement of bulky terminals with backpack-sized three-part systems which can be installed, without training or specific tools, in just 15 minutes, providing aid workers in the field with reliable and effective broadband connectivity.[119]

Commonly, the activation of these public-private partnerships is done through coordination bodies such as the Emergency Telecommunication Cluster[120] led by the World Food Programme (WFP). In turn, the ETC is part of the Crisis Connectivity Charter[121] that also includes the EMEA Satellite Operator's Association (ESOA) and the Global Satellite Operators Association (GSOA),[122] in coordination with the UN Office for the Coordination of Humanitarian Affairs (OCHA). Sometimes, connectivity support to responders and authorities is also provided by the International Telecommunication Union (ITU) upon request by Member States, by deploying satellite telephones and terminals as well as other emergency telecommunications equipment, often in partnership with some of the above mentioned companies. The ITU also tracks satellite orbits, in an increasingly important effort to avoid catastrophic collisions.

The past decade has seen a growing consensus that "information is aid"[123] and that, conversely, the lack of information can be lethal. The recent indiscriminate military attacks by the Israeli army in Gaza were regularly preceded by complete shutdowns[124] that contributed to the insecurity of the local population, spread panic, and hampered humanitarian response to a point that pushed a coalition of digital rights NGOs[125] and several key humanitarian actors to call for connectivity to be restored.[126]

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[118] Benefits of Space: International Peace and Security. (Last accessed in December 2023). UNOOSA. https://www.unoosa.org/oosa/en/benefits-of-space/international-peace-and-security.html.

[119] Changing the face of in-the-field connectivity for the humanitarian sector. (July 11, 2017). MyNewsDesk Eutelsat blog post. https://www.mynewsdesk.com/eutelsat/blog_posts/changing-the-face-of-in-the-field-connectivity-for-the-humanitarian-sector-59618.

[120] ETC. (Last accessed in December 2023). Website. https://www.etcluster.org.

[121] UN Crisis Connectivity Charter. (Last accessed in December 2023). ETC factsheet. https://www.etcluster.org/sites/default/files/documents/ESOA-UN-Charter-Doc-v2_0.pdf.

[122] GSOA. (Last accessed January 2024). Website. https://gsoasatellite.com/.

[123] Information as aid itself. (July 23, 2009). The Guardian. https://www.theguardian.com/advocacy/british-red-cross.

[124] Fatafta, Marwa; Sibai, Ali; Rosson, Zach; Mnejja, Kassem; Kreitem, Hanna; and Cheng, Sage. Palestine unplugged: how Israel disrupts Gaza's internet. (November 14, 2023). Access Now. https://www.accessnow.org/publication/palestine-unplugged/.

[125] Joint statement: Restore telecoms and internet connectivity in Gaza now!. (October 20, 2023). Access Now. https://www.accessnow.org/press-release/statement-telecoms-internet-connectivity-in-gaza/.

[126] The Gaza Strip: Unrwa Finally Receives Fuel; Much More Is Needed For Humanitarian Operations. (November 18, 2023). UNRWA. https://www.unrwa.org/newsroom/official-statements/gaza-strip-unrwa-finally-receives-fuel-much-more-needed-humanitarian.

Over the past decade, building on the expected staggering increases in connectivity coverage,[127] countless humanitarian initiatives aiming at bridging the digital divide have flourished and floundered, very often starting with ambitious objectives set by the development sector such as "connecting the unconnected"[128] before falling back to one-off internet centers and digital literacy training.[129]

As shown by the UNHCR-led Connectivity for Refugees pledge,[130] the connectivity challenge is much bigger than any single humanitarian organization, and depends on legal, financial, regulatory, and even military factors,[131] more than on technical ones.[132] This all contributes to making connectivity a wicked problem to solve in an armed conflict, as rapid connectivity responses are costly, politically sensitive, and often unsustainable beyond the short timeframe of a rapid response. These are some of the reasons why community connectivity remains a neglected item in the list of humanitarian priorities even when it is in very high demand by affected populations. Yet, the need for free and unrestricted access to information and communication systems is well known and documented by humanitarian actors,[133] along with the laudable concept of humanitarian access as a two-way process[134] that applies equally in the physical and information space.[135]

In fact, despite being less visible than others in the global discussion about bringing connectivity to humanitarian action, the main actor consistently providing communication and internet services in

[127] 5G Global Launches & Statistics. (Last accessed in December 2023). GSMA. https://www.gsma.com/futurenetworks/ip_services/understanding-5g/5g-innovation/.
[128] World Humanitarian Day: The critical role of ICTs. (August 19, 2021). ITU press release. https://www.itu.int/hub/2021/08/world-humanitarian-day-the-critical-role-of-icts/.
[129] Balestra, Giulia. When innovation is yet another Connected Community Centre: Connectivity at the margins of innovation. (May 17, 2019). UNHCR Innovation Service. https://medium.com/unhcr-innovation-service/when-innovation-is-yet-another-connected-community-centre-connectivity-at-the-margins-6bcb4227fc54.
[130] Connectivity for Refugees. (Last accessed in December 2023). Website. https://refugeeconnectivity.org/.
[131] This covers both the disruption of access to the internet and communication infrastructure by conflict actors (Rizk, Joelle and Cordey, Sean. What we don't understand about digital risks in armed conflict and what to do about it. (July 27, 2023). Humanitarian Law & Policy blog. https://blogs.icrc.org/law-and-policy/2023/07/27/digital-risks-in-armed-conflict/) and the integration of civilian communication systems with warfare (Horbyk, Roman. "The war phone": mobile communication on the frontline in Eastern Ukraine (October 21, 2022). Digi War. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9589852/)
[132] Collaboration for Connectivity. (May 2020). UNHCR Innovation Service. https://www.unhcr.org/innovation/wp-content/uploads/2020/06/Collaborating-for-Connectivity_WEB062020.pdf.
[133] The Digital Leisure Divide and the Forcibly Displaced. (April 2023). UNHCR Innovation Service. https://www.unhcr.org/innovation/wp-content/uploads/2023/04/The-Digital-Leisure-Divide-Field-Research.pdf.
[134] Handbook for the Protection of Internally Displaced Persons. (June 2010). Global Protection Cluster. https://www.refworld.org/docid/4790cbc02.html.
[135] Sacchi. Satellites for Humanitarian Aid. (2023). Intersos. https://www.intersos.org/wp-content/uploads/2023/11/Sacchi-Satellites-for-humanitarian-aid.pdf.

crisis affected areas remains the telecommunication sector.[136] Some private sector experts we interviewed attributed the humanitarian and tech obsession with 'delivering connectivity' – especially in light of the limited resources usually allocated to this type of activity – to a form of hubris, and hinted that they do not believe it should be aid organizations' job to manage connectivity systems, which sit in a lucrative and complex market deeply ingrained in local infrastructure, economy, and regulations.

UNHCR seemed to have already reached a similar conclusion years ago, and conceded that in efforts to facilitate community connectivity, sustainability strategies realistically have to incorporate a component of aid financing as part of a market-oriented ecosystem. There can be a "good business case" for integrating private mobile operators.[137]

To improve and facilitate coordination between the aid and mobile sector, the GSMA, a global association representing more than 1,000 mobile network operators (MNOs),[138] also promotes humanitarian-oriented partnerships as part of its mandate. Many of its members joined its Humanitarian Connectivity Charter, and its Mobile for Humanitarian Innovation promotes "life-enhancing mobile-enabled services during humanitarian preparedness, response and recovery.[139] GSMA staff join key humanitarian fora such as the Emergency Telecommunications Cluster (ETC), the CALP Network,[140] and the Risk-informed Early Action Partnership (REAP)."[141]

The main areas where private operators focus when interacting with nonprofits are those partnerships aimed at bringing connectivity to affected populations, mobile-based assistance and money solutions, access to utilities, and information as aid. The space for humanitarian partnerships can shrink when situations of violence break out, because business continuity takes over as an absolute priority in the middle of a crisis threatening their personnel, assets, and services.

As striking partnerships with local telcos during a conflict is much harder, the experts interviewed suggest building resilience-focused relationships before a crisis hits. In war zones, MNOs focus on resilience, keeping their staff safe, and – prior to a crisis – on building or seeking redundancy to

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[136] How to Work With Mobile Network Operators — Lessons from Tanzania. (Nov 10, 2018). UNHCR Innovation Service. https://medium.com/unhcr-innovation-service/how-to-work-with-mobile-network-operators-lessons-from-tanzania-5c0159cec43b.

[137] Balestra, Giulia. Connectivity for Refugees: What have we learned?. (Aug 26, 2019). UNHCR Innovation Service. https://medium.com/unhcr-innovation-service/connectivity-for-refugees-what-have-we-learned-58c72dae38c2.

[138] GSMA. (Last accessed in December 2023). Website. https://www.gsma.com/.

[139] Humanitarian Connectivity Charter. (Last accessed in December 2023). Website. https://www.gsma.com/mobilefordevelopment/mobile-for-humanitarian-innovation/humanitarian-connectivity-charter/.

[140] CALP. (Last accessed in December 2023). Website. https://www.calpnetwork.org/.

[141] Risk-informed Early Action Partnership. (Last accessed in December 2023). Website. https://www.early-action-reap.org/.

prevent or mitigate any damage to their systems, infrastructure, and networks in case of a shock. But even when research on gaps and needs seem solid, like in Sudan,[142] when the conflict starts all efforts focus on ensuring business continuity. Existing agreements or plans can be halted if the companies are ordered to shut down the service or activities.[143]

International aid actors – including UNHCR – are still trying to mainstream connectivity as part of their emergency programming, despite the many challenges to their efforts.[144] In 2023, UNHCR, the ITU and the GSMA launched a new initiative to ensure all major refugee hosting areas have available and affordable connectivity by 2030.[145] Umbrella organizations and consortia like NetHope have gained expertise in setting up connectivity partnerships among nonprofit and private members in migration and displacement contexts,[146] but have not addressed the core challenge of restoring or setting up networks in areas of active humanitarian crisis. Recently, ETC reintroduced a 'service for communities' pillar to their strategy[147] trying to concretize what had been identified as a strategic priority more than a decade ago,[148] but thus far this effort seems to have remained largely on paper.

Tech companies have also met the same disappointing result when trying alone to provide creative tech solutions to essentially non-tech problems, as shown by the short-lived Google Loon,[149] or Facebook Free Basics/Discover and the whole FB Connectivity Lab.[150] Overall, despite their resources and outreach, the intervention of global digital companies such as Meta and Alphabet seem to have failed in providing innovative solutions to fill the humanitarian digital gap in connectivity, focusing

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[142] The Humanitarian Connectivity, Needs and Usage Assessments (CoNUA) Toolkit. (Last accessed in December 2023). GSMA webpage. https://www.gsma.com/mobilefordevelopment/conua/.

[143] Kapiyo, Victor. How Telecom Companies in Africa Can Respond Better to Internet Disruptions. (March 22, 2021). CIPESA blog post. https://cipesa.org/2021/03/how-telecom-companies-in-africa-can-respond-better-to-internet-disruptions/.

[144] Balestra, Giulia. Connectivity for Refugees: What have we learned?. (Aug 26, 2019). UNHCR Innovation Service. https://medium.com/unhcr-innovation-service/connectivity-for-refugees-what-have-we-learned-58c72dae38c2.

[145] 'Refugee connectivity – a bold approach to connect millions forced to flee'. (July 4, 2023). UNHCR – ITU Joint Press Release. https://www.unhcr.org/news/announcements/refugee-connectivity-bold-approach-connect-millions-forced-flee. For more details on the initiative, see Connectivity for Refugees: The Foundations of a 21st Century Humanitarian Response. (2023). UNHCR. https://refugeeconnectivity.org/wp-content/uploads/Connectivity-for-Refugees-A-21st-Century-Humanitarian-Response.pdf.

[146] Connectivity and Infrastructure. (Last accessed in December 2023). Nethope webpage. https://nethope.org/programs/connectivity-and-infrastructure/.

[147] Services for Communities (S4C). (Last accessed in December 2023). ETC webpage. https://www.etcluster.org/services/services-communities-s4c.

[148] A New Strategy for Humanitarian Connections. (2015). ETC webpage. https://www.etcluster.org/project/etc2020.

[149] Loon - Expanding internet connectivity with stratospheric balloons. (Last accessed in December 2023). Webpage. https://x.company/projects/loon/.

[150] Announcing the Connectivity Lab at Facebook. (March 27, 2014). Meta. https://about.fb.com/news/2014/03/announcing-the-connectivity-lab-at-facebook/.

instead on more discreet commercial-scale, hard engineering projects without any pretense of philanthropy.[151]

Local grassroots organizations are often unsung champions in the humanitarian connectivity effort, as shown in Yemen by the Internet Society local chapter in collaboration with the Watan Foundation for Development and Training.[152] This is also recognized by global organizations such as UNHCR, which started exploring the potential of community-led connectivity as early as 2020.[153] Hybrid and more agile nonprofit organizations, mixing technical core expertise and a nonprofit mandate, have also carved out expertise in support to other generalist NGOs or directly to local communities. For example, Télecom sans Frontières (TSF) regularly supports humanitarian actors like Alima, HALO Trust, Moto Help, and AICM in Ukraine, and affected populations.[154] In Moldova, TSF installed WiFi hotspots on IOM and UNHCR buses to allow those fleeing from Ukraine to Romania to stay connected. Their intervention is coordinated with the relevant bodies such as ETC, ASEAN, and OCHA, and supported by a strong line up of companies including Vodafone Foundation,[155] Inmarsat, Eutelsat, AT&T, PCCW Global,[156] and DigitalBridge,[157] among others.

On a larger scale, in an effort to connect schools across the world to the internet, UNICEF's GIGA initiative[158] adopted a systemic approach, partnering with ITU and with companies from the telecommunication and information management tech sectors including the Ethereum Foundation, Launchnodes, Liquid Telecom and IHS Towers, one of the largest telecommunications infrastructure providers and the fourth largest independent multinational tower company globally.[159] However, while this initiative might be a way to strengthen local capacity and resilience in the face of potential future challenges, it does not directly address the immediate needs of communities in ongoing crises.

[151] Hoskins, Guy T. Decoding Meta's Infrastructural Turn in Africa: Access with Strings. (November 27, 2023). Bot Populi. https://botpopuli.net/decoding-metas-infrastructural-turn-in-africa-access-with-strings/.
[152] Kende, Michael. Developing Readiness for Community Networks in the Middle East and North Africa. (Last accessed in December 2023). Internet Society report. https://www.internetsociety.org/wp-content/uploads/2023/01/Readiness-for-Community-Networks-in-MENA-EN.pdf.
[153] Community-led Connectivity. (May 2020). UNHCR Innovation Service. https://www.unhcr.org/innovation/wp-content/uploads/2020/05/Community-led-Connectivity-WEB052020.pdf.
[154] Réponse d'urgence pour les populations affectées par la guerre. (November 29, 2023). TSFI webpage. https://www.tsfi.org/fr/nos-missions/reponse-d-urgence/crise-ukrainienne.
[155] Mobile Network Restoration & Humanitarian Response. (2014). GSMA. https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2014/02/Mobile-Network-Restoration-and-Humanitarian-Response.pdf.
[156] PCCW Global. (Last accessed in December 2023). Website. https://www.pccwglobal.com/.
[157] Our Partners. (Last accessed in December 2023). Digitalbridge webpage. https://www.digitalbridge.com/responsibility#responsibility-our-partners.
[158] About us. (Last accessed in December 2023). GIGA webpage. https://giga.global/about-us/.
[159] IHS Towers partners with UNICEF to accelerate school connectivity mapping. (January 24, 2023). UNICEF. https://www.unicef.org/partnerships/ihs-towers-partners-unicef-accelerate-school-connectivity-mapping.

On the private side, more intentional companies in their engagement in the telecommunication sector have shown stronger results in innovating the field, from MNOs to satellite groups. There is a clear opportunity ahead for humanitarian uses of low earth orbit (LEO) satellite connectivity, possibly not through the direct-to-consumer retail model offered by Starlink (SpaceX) and Project Kuiper (Amazon),[160] but rather through wholesale initiatives[161] such as Eutelsat OneWeb,[162] Telesat Lightspeed,[163] the EU's planned IRIS2 constellation,[164] among others. Meanwhile, in the more established and still improving geostationary orbit system, that is also allowing individual countries from Global Majority such as Angola (Angosat-2),[165] Nigeria (Eutelsat Konnect)[166] and South Sudan (Yahclick)[167] to set up their own systems based on local needs. Experts see the expanding role of satellite connectivity – regardless of the altitude – as complementing rather than replacing terrestrial options especially in rural areas, opening up new opportunities for more resilient and emergency-ready communications but also creating new challenges for cybersecurity.

Case study 3: Starlink

In line with owner Elon Musk's strategy to rely more on headline-grabbing stunts rather than traditional marketing campaigns, SpaceX's Starlink has repeatedly been at the center of the public discussion in the humanitarian sector as a supposed silver-bullet solution to first line connectivity, raising wild expectations about its potential role. The most documented deployment of Starlink technology as part of humanitarian response has been in Ukraine, and it was controversial enough to deserve its own Wikipedia entry.[168] While often shown as an example of the potential for rapid deployment of portable satellite connectivity in offline conditions, the company was actually

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[160] Project Kuiper. (Last accessed in December 2023). Amazon webpage.
https://www.aboutamazon.com/what-we-do/devices-services/project-kuiper.
[161] Song, Steve. Starlink and Inequality. (November 6, 2023). Many Possibilities blog post.
https://manypossibilities.net/2023/11/starlink-and-inequality/.
[162] Eutelsat OneWeb. (Last accessed in December 2023). Website. https://oneweb.net/.
[163] Telesat Lightspeed. (Last accessed in December 2023). Website.
https://www.telesat.com/leo-satellites/.
[164] IRIS²: the new EU Secure Satellite Constellation. (Last accessed in December 2023). European Commission webpage. https://defence-industry-space.ec.europa.eu/eu-space-policy/iris2_en.
[165] ANGOSAT-2 connects more than 150 locations across the country. (October 10, 2023). Angop press release.
https://www.angop.ao/en/noticias/tecnologia/angosat-2-conecta-mais-de-150-localidades-do-pais/.
[166] Eutelsat Konnect partners Coollink to reshape Satellite Internet in Nigeria. (October 17, 2023). Business Day article.
https://businessday.ng/companies/article/eutelsat-konnect-partners-coollink-to-reshape-satellite-internet-in-nigeria/.
[167] Thuraya, YahClick and G4T to support connectivity in South Sudan. (October 23, 2023). Developing Telecoms article.
https://developingtelecoms.com/telecom-technology/satellite-communications-networks/15671-thuraya-yahclick-and-g4t-to-support-connectivity-in-south-sudan.html.
[168] Starlink in the Russo-Ukrainian War. (Last accessed in December 2023). Wikipedia entry.
https://en.wikipedia.org/wiki/Starlink_in_the_Russo-Ukrainian_War.

months into discussing the possible entry in the Ukrainian market with the government before Russia's full scale invasion started.[169] As such, the rapid deployment of Starlink was more the result of a hastened political decision under pressure[170] with most technical requirements already in place, rather than a full demonstration of the humanitarian response capabilities of the system in any context. The company allowed the deployment of their terminals in areas outside of active conflict zones by individuals for peaceful purposes and tolerating indirect military support, but while local communities hailed them as a lifeline for communication, their effective role in humanitarian response by aid organizations remains unclear. Starlink accepted payment by the United States, Poland, the UK, and others for the initial terminals delivered, before demanding the U.S. Dept. of Defense provides further funding.[171] Of the around 42000 Starlink terminals hosted by the country according to the Ministry of Digital Transformation of Ukraine,[172] OCHA and UNDP were using only a few until late 2022, by then WFP had already returned their hardware and were applying for licenses needed to install a VSAT, and UNHCR never used them at all. By October 2023, the ETC monthly report focused on VSAT and VHF radio systems (including an application for in-kind donation by Cisco),[173] and only mentions Starlink as part of an Remote Site on Vehicle (RSoV) experiment — a pilot mobile VHF radio solution that can provide secure communications in UN armored vehicles deployed on mission in high-risk areas.[174] The system relies on a modified Starlink terminal and the RSoV kit box with radio and electrical equipment, and was pre-cabled on vehicles for WFP, IOM, OCHA. It is unclear how many UN-controlled terminals are still active to this day, and the overall assessment of their performance. The company was very discreet in commenting on any formal engagement for humanitarian response with aid actors, and did not seem open to requests by other humanitarian organizations to deploy in other humanitarian crises. Despite opening up new deployment options to users, Starlink is affected by the challenges of conflict zones: Starlink's terminals were flagged as unsafe and easily targeted by tracking their source signal,[175] and posed

[169] Antoniuk, Daryna. How Elon Musk's Starlink satellite internet keeps Ukraine online. (Last accessed in December 2023). Kyiv Independent article.
https://kyivindependent.com/how-elon-musks-starlink-satellite-internet-keeps-ukraine-online/.
[170] Boichak, Olga, and Lokot, Tetyana. Billionaires Won't Save Ukraine's Internet. (November 20, 2022). Foreign Policy article.
https://foreignpolicy.com/2022/11/20/ukraine-russia-war-internet-musk-starlink-space-x/.
[171] Marquardt, Alex. Exclusive: Musk's SpaceX says it can no longer pay for critical satellite services in Ukraine, asks Pentagon to pick up the tab. (October 14, 2022). CNN article.
https://edition.cnn.com/2022/10/13/politics/elon-musk-spacex-starlink-ukraine/index.html.
[172] How Decentralization Saved The Ukrainian Internet: Lessons From 2022, Government Officials And Telecom Industry Reflect In Kyiv. (Last accessed in December 2023). eQualitie blog entry.
https://equalit.ie/decentralization-saved-the-ukrainian-internet/.
[173] ETC Situation Report #28. (November 2, 2023). ETC.
https://www.etcluster.org/document/etc-ukraine-situation-report-october-2023.
[174] Id.
[175] Ils ont découvert une fonction cachée du réseau de satellites Starlink. (November 8, 2023). Frandroid article.
https://www.frandroid.com/telecom/1850211_ils-ont-decouvert-une-fonction-cachee-du-reseau-de-satellites-starlink.

risks to civilians due to their dual use for military and humanitarian purposes,[176] a concern that pushed SpaceX to branch out a dedicated defense industry program.[177] Compared to other providers such as Viasat (that powered Ukraine before being outed by a cyberattack on February 24,[178] an hour before the Russian invasion), Starlink is reportedly more resistant to cyberattacks and jamming,[179] but not necessarily to hacking attempts.[180] So far, the promised agility of Starlink comes at a staggering cost that remains out of reach for most non-governmental aid actors,[181] exposes users to potential retaliation in several countries involved in conflict such as Russia or Yemen,[182] and raises issues on its compatibility with the humanitarian principles due to the opaque business model and mercurial governance of SpaceX alliances.

In the mentioned Ukraine response, the full-scale invasion by Russian military forces in Feb. 2022 was accompanied by cyberwarfare ops against military and civilian objectives, including Internet Service Provider (ISP) and humanitarian targets,[183] as reported by the Microsoft Threat Intelligence Center (MSTIC)[184] and Cloudflare.[185] Recent studies have confirmed[186] what humanitarians already know: NGOs are attractive targets (the second most targeted industry by nation-state attacks) because of the sensitive data they handle daily, including political, ethnic, religious, or financial information.[187]

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[176] How Elon Musk's satellites have saved Ukraine and changed warfare. (January 5, 2023). The Economist article. https://www.economist.com/briefing/2023/01/05/how-elon-musks-satellites-have-saved-ukraine-and-changed-warfare.

[177] Starshield. (Last accessed in December 2023). SpaceX webpage. https://www.spacex.com/starshield/.

[178] Case Study: Viasat. (Last accessed in December 2023). CyberPeace Institute webpage. https://cyberconflicts.cyberpeaceinstitute.org/law-and-policy/cases/viasat.

[179] Duffy, Kate. A top Pentagon official said SpaceX Starlink rapidly fought off a Russian jamming attack in Ukraine. (April 22, 2022). Business Insider article. https://www.businessinsider.com/spacex-starlink-pentagon-russian-jamming-attack-elon-musk-dave-tremper-2022-4?r=US&IR=T.

[180] Burgess, Matt. The Hacking of Starlink Terminals Has Begun. (August 10, 2022). Wired article. https://www.wired.co.uk/article/starlink-internet-dish-hack.

[181] Auslender, Viki. Rethinking satellite internet projects: Are Starlink and Amazon truly serving the public?. (July 27, 2023). Calcalist article. https://www.calcalistech.com/ctechnews/article/sju9cwpc3.

[182] Elon Musk's satellite internet provokes the Houthis' fear of breaking their monopoly on service in Yemen. (March 17, 2023). Newsyemen article. https://www.newsyemen.net/new/83111.

[183] ETC Ukraine Sitrep #15. (October 3, 2022). ETC. https://www.etcluster.org/document/etc-ukraine-sitrep-15-30-september.

[184] ACTINIUM targets Ukrainian organizations. (February 4, 2022). Microsoft. Blog post https://www.microsoft.com/en-us/security/blog/2022/02/04/actinium-targets-ukrainian-organizations/.

[185] Cloudflare cyber security protection for at-risk sites. (Last accessed in December 2023). Cloudflare webpage. https://www.cloudflare.com/galileo/.

[186] Greig, Jonathan. Microsoft announces security programs for nonprofits as nation-state attacks increase. (October 21, 2021). ZDNET article. https://www.zdnet.com/article/microsoft-announces-security-programs-for-nonprofits-as-nation-state-attacks-increase/.

[187] Delaney, Kevin. Protecting aid workers from the crosshairs of hackers. (September 05, 2023). Cisco blog post. https://newsroom.cisco.com/c/r/newsroom/en/us/a/y2023/m09/protecting-aid-workers-from-the-crosshairs-of-hackers.html.

Unfortunately, humanitarians are far from up to the challenge: The last few years have provided several wake up calls for humanitarians about the safety and security of their networks, or the lack thereof. The 2019 UN hack,[188] the 2022 ICRC breach,[189] and the 2023 NRC cyberattack[190] proved the truth of the colorful claim that humanitarians "have the resources of mall cops to protect against the cyber hacking equivalent of Delta Force."[191] Likewise, NetHope finds its members to be aware of cyberthreats, but "their information security activities score in the inadequate zone. Most are only able to be reactive, and even when they do react, their responses are inefficient, inconsistent, and ad-hoc."[192] Companies are often called to step in and fill this gap, as in the Okta-supported Global Information Sharing and Analysis Center (ISAC) coordinated by Nethope with support from CyberPeace Institute and USAID.[193]

On the programmatic level, in Ukraine, the monthly ETC SitReps regularly mention the efforts of Cisco teams to ensure cyber protection[194] through their Umbrella system,[195] and to provide weekly network cyber security reports. Since the full-scale invasion in Feb. 2022, the biggest tech companies (Microsoft,[196] Meta,[197] Google[198]) have engaged in cybersecurity efforts. Their work also protects humanitarian actors, although not without ethical dilemmas, as the role these companies play is often

[188] Parker, Ben. EXCLUSIVE: The cyber attack the UN tried to keep under wraps. (January 29, 2020). The New Humanitarian article. https://www.thenewhumanitarian.org/investigation/2020/01/29/united-nations-cyber-attack.
[189] Cyber attack on ICRC: What we know. (February 16, 2022). The New Humanitarian article. https://www.icrc.org/en/document/cyber-attack-icrc-what-we-know.
[190] Cyberattack on Norwegian Refugee Council online database. (July 13, 2023). NRC press release. https://www.nrc.no/news/2023/july/cyberattack-on-norwegian-refugee-council-online-database/.
[191] Elliott, Vittoria. Humanitarian organizations keep getting hacked because they can't spend to secure data. (February 3, 2022). Rest of the World article. https://restofworld.org/2022/humanitarian-organizations-hack/.
[192] Digital Protection Program. (Last accessed in December 2023). Nethope webpage. https://nethope.org/programs/digital-protection-and-cybersecurity/digital-protection-program/.
[193] NetHope, USAID, and Okta establishing an Information Sharing and Analysis Center with support from CyberPeace Institute. (September 8, 2022). Nethope press release. https://nethope.org/press-releases/nethope-usaid-and-okta-establishing-an-information-sharing-and-analysis-center-with-support-from-cyberpeace-institute/.
[194] ETC Ukraine Factsheet 2023. (July 28, 2023). ETC. https://www.etcluster.org/document/etc-ukraine-factsheet-2023.
[195] Ukraine, conflict - Global ETC Teleconference #14. (September 29, 2023). ETC. https://www.etcluster.org/sites/default/files/documents/ETC%20Ukraine%20Global%20Partners%20Teleconference_minutes_2022_09_29%20%2314.pdf.
[196] Smith, Brad. Digital technology and the war in Ukraine. (February 28, 2023). Microsoft blog post. https://blogs.microsoft.com/on-the-issues/2022/02/28/ukraine-russia-digital-war-cyberattacks/.
[197] Wong, Queenie. Meta: Attacks 'Intensifying Sharply' Since Russia's Invasion of Ukraine. (April 7, 2022). CNET article. https://www.cnet.com/tech/services-and-software/meta-attacks-intensifying-sharply-since-russias-invasion-of-ukraine/.
[198] Venables, Phil. Google Cloud's security and resiliency measures for customers and partners. (March 3, 2022). Google Cloud blog post. https://cloud.google.com/blog/products/identity-security/how-google-cloud-is-helping-those-affected-by-war-in-ukraine.

not a neutral one.[199] By comparison, see the level of corporate engagement in other, less geopolitically and financially-prioritized crises such as Sudan, where the ETC SitReps[200] barely mention tech companies apart from the local telcos, app stores do not operate,[201] and up-to-date hardware from some major tech companies are not commonly available[202] We hope the release of a general license in 2023, lifting some sanctions on ICT equipment and software aimed at humanitarian applications, may yield greater access.[203]

Cyber threats could drive a further wedge in the power imbalance between organizations from the Global Minority and those from the Global Majority, often far removed from the centers of power in cybersecurity. In response, some companies such as Microsoft are launching dedicated programmes tailored to charities and nonprofits,[204] but so far this seems to be driven by market dominance rather than humanitarian motives.

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[199] As Tanks Rolled Into Ukraine, So Did Malware. Then Microsoft Entered the War. (February 28, 2022) The New York Times article. https://www.nytimes.com/2022/02/28/us/politics/ukraine-russia-microsoft.html.
[200] Sudan Key Documents. (Last accessed in December 2023). ETC webpage. https://www.etcluster.org/countries/11730/documents.
[201] Availability of Apple Media Services. (Last accessed in December 2023). Apple Support webpage. https://support.apple.com/en-us/HT204411.
[202] How to buy Apple products in Sudan? (August 14, 2020). Apple Forum webpage. https://discussions.apple.com/thread/251691343.
[203] OFAC Issues New General Licenses for Sudan. (June 8th, 2023). Charity & Security Network blog. https://charityandsecurity.org/news/ofac-issues-new-general-licenses-for-sudan.
[204] Introducing the Security Program for Nonprofits. (Last accessed in December 2023). Microsoft webpage. https://nonprofits.tsi.microsoft.com/en-US/introducing-the-security-program-for-nonprofits/.

c. Matching the data: digital ID and biometrics

Humanitarian data collection systems often contain personal or demographic identifiable information belonging to vulnerable individuals and households, collected as part of the assistance registration process. This is often done in order to create a form of digital identification (ID) defined as "functional," that individuals should use to prove their identity in order to receive specific services by one or more private or nonprofit actors.

WFP's SCOPE,[205] one of the largest data management systems in the humanitarian sector, by 2020 it hosted the personal identifiable data of more than 63 million vulnerable people (of which some 20 million actively managed through the system), and it is licensed to other NGOs defined as subgrantees or implementing partners. Another example is World Vision's LMMS, which has "registered over 10 million beneficiaries and has been deployed in over 30 countries globally, by over 20 different humanitarian agencies."[206] Only in 2022, UNHCR reported more than 3 million individual registrations by its implementing partners through the PRIMES proGres v4 system, and more than 4 million individuals biometrically enrolled in its Biometric Identity Management System (BIMS).[207]

Most digital ID systems are not a single technology, but a suite of technologies that, when taken together, facilitate the identification process. As such, there is not a universally agreed definition of digital ID, which can be a digital copy of an identity document, a set of attributes representing an individual in a transaction or a metasystem of digital identifiers that, when taken together, can uniquely identify an individual.[208]

Functional ID is different from the so-called foundational ID, also formalized as Target 16.9 in the UN's Sustainable Development Goals, stating "(b)y 2030, provide legal identity for all, including birth registration." The only case of foundational humanitarian ID is the UNHCR refugee ID, and apart from a

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[205] "WFP Scope is in 68 of the 85 countries where WFP has a presence, covering small operations to full scale rollouts with millions of beneficiaries. Almost 63.8 million identities are registered in SCOPE by the end of November 2020, with 20.2 million beneficiaries actively managed through the application." Internal Audit of SCOPE WFP's Digital Management of Beneficiaries – May 2021. (June 11, 2021). WFP. https://www.wfp.org/audit-reports/internal-audit-scope-wfps-digital-management-beneficiaries-may-2021.

[206] Last Mile Mobile Solutions ® LMMS. (Last accessed in December 2023). World Vision International webpage. https://www.wvi.org/disaster-management/last-mile-mobile-solution-lmms.

[207] UNHCR Global Report 2022. (Last accessed in December 2023). UNHCR. https://www.unhcr.org/sites/default/files/2023-06/Global-report-2022-final_0.pdf.

[208] Slavin, Aiden; Putz, Franziska; and Dr Eren Korkmaz, Emre. Digital Identity An Analysis For The Humanitarian Sector. (May 2021). IFRC report. https://www.ifrc.org/sites/default/files/2021-12/Digital-Identity%E2%80%93An-Analysis-for-the-Humanitarian-Sector-Final.pdf.

few exceptions, these credentials are more often recognized for specific rather than general purposes.[209]

The concept of functional digital ID has been increasingly present in humanitarian space, in alignment with the global push by international development actors and their private partners to link the provision of services to a registration and documentation process. Incidentally, as the social and economic value of connectivity grows, access to digital and communication systems is also increasingly conditioned to having a recognized form of ID.[210]

For example, in 2018, Egypt required all foreigners, including refugees and asylum-seekers, to show an original passport with a valid residency permit to purchase a mobile SIM card. Following joint advocacy efforts by telcos and aid actors, the regulators allowed one specific telecommunication provider to recognize UNHCR refugee credentials as a valid means of proof. Refugees were not, however, allowed to freely complete the purchase. The exception was a "corporate deal" valid only when UNHCR acted as trusted partner providing the names and phone numbers of the beneficiaries and the MNO registered the SIM cards.[211]

While the Egyptian case study showed the potential of joint humanitarian/corporate advocacy for brokering expanded access to communication systems by vulnerable communities, it also highlights many challenges. The resulting deal creates a mediated access to lifeline communications, one dependent on UNHCR focal points and the MNO controlling a list of selected UNHCR-registered individuals, and excluding from this procedure all other undocumented foreigners, as well as those individuals registered by UNHCR who might want to buy their SIM card directly or to create a new line.[212]

This problem was ultimately mitigated as the Egyptian authorities recently were announced to have allowed refugees to register SIMs in their own name.[213] The creation of inclusive and nondiscriminatory pathways for digital access is a long and thorny one, demanding deliberate and intentional efforts by aid actors and other power brokers.

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[209] The mandate of the High Commissioner for Refugees and his Office. (October 2013). UNHCR Note. https://www.unhcr.org/uk/media/mandate-high-commissioner-refugees-and-his-office. See also FATF Guidance on Digital Identity. (March 2020). Financial Action Task Force (FATF). https://www.fatf-gafi.org/content/dam/fatf-gafi/guidance/Guidance-on-Digital-Identity.pdf.

[210] Guidance on Digital Identity. (2020). Financial Action Task Force (FATF). https://www.fatf-gafi.org/content/dam/fatf-gafi/guidance/Guidance-on-Digital-Identity.pdf.

[211] Displaced & Disconnected - Mena Report. (August 2023). UNHCR report. https://www.unhcr.org/innovation/wp-content/uploads/2023/08/Displaced-and-Disconnected-MENA-Report.pdf.

[212] Id.

[213] Spotlight 2 – P2C and Connectivity for Refugees. (December 12, 2023). ITU event. https://www.itu.int/itu-d/sites/partner2connect/spotlight-2-p2c-and-refugee-connectivity/.

The imposition of digital ID has been contested by experts[214] and human rights groups[215] both on ontological and ethical grounds, as it hinders access to essential services[216] and conditions it to forms of surveillance and control[217] on populations in distress and experiencing vulnerability. The addition of the digital layer also raises questions related to the protection, privacy, and agency over the resulting data and metadata, especially when the involvement of companies as providers might involve the commodification of these assets.

A limited number of private sector organizations are leading investment in digital identification systems and their underlying technologies, such as Microsoft, Mastercard, and Okta, but most of the implementation of these technologies in the humanitarian space are still in pilot phase.

Consultancies such as McKinsey Global Institute have estimated[218] that digital identity systems could save 110 billion hours in government services provision, and unlock further earnings from the ID registration of the more than 1.7 billion people worldwide who are currently excluded from the traditional financial sector.

The value proposition is reflected in the market cap of these actors and Okta, for example, recorded an annual revenue for 2023 of USD 1.858B, a 42.92% increase from 2022.[219] Despite its negative track record in terms of cybersecurity,[220] the company is securing and funding several ID systems for

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[214] Masiero, Silvia, and Arvidsson, Viktor. Degenerative outcomes of digital identity platforms for development. (June 7, 2021). Information Systems Journal article. https://onlinelibrary.wiley.com/doi/full/10.1111/isj.12351.

[215] #WhyID. (Last accessed in December 2023). Access Now webpage. https://www.accessnow.org/campaign/whyid/.

[216] Aparo, Alice. Uganda's Digital ID System Hinders Citizens' Access to Social Services. (October 23, 2023). CIPESA blog post. https://cipesa.org/2023/10/ugandas-digital-id-system-hinders-citizens-access-to-social-services/.

[217] Masiero, Silvia. Digital identity as platform-mediated surveillance. (January 3, 2023). Big Data & Society. https://journals.sagepub.com/doi/10.1177/20539517221135176.

[218] Slavin, Aiden; Putz, Franziska; and Dr Eren Korkmaz, Emre. Digital Identity An Analysis For The Humanitarian Sector. (May 2021). IFRC report. https://www.ifrc.org/sites/default/files/2021-12/Digital-Identity%E2%80%93An-Analysis-for-the-Humanitarian-Sector-Final.pdf.

[219] Okta Revenue 2016-2023. (Last accessed in December 2023). Macrotrends webpage. https://www.macrotrends.net/stocks/charts/OKTA/okta/revenue.

[220] Toulas, Bill. Okta hit by third-party data breach exposing employee information. (November 2, 2023). Bleeping Computer article. https://www.bleepingcomputer.com/news/security/okta-hit-by-third-party-data-breach-exposing-employee-information/.

humanitarian actors[221] including Mercy Corps[222] and the Norwegian Refugee Council,[223] both on the backend and on some activities facing affected populations.[224]

The interconnectedness of identity and finance is a major driver that pushed Mastercard to enter the digital ID business for development and humanitarian applications as part of Mastercard Aid Network.[225] Mastercard SVP of Digital Identity Sarah Clark said, "My business is actually responsible for building a new network for Mastercard: the identity network."[226] From a normal consumer's standpoint, Clark added, the network is "not directly related" to Mastercard's payment network at all.

But the ID and payment network do get connected in the backend. The crossing of personal or health data, identity data, and financial information in humanitarian settings follows the model of service providers harvesting spurious data sources to build credit history and ensure access to banking and financial services.[227] Digital identity technology also introduces additional friction to emergency relief situations due to its dependency on electricity and connectivity.

On the basis that biometric-based solutions for ID verification offer increased levels of assurance, the private sector together with some international actors have been increasingly pressuring the humanitarian community to introduce these intrusive technologies. Critics have contested the validity of these claims around increased assurance.[228] However, some of our respondents pushed back, and pointed at internal data showing positive feedback from users, efficiency, and financial gains. Both arguments leave unanswered core questions such as the marginal cost required to set up, run and protect such a critical, permanent database of personal data across countries when compared to potential alternatives, the opportunity assessment of running the biometric system in parallel to non-biometric options, and the comparative analysis of the concrete added value from an individual recipient's perspective when compared to the trade offs, among others. Surprisingly, no official study

[221] OKTA for good. (Last accessed in December 2023). Website. https://www.okta.com/okta-for-good/.
[222] Coffee break with OKTA - Mercy Corps. (Last accessed in December 2023). Okta video. https://share.vidyard.com/watch/ZtDKbCfagBkLxg1fuPVXkZ?.
[223] Norwegian Refugee Council Safely Expands Its Reach With Okta. (Last accessed in December 2023). Okta video. https://www.okta.com/customers/nrc-norwegian-refugee-council/.
[224] Digital humanitarian integration at scale. (July 4, 2023) HIP website. https://hip.innovationnorway.com/article/digital-humanitarian-integration-at-scale.
[225] Transforming humanitarian response. (Last accessed in December 2023). Mastercard webpage. https://www.mastercard.com.ph/en-ph/business/governments/find-solutions/humanitarian-aid.html.
[226] Burt, Chris. Mastercard digital identity network plans detailed at Authenticate 2022. (October 20, 2022). Biometric update blog post. https://www.biometricupdate.com/202210/mastercard-digital-identity-network-plans-detailed-at-authenticate-2022#:~:text=%E2%80%9CMy%20business%20is%20actually%20responsible,of%20the%20global%20enterprise's%20ambitions..
[227] Slavin, Aiden; Putz, Franziska; and Dr Eren Korkmaz, Emre. Digital Identity An Analysis For The Humanitarian Sector. (May 2021). IFRC report. https://www.ifrc.org/sites/default/files/2021-12/Digital-Identity%E2%80%93An-Analysis-for-the-Humanitarian-Sector-Final.pdf.
[228] Tsui, Quito and Perosa, Teresa. New Report: Biometrics In The Humanitarian Sector [2023]. (July 27, 2023). The Engine Room. https://www.theengineroom.org/biometrics-humanitarian-sector-2023/.

exists assessing the value-for-money of the biometric solution as part of the humanitarian response system.

However, as Access Now has repeatedly argued, even if the claims of increased efficiency and assurance were to be founded, forcing people with little recourse, such as people affected by conflict and violence, to surrender private information in exchange for food is "an affront to human rights standards, and an insult to human dignity."[229]

This perspective gathers support across the humanitarian space, and even those actors like UNHCR, who opted for collecting biometrics, agree that consent is not an applicable legal basis for processing of personal data in humanitarian context. Instead, they often rely on public interest justified by their protection mandate for their legal basis.[230] This already limits the number of aid actors potentially allowed to explore the legal use of this technology in a significant way.

The main driver pushing biometric companies to engage the aid sector, as can be perceived in TrustStamp's filing with U.S. securities authorities,[231] seems to be a mix of aidwashing and market entry strategy. The biometric sector markets their products as socially acceptable and trustworthy because they are deployed for good causes, while at the same time carving out a space in the global market by affirming them as a necessity to stave off corruption and waste of aid resources. In a single go, biometrics companies are vicariously benefitting from the trust that humanitarians enjoy with the public, while simultaneously exploiting (and fueling) the mistrust that comes from a prejudice attributing inefficiency and unreliability to all publicly-funded social services.

Over the years, a multitude of biometric-adjacent companies have approached the aid market but very few have entered it, mostly by supporting the UNHCR BIMS (see case study 4), IOM[232] (Migration Information and Data Analysis System - MIDAS[233]), and WFP SCOPE[234] (Neurotechnology MegaMatcher

[229] Iris scanning of refugees is disproportionate and dangerous — What's happening behind IrisGuard's closed doors?. (January 26, 2023). Access Now blog post. https://www.accessnow.org/press-release/irisguard-refugees-jordan/.

[230] Biometrics (2020). In Handbook on data protection in humanitarian action - 2nd Edition. ICRC. https://www.icrc.org/en/data-protection-humanitarian-action-handbook. Information also confirmed through stakeholders consultation.

[231] T Stamp Inc - 424B4 - Prospectus. (February 06, 2023). Fintel archive entry. https://fintel.io/doc/sec-t-stamp-inc-1718939-424b4-2023-february-06-19394-3604.

[232] Biometrics. (Last accessed in December 2023). IOM webpage. https://www.iom.int/biometrics.

[233] MIDAS - A Comprehensive And Affordable Border Management Information System. (Last accessed in December 2023). IOM. https://www.iom.int/sites/g/files/tmzbdl486/files/documents/midas-brochure18-v7-en_digitall.pdf.

[234] WFP SCOPE. (September, 2019). WFP brochure. https://docs.wfp.org/api/documents/7e86e5a6a70447aba713e3cd4e759d8d/download/.

ABIS,[235] IrisGuard[236]) biometric systems. Both UNHCR and WFP internal audits or assessments have highlighted criticalities in their biometric and ID system, with experts decrying WFP SCOPE for retaining so much data while failing basic GDPR criteria for data protection 'by design and default.'[237] In Yemen, starving populations remained without assistance because WFP and the Houthi armed group were in fundamental disagreement on the use of biometrics in the country.[238] The role of IOM is harder to frame in one specific category, as on one side it collects biometrics through direct collection from affected displaced communities to run its Displacement Matrix Tracker, while also being a major provider of border and migration control support services worldwide, including the provision of IOM-made biometric-based tools for border management.[239]

Overall, apart from IrisGuard and the UN managed systems, there is little public information on who the main biometrics providers are. A few private companies such as Simprints and Yoti have briefly provided their services to aid organizations, but based on interviews and desk research, most have now shifted to supporting development or public health-related programmes in non-conflict areas. A few, including NEC, Idemia, and IrisGuard, underwent heavy scrutiny by rights organizations – and by Access Now in particular – for the adverse impacts on human rights their tools may levy when deployed by certain of their clients.[240]

A relatively niche use of biometrics has emerged over the past few years, not aimed at identification and verification of identities for assistance delivery, but rather for a spectrum of protection activities. The International Committee of the Red Cross (ICRC) has developed the Trace the Face programme[241] using an Azure-based AI tool that digitizes the Restoring Family Links (RFL) program project. Initially run with support from the Turkish Red Crescent, the platform offers a chatbot in Turkish, Arabic, Farsi, and English, in addition to image matching through facial recognition to help caseworkers match a missing person with profiles in the existing database.

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[235] Turnkey multi-biometric solution. (Last accessed in December 2023). Website. https://www.megamatcher.online/.

[236] Iris scanning of refugees is disproportionate and dangerous — What's happening behind IrisGuard's closed doors?. (January 26, 2023). Access Now blog post. https://www.accessnow.org/press-release/irisguard-refugees-jordan/.

[237] Parker, Ben. EXCLUSIVE: Audit exposes UN food agency's poor data-handling. (January 18, 2018). The New Humanitarian article. https://www.thenewhumanitarian.org/news/2018/01/18/exclusive-audit-exposes-un-food-agency-s-poor-data-handling.

[238] Burt, Chris. WFP biometric aid delivery system still not fully launched in Yemen, humanitarian operation in jeopardy. (Feb 7, 2020). Biometric Update. https://www.biometricupdate.com/202002/wfp-biometric-aid-delivery-system-still-not-fully-launched-in-yemen-humanitarian-operation-in-jeopardy.

[239] Biometrics. (Last accessed in December 2023). IOM webpage. https://www.iom.int/biometrics.

[240] Remote biometric surveillance in Latin America. (2022). Access Now report. https://www.accessnow.org/wp-content/uploads/2023/04/ENG-Analysis-Remote-biometric-surveillance-LATAM.pdf.

[241] Trace the face. (Last accessed in December 2023). ICRC webpage. https://traceface.familylinks.icrc.org/start-your-search/.

We note that Azure provides cloud services to several defense groups and companies,[242] again raising concerns about the integrity and purpose of the sensitive data collected as part of humanitarian response. These concerns are all the more relevant given the claims that the system "immensely improves search efficiency and speed,"[243] without transparency into how many cases were solved using the system, its added value against the total cost of the tool, and the risks associated with this biometric data processing and retention.

In Iraq, the UNITAD partnered with Microsoft Corporation to use artificial intelligence and biometrics in evidence management and analysis (facial detection and recognition, image and video indexing; and automatic voice recognition).[244] UNITAD has worked closely with the rapid-DNA company ANDE[245] to support Iraqi authorities in victims identification, despite criticism of the tool's performance in mixed-interpretation contexts,[246] when there might be a mixture of DNA from multiple individuals, as it is often the case in conflict situations.

The tendency towards mission creep by these systems, sold to solve a humanitarian problem and then used for completely opposite purposes, is quite stark in the case of Clearview AI. In Ukraine, Clearview AI initially[247] offered its facial recognition system to the government to identify fallen Russian soldiers, but ended up being used "to detect infiltrators at checkpoints, process citizens who lost their IDs, identify and prosecute members of pro-Russia militias and Ukrainian collaborators."[248]

Luis Fondebrider, former head of forensic services for the ICRC, defined such an approach as "a combination of politics and business with very little science."[249] Once again, this form of aidwashing risks rehabilitating or normalizing a technology that is broadly considered as possibly prone to interfere with the exercise of human rights,[250] provided by a company that has strong commercial ties

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[242] Azure for US Department of Defense. (Last accessed in December 2023). Microsoft webpage. https://azure.microsoft.com/en-us/explore/global-infrastructure/government/dod.

[243] AI for Humanitarian Action projects. (Last accessed in December 2023). Microsoft webpage. https://www.microsoft.com/en-us/ai/ai-for-humanitarian-action-projects?activetab=pivot1%3aprimaryr3.

[244] Harnessing Advanced Technology in International Criminal Investigations. (Last accessed in December 2023). UN Investigative Team to Promote Accountability for Crimes Committed by Da'esh (UNITAD) report. https://www.unitad.un.org/sites/www.unitad.un.org/files/general/2105390-harnessing_advanced_technology_in_international_criminal_investigations_web10may_0.pdf.

[245] About Ande. (Last accessed in December 2023). Ande webpage. https://www.ande.com/about-ande-rapid-dna/.

[246] Dolan, Maura. 'Rapid DNA' promises breakthroughs in solving crimes. So why does it face a backlash?. (September 25, 2019). Los Angeles Times article. https://www.latimes.com/california/story/2019-09-24/rapid-dna-forensics-crime-police.

[247] War in Ukraine. (Last accessed in December 2023). Clearview webpage. https://www.clearview.ai/ukraine.

[248] Bergengruen, Vera. Ukraine's 'Secret Weapon' Against Russia Is a Controversial U.S. Tech Company. (November 14, 2023). Time article. https://time.com/6334176/ukraine-clearview-ai-russia/.

[249] Hagerty, Alexa. In Ukraine, Identifying the Dead Comes at a Human Rights Cost. (February 22, 2023). https://www.wired.com/story/russia-ukraine-facial-recognition-technology-death-military/.

[250] Id.

with law enforcement, and that has already been declared illegal by a few countries, including some of those supporting the response to the Russian invasion.

Access Now has been documenting[251] and calling out[252] the uses and abuses of biometrics[253] in peacetime and in crisis, as an infringement on basic human rights, a discriminatory practice, and a form of surveillance. Most humanitarian actors also identify these harms, and have long adopted policies aimed at excluding[254] or severely limiting[255] biometric data usage. While some actors may agree on the challenges - including bias[256] – and need for precautions, others maintain that certain uses might be justified and that not all deployments of biometric systems carry the same level of risk. For example, the group of aid entities integrating biometrics in their standard programming converge on using iris scan and fingerprint systems, while rarely deploying facial recognition systems.

Even the private sector agrees with the main public concern around biometrics that linked databases could lead to mass surveillance, including more than 70 percent of the Biometrics Institute's membership,[257] the leading industry group in the sector. Two-thirds of industry representatives also agreed that a lack of transparency about how biometrics are used is eroding public trust, but so far this majority view does not seem to have translated in any visible improvement on the accessibility of procurement and assessment documents.

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[251] Pisanu, Gaspar, and Arroyo, Veronica. Surveillance Tech in Latin America - Made Abroad, Deployed at Home. (August 10, 2021). Access Now report.
https://www.accessnow.org/wp-content/uploads/2021/08/Surveillance-Tech-Latam-Report.pdf.
[252] Iris scanning of refugees is disproportionate and dangerous — What's happening behind IrisGuard's closed doors?. (January 26, 2023). Access Now blog post.
https://www.accessnow.org/press-release/irisguard-refugees-jordan/.
[253] Wang, Xiaowei. Bodily Harms. (October 2023). Access Now report.
https://www.accessnow.org/wp-content/uploads/2023/10/Bodily-harms-mapping-the-risks-of-emerging-biometric-tech.pdf.
[254] Eaton-Lee, James and Shaughnessy, Elizabeth. Oxfam's New Policy On Biometrics Explores Safe And Responsible Data Practice. (June, 24, 2021). Oxfam Views & Voices blog post.
https://views-voices.oxfam.org.uk/2021/06/oxfams-new-policy-on-biometrics-explores-safe-and-responsible-data-practice/.
[255] The ICRC biometrics policy. (October 16, 2019). ICRC webpage.
https://www.icrc.org/en/document/icrc-biometrics-policy.
[256] Simonite, Tom. The Best Algorithms Struggle to Recognize Black Faces Equally. (July 2022, 2019).
https://www.wired.com/story/best-algorithms-struggle-recognize-black-faces-equally/. The geographical spread of the operational coverage of humanitarian INGOs makes this issue especially challenging, despite being well known and documented (See ISO/IEC DIS 19795-10(en)
Information technology — Biometric performance testing and reporting — Part 10: Quantifying biometric system performance variation across demographic groups. (Last accessed January 2024). ISO Online Browsing Platform. https://www.iso.org/obp/ui#iso:std:iso-iec:19795:-10:dis:ed-1:v1:en).
[257] Burt, Chris. Biometrics Institute members say linked databases threaten public trust. (July 13, 2022). Biometrics Update blog post.
https://www.biometricupdate.com/202207/biometrics-institute-members-say-linked-databases-threaten-public-trust.

Case study 4: BIMS

The majority of the biometric providers involved in the humanitarian sector, notably WCC Group,[258] Warwick Warp ltd,[259] Green Bit,[260] Thales,[261] GenKey,[262] IriTech[263] – Irishield,[264] SmartSensors,[265] Cognitec,[266] Accenture,[267] IrisGuard,[268] are part – or have been part at some point since 2015 – of the UNHCR biometric tech environment called BIMS. UNHCR's deep stack of biometric solutions is problematic under several aspects, including the military market and use as surveillance system Thales,[269] Accenture[270]), the controversial secrecy of their governance (IrisGuard[271]), and their overall provision of services to law enforcement and migration control authorities. More specifically, a 2016 UN review of the UNHCR biometrics program revealed that refugees in the Democratic Republic of the Congo, Chad, Thailand and India were given inconsistent information about the system,[272] and notably about when and what type of data would be shared with governments and other

[258] Identity and Security Solutions. (Last accessed in December 2023). WCC Group webpage. https://www.wcc-group.com/id-security/.

[259] Research Excellence Framework 2021. (Last accessed in December 2023). Warwick University. https://warwick.ac.uk/fac/sci/dcs/research/ref/.

[260] Invitation To Bid: No. 2023_itb_046. (June 24, 2023). UNHCR tender. https://www.unhcr.org/in/sites/en-in/files/2023-05/2023-itb-046-cover-letter_67.pdf.

[261] Id.

[262] United Nations High Commissioner for Refugees and Accenture Deliver Global Biometric Identity Management System to Aid Displaced Persons. (May 19, 2015). Accenture Newsroom. https://newsroom.accenture.com/news/2015/united-nations-high-commissioner-for-refugees-and-accenture-deliver-global-biometric-identity-management-system-to-aid-displaced-persons.

[263] Invitation To Bid: No. 2023_itb_046. (June 24, 2023). UNHCR tender. https://www.unhcr.org/in/sites/en-in/files/2023-05/2023-itb-046-cover-letter_67.pdf.

[264] IriShield BK 2121U. (Last accessed in December 2023). Iritech factsheet. https://www.unhcr.org/sites/default/files/2023-05/2023-itb-046-annex-a2-irishield-bk2121u-lot2.pdf.

[265] United Nations High Commissioner for Refugees and Accenture Deliver Global Biometric Identity Management System to Aid Displaced Persons. (May 19, 2015). Accenture Newsroom. https://newsroom.accenture.com/news/2015/united-nations-high-commissioner-for-refugees-and-accenture-deliver-global-biometric-identity-management-system-to-aid-displaced-persons.

[266] Id.

[267] Id.

[268] Registration tools. (Last accessed in December 2023). UNCHR webpage. https://www.unhcr.org/registration-guidance/chapter3/registration-tools/.

[269] Defence and Security. (Last accessed in December 2023). Thales Group webpage. https://www.thalesgroup.com/en/markets/defence-and-security. See also Response from Thales Group to questions on the provision of surveillance tech and due diligence in the context of migration or border control in MENA. (August 1, 2022). Business & Human Rights Resources Centre. https://www.business-humanrights.org/en/latest-news/response-from-thales-group-to-questions-on-the-provision-of-surveillance-tech-and-due-diligence-in-the-context-of-migration-or-border-control-in-mena/.

[270] Aerospace and Defense. (Last accessed in December 2023). Accenture webpage. https://www.accenture.com/ch-en/industries/aerospace-defense-index.

[271] Iris scanning of refugees is disproportionate and dangerous — What's happening behind IrisGuard's closed doors?. (January 26, 2023). Access Now blog post. https://www.accessnow.org/press-release/irisguard-refugees-jordan/.

[272] Bogle, Ariel. Biometric data is increasingly popular in aid work, but critics say it puts refugees at risk. (June 21, 2019). ABC news. https://www.abc.net.au/news/science/2019-06-21/biometric-data-is-being-collected-from-refugees-asylum-seekers/11209274.

organizations. According to official reports, the recommendations from the 2016 audit were fully implemented by the time of the planned verification.[273] In Kenya, biometric registration of destitute Somali Kenyans asserting their status as Somali refugees fleeing civil war at home has inadvertently risked rendering them stateless in their own country.[274] When required to register again for the national Kenyan ID system, their previous registration as refugees at UNHCR camps led the Kenyan government to reject their applications. This event kickstarted a complex and lengthy process where UNHCR, as a protection agency also mandated to prevent statelessness, extended its services to these individuals during the time needed by the Kenyan government to correct their status.[275] In another instance, UNHCR was at the center of a global scandal when the non-digital biometric data (fingerprints on paper) that the organization collected about the Rohingya community was shared without their consent by the Bangladeshi authorities with the Myanmar authorities that had expelled the community through a genocidal campaign.[276]

Case study 5: Care Voice ID

A partnership convened by the GSMA, allowed CARE International and the telecommunication company Telesom to develop and deploy a solution using users' voice as verification for cash and voucher assistance (CVA) in Somaliland.[277] Using a user's voice signature, instead of the traditional thumbprints and signatures, and delivered using interactive voice response (IVR) technology, the system collects verification data from all households and acts as a trigger releasing the payments. The project piloted the solution with 2000 drought-affected households receiving cash assistance from CARE across 17 villages in the Sanaag and Sool regions, and reportedly was a net positive in terms of efficiency gains for both CARE and the participating households. The project was planned to be scaled across CARE's cash programmes, with an additional 13,000 households already included and more to follow by an expansion in Puntland through a local operator Golis. The project partners committed to the ethical use of biometric data, by establishing clear responsibilities, with Telesom leading on the collection, storage, protection and use of biometric data. However, the only policy mentioned by the project report is the 2021 Oxfam biometric and foundational identity

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[273] OIOS recommendation implementation tracker. (November 2023). OIOS UN. https://oios.un.org/sites/oios.un.org/files/Reports/rec_implementation_rate_iad_nov_2023.pdf.

[274] Idemia suspension in Kenya overturned, local solutions sought for cybercrime. (April 23, 2020). Safety&Security Africa. https://safetyandsecurityafrica.com/idemia-suspension-in-kenya-overturned-local-solutions-sought-for-cybercrime/.

[275] Information collected through direct consultation with stakeholders.

[276] Rahman, Zara. The UN's refugee data shame. (June 21, 2021). The New Humanitarian article. https://www.thenewhumanitarian.org/opinion/2021/6/21/rohingya-data-protection-and-UN-betrayal.

[277] Verifying recipients of cash assistance through Voice ID: Pilot project lessons and outcomes. (Last accessed in December 2023). GSMA Mobile for Humanitarian Innovation brief. https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2021/08/M4H_VoiceID_Evaluation.pdf.

policy,[278] as CARE apparently seems to have launched this biometric initiative without a dedicated public guidance or policy in place as of late 2023.[279] The process has been stated to be designed to ensure the data flow is secure and responsible, with all sensitive data stored on Telesom's secure servers, linked only to cash programming with Telesom, not available for other use cases, and deleted at the end of the programme.

The details about such a sensitive system and its safeguards remain limited, and the technology selected for the project remains unknown. This raises serious questions about the management and processing of the individuals' voice templates, even if Telesom affirmed having deleted the data at the end of the programme. There is even less clarity about what happened to the audio material and templates from voice and background sounds recorded by the system during the phone calls. Even if the templates extracted from persons' voices were protected or encrypted, any metadata or signal extracted from background noise and voice cloud still be used for target acquisition by parties to the conflict, a practice that has been known for at least seven years.[280] While the pilot remained limited in its application, the concept is still lingering in the humanitarian tech space, as shown by the recent launch of the Twilio voice biometrics ID system.[281]

d. Transforming the data: advanced analytics, AI, and cloud processing

Once data from vulnerable populations is collected, gathered, and transferred, it needs to be stored somewhere. Most data collection companies analyzed above offer hosting options to their customers, and even raw servers for customization. But behind their white label, the actual servers hosting these data are owned by the usual tech companies; for example, ODK Cloud and Magpi run on AWS, while KoboToolbox mostly relies on Azure.

Years ago, in a revolutionary attempt at democratizing safe data hosting for any aid actor globally, Kobo Toolbox together with UN OCHA, Harvard Humanitarian Initiative (HHI), and the International Rescue Committee (IRC), built a humanitarians-only free instance where anyone working with an aid

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[278] Eaton-Lee, James and Shaughnessy, Elizabeth. Oxfam's New Policy On Biometrics Explores Safe And Responsible Data Practice. (June 24, 2021). Oxfam Views & Voices blog post. https://views-voices.oxfam.org.uk/2021/06/oxfams-new-policy-on-biometrics-explores-safe-and-responsible-data-practice/.
[279] Accountability & Transparency. (Last accessed in December 2023). Care webpage. https://www.care.org/accountability-and-transparency/.
[280] Weaver, Matthew. Search for UK jihadi in Isis video to use voice and vein recognition software. (January 4, 2016). The Guardian article. https://www.theguardian.com/world/2016/jan/04/isis-video-uk-jihadi-voice-vein-recognition-software.
[281] Wieber, Angela. Voice Biometrics Using Twilio Serverless and VoiceIt. (September 27, 2022). Twilio blog post. https://www.twilio.com/blog/voice-biometrics-voiceit.

organization-branded email address can open a personal account and deploy the data collection and management system at no cost.[282]

In September 2023, this 'humanitarian instance' of Kobo that was previously managed by OCHA, transitioned to a free Community Plan managed by KoboToolbox directly, with more stringent caps on the amount of free form submissions, data, and media storage.[283] While the new plan will surely help the sustainability of the KoboToolbox project and possibly limit abuses linked to the lack of oversight and limits in the previous setup, it does not address the core issues hidden in this approach. At the time of writing, the Dublin based, EU-hosted Azure server contains an undefined amount of extremely sensitive data uploaded in each Kobo user's personal account. It is highly likely, for example, that this data includes information uploaded by persons who moved on from their accredited NGO to another profession, and lost access to the database a long time ago.

The overall data hosting environment reflects the same limited range of options. We could find only a single instance of humanitarian use of a non-U.S. company for cloud hosting, related to a one-off collaboration between Alibaba Cloud and WFP for its World Hunger Map.[284] Google Cloud remains a residual hosting option used mostly by Google Workspace humanitarian clients such as Action Against Hunger[285] or Direct Relief, [286]and AWS is an emergent but still limited presence, with a solid foothold with disaster response actors such as the American Red Cross and Humanitarian OpenStreetmap Teams.[287] The use of alternative providers like Hetzner Online by Mapswipe, an open-source mobile app for crowdsourced collaborative humanitarian mapping,[288] is currently a very rare occurrence.

Our research has found that the majority of international humanitarian organizations have over time consolidated onto Microsoft Azure (used by ICRC, most UN agencies, and several major international NGOs such as Mercy Corps, NRC, among others), which is now in a situation of semi-monopoly and hosting the world's most sensitive datasets, despite its blemished track record on security.[289]

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[282] KoBoToolbox. (Last accessed in December 2023). UN OCHA.
https://humanitarian.atlassian.net/wiki/spaces/imtoolbox/pages/3190980609/KoBoToolbox.
[283] FAQ for Humanitarian Organizations about the server transfer to Kobo. (Last accessed in December 2023). KoboToolbox webpage. https://www.kobotoolbox.org/ocha-server-transfer-faq/.
[284] Alibaba Cloud Summit - Digital Beats - The World Hunger Map. (June 8, 2021). Alibaba Cloud video. https://www.alibabacloud.com/campaign/summit-live-2021/digital-beats-theworldhungermap.
[285] Success stories. (Last accessed in December 2023). Google for Nonprofits webpage. https://www.google.com/nonprofits/success-stories/.
[286] Direct Relief. (Last accessed in December 2023). Google for Nonprofits webpage. https://www.google.com/nonprofits/success-stories/direct-relief/.
[287] AWS Disaster Response. (Last accessed in December 2023). AWS webpage. https://aws.amazon.com/government-education/nonprofits/disaster-response/?nc1=h_ls.
[288] Virtual Card charge: HETZNER.COM (Last accessed in January 2024). Open Collective webpage. https://opencollective.com/mapswipe/expenses/126045
[289] Roth, Emma. Microsoft called out for 'blatantly negligent' cybersecurity practices. (August 4, 2023). The Verge article. https://www.theverge.com/2023/8/3/23819237/microsoft-azure-breach-blatantly-negligent-cybersecurity-practices.

This trend is mostly guided by IT-driven considerations, as a single digital environment offers easier access control management and efficient cybersecurity setup, and by the lack of real competitors to the Microsoft Office package, which nudges companies to negotiate for the full bundle of Microsoft services instead of dealing with multiple and often less-integrated providers.

But this comes at a cost. In addition to the risk of vendor lock-in already felt by many interviewees, there's also the shared concern about the lack of options based on quality, performance, safety or ethics. This reduces the capacity for bargaining for more favorable terms or more protective conditions, making it almost impossible to push back against contract clauses such as the reservation by the vendor or its partners to access the data to 'improve the service' or 'improve performances'. This kind of language might represent a loophole, leaving very broad discretion to any manual or automated process from these sprawling tech companies to analyze or process very sensitive data in order to release new features or train commercial algorithms.

These concerns are evident to many experts in the field that we consulted, and are among the driving factors behind the first early attempts at experimenting with free and open-source solutions for cloud hosting. In 2023, UNICC partnered with Canonical,[290] the publisher of Ubuntu and provider of open-source security, support and services, to build and deliver the first secure private cloud environment for the UN system, an approach with mixed prospects (see case study 7).

Having access to powerful cloud systems allow humanitarian organizations to process and analyze the data collected from local communities or through remote tools quicker and faster. So far, most of the attempts at leveraging a big data-level of automation have focused on simple chatbots,[291] like those built using the Whatsapp Business API service by Praekelt (now called Reach Digital Health)[292] with

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[290] UNICC Partners with Canonical to Build UNICC Cloud. (October 19, 2023). UNICC press release. https://www.unicc.org/news/2023/10/19/unicc-partners-with-canonical-to-build-unicc-cloud/.
[291] Chatbots in humanitarian contexts. (2023). IFRC report. See also Chatbots in humanitarian settings: revolutionary, a fad or something in-between? (Last accessed in December 2023). UNHCR Innovation Service blog post. https://www.unhcr.org/innovation/chatbots-in-humanitarian-settings-revolutionary-a-fad-or-something-inbetween/. https://communityengagementhub.org/wp-content/uploads/sites/2/2023/06/20230623_CEA_Chatbots.pdf.
[292] The former URL (https://www.praekelt.org/) redirects to https://www.reachdigitalhealth.org. The website of the Turn.io platform built by Praekelt fails to mention any of the governance changes in their legal pages. As of the end of January 2024, Praekelt is still named as the parent company for the software platform.

UNHCR,[293] by NRC with Twilio and Zing,[294] by InSTEDD, Telegram and WFP,[295] by RapidPro and UNICEF,[296] and by SAP/ Qualtrics and Lithuanian Red Cross.[297] It is worth noting that – despite chatbots being the main use case claimed by those promoting AI solutions – hardly any of these uses machine learning.

ClearGlobal's Uji multilingual chatbot [298]is one of the few to actually use NLP[299] to answer specific, targeted questions around COVID-19 and runs on Telegram and Whatsapp. The role of AI is however limited to directing users to the appropriate information and answers they need based on recognised keywords, while staff members keep oversight of the information and are available to address issues and questions from users. It was deployed in partnership with IFRC and the Congolese Red Cross Society and could engage users in French, Congolese Swahili, and Lingala.

Another WhatsApp chat system, the SOLIS bot by Solidarités international running on Twilio, also deployed machine learning only to support user engagement through a voice-to-text-to-voice module (to overcome literacy barriers) and a natural language understanding function to adapt dialect and terminology[300] to the one preferred by the refugee communities in Lebanon to communicate with humanitarian organizations.[301]

[293] John Warnes. Meeting communities where they are — the increasing preference of messaging apps. (November 3, 2020). UNHCR Innovation Service blog post. https://medium.com/unhcr-innovation-service/meeting-communities-where-they-are-the-increasing-preference-of-messaging-apps-3338ee9ee957.
[294] Developer Q&A: Helping the Norwegian Refugee Council (NRC) deploy information gathering chatbots in Ukraine. (March 23, 2022). Zing blog post. https://zing.dev/news-and-views/helping-the-norwegian-refugee-council-nrc-deploy-information-gathering-chatbots-in-ukraine.
[295] "Foodbot": Developing a WFP Chatbot to Communicate with Target Populations. (Last accessed in December 2023). InSTEDD blog post. https://instedd.org/project/foodbot/.
[296] Humanitarian Futures for Messaging Apps. (June 12, 2020). ICRC, The Engine Room. https://www.icrc.org/en/publication/humanitarian-futures-messaging-apps.
[297] Anderson, Brad. Supporting Ukraine Relief Efforts. (March 8, 2022). Qualtrics blog post. https://www.qualtrics.com/blog/supporting-ukraine-relief-efforts/.
[298] Chatbots against COVID. (Last accessed in December 2023). Translators without borders info sheet. https://translatorswithoutborders.org/wp-content/uploads/2020/07/Com_CR_2pager_Chatbot_Final.pdf.
[299] Chatbots in humanitarian contexts. (2023). IFRC report. https://communityengagementhub.org/wp-content/uploads/sites/2/2023/06/20230623_CEA_Chatbots.pdf.
[300] SOLIS Bot: Project lessons and outcomes. (2023). GSMA. https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2023/05/IF_CaseStudy_SOLIS_R_WEB.pdf.
[301] Acland, Susanna and Willitts-King, Barnaby. Mobile phones for participation: building responsible public-private humanitarian partnerships. (December 7, 2023). Humanitarian Law and Policy. https://blogs.icrc.org/law-and-policy/2023/12/07/mobile-phones-for-participation-building-responsible-public-private-humanitarian-partnerships/.

In Ukraine, in late 2022 the ETC deployed vBezpetsi,[302] a chatbot developed by WFP and previously tested in Libya, Iraq and Ecuador, only to decommission it one year later.[303] A study of the challenges (not specified in official statements) met by the chatbot has been announced, but specific details were not available at the time of this report. The ETC already ran an AI-enabled chatbot (Tawasul) in Libya in 2020, although its most advanced features were disabled.[304]

Humanitarian organizations have so far been wary of releasing advanced AI functionalities as these chatbots would collect and store more user-related data, and generate data protection and other risks.[305]

Usually less controversial, at least in terms of sensitive personal and demographic data fed to the algorithm, natural language processing (NLP) models for automated text classification and analysis are possibly the most commonly used solutions in this section. Data Friendly Space (DFS)[306] built the automated component for a free, open-source tool developed in the wake of the devastating 2015 Nepal earthquakes to centralize, accelerate, and strengthen inter-agency response to humanitarian crises, called the Data Entry and Exploration Platform (DEEP). The DEEP[307] has also become a go-to resource for many organizations, including UNHCR, UNICEF, UN OCHA, and the IFRC. More recently, DFS also helped to replace IDMC's manual data processing with IDETECT, a NLP data collection tool that analyzes thousands of global news sources daily. [308]

Advanced analytics and AI systems have also seen a thriving cooperation among private and public aid actors[309] within the broader information management context, especially in the disaster response and complex crisis field. For example, the WFP, in collaboration with Google AI, automated satellite imagery analysis through SKAI,[310] an AI system designed to automate post-disaster damage assessment. WFP used SKAI after the August 2020 Beirut explosion, in the Ethiopia Tigray Conflict, and after Fiji Cyclone Ana, and it is now being integrated into WFP's standard GIS toolkits.

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[302] Matak, Vincent. Humanitarian chatbot: How tech bridges gap between people and the assistance they need in Ukraine. (August 26, 2022). WFP blog post. https://www.wfp.org/stories/humanitarian-chatbot-how-tech-bridges-gap-between-people-and-assistance-they-need-ukraine.
[303] ETC Ukraine Sitrep - June 2023. (July 4, 2023). ETC. https://www.etcluster.org/document/etc-ukraine-sitrep-june-2023.
[304] Chatbots in humanitarian contexts. (2023). IFRC report. https://communityengagementhub.org/wp-content/uploads/sites/2/2023/06/20230623_CEA_Chatbots.pdf.
[305] Id.
[306] How we support the humanitarian community. (Last accessed December 2023). Data Friendly Space. https://datafriendlyspace.org/services/?case=3311.
[307] DEEP – a collaborative analysis platform for effective aid responses. (Last accessed December 2023). DEEP. https://thedeep.io.
[308] How we support the humanitarian community. (Last accessed December 2023). Data Friendly Space. https://datafriendlyspace.org/services/?case=3311.
[309] For a full list of AI initiatives at UN level until 2019 see: https://www.itu.int/dms_pub/itu-s/opb/gen/S-GEN-UNACT-2019-1-PDF-E.pdf.
[310] SKAI. (Last accessed December 2023). WFP webpage. https://innovation.wfp.org/project/SKAI.

The UN Center for Humanitarian Data (HCD) in the Hague collected 58 current predictive models in a publicly available dedicated archive.[311] The list includes mostly humanitarian and academic models, while the ones including private tech remain a minority. Among these, there is the IBM-DRC Global displacement forecast model (see use case 8), the Google flood forecasting model,[312] and the already mentioned Alibaba-WFP World Hunger Map.[313]

The field of population estimate systems is also a fertile ground for advanced analytics systems and collaboration between sectors, starting from the DRC/IBM forecast model and the IOM Matrix Tracker (see case study 8). Other examples include models by Remesh (a realtime large-scale synchronous dialogue process to understand stakeholder populations on an hour timescale),[314] the Flowkit by Flowminder (rapid generation of aggregated data at group level from anonymized call detail records),[315] and the Meta for Good population-related maps and products.[316]

The use of mobile[317] or app-generated data is extremely costly to clean and manage, in addition to being very sensitive and usually heavily regulated. Those actors responsible for collecting it and storing it are very wary of sharing it externally, often limiting access to trusted third parties under data-sharing agreements and only for non-active conflict areas (e.g. Meta for Good)[318] or setting up strict remote access requirements (some MNOs).[319] Hence, the use of mobile operator data in humanitarian response remains limited, despite being a reality since at least 2010, when Flowminder and Digicel partnered to analyze population movements after the tragic earthquake and cholera outbreak in Haiti.

[311] Catalogue of predictive models in the humanitarian sector. (Last accessed December 2023). Centre for Humdata webpage.
https://centre.humdata.org/catalogue-for-predictive-models-in-the-humanitarian-sector/.
[312] Flood Hub. (Last accessed December 2023). Google site. https://sites.research.google/floods/l/0/0/3.
[313] Alibaba Cloud Summit - Digital Beats - The World Hunger Map. (June 8, 2021). Alibaba Cloud video.
https://www.alibabacloud.com/campaign/summit-live-2021/digital-beats-theworldhungermap.
[314] Remesh. (Last accessed December 2023). Website. https://www.remesh.ai/.
[315] FlowKit, our open-source software for the secure processing & analysis of mobile operator data. (Last accessed December 2023). Flowminder webpage.
https://www.flowminder.org/what-we-do/mobile-data-partnerships/flowkit.
[316] Real time data can improve how we respond to real world crises. (Last accessed December 2023). Data for Good webpage. https://dataforgood.facebook.com/dfg/about.
[317] Nichols, Elizabeth. International Use of Cell Phone Location Data in Official Statistics and Social, Demographic and Health Studies. (March 10, 2023). Research report.
https://www2.census.gov/about/partners/cac/sac/meetings/2023-03/presentation-international-use-of-cell-phone-location-data-use.pdf.
[318] Tools and Data. (Last accessed December 2023). Data for Good webpage.
https://dataforgood.facebook.com/dfg/tools.
[319] Li,Tracey. UN Mobile Data Training Workshop: Obtaining access to mobile operator data. (Last accessed December 2023). Flowinder training material.
https://unstats.un.org/unsd/bigdata/conferences/2019/workshops/mobile-phone/day1/04%20MPD%20-%20Data%20Access%20-%20Flowminder.pdf.

Most work at the intersection of data and population is tightly linked with humanitarian efforts by GIS-oriented entities, such as Ushahidi,[320] a crowdsourcing website created to map incidents of violence during the 2007 Kenyan crisis and still active today. For example Mapillary – a Swedish company to scale and automate mapping through street-level images, recently bought by Meta – teamed up with Humanitarian OpenStreetMap Team (HOTOSM)[321] to improve the efficiency of the crowdsourced humanitarian mapping response support. In April 2023, Meta released Rapid 2.0,[322] an updated version of the Rapid editor for OpenStreetMap, including machine learning-generated roads and buildings from Meta and Microsoft data.[323] IBM also supported the HOTOSM work[324] in a broader coalition also including several Red Cross national societies called Missing Maps,[325] by deploying computer vision systems to facilitate mapping areas that were neglected by commercial mapping vendors. The work of HOTOSM local groups and their open data approach has been key in providing alternative models to the inequality-ridden previous approaches dominating the cartography field.[326]

Advanced analytics and machine learning processes are also used by protection actors, for example for early warning and documentation of human rights and humanitarian law abuses and violations. More commonly known for its engagement in educational technology (EdTech), Microsoft has also a preeminent role among tech companies when it comes to building human rights protection systems.

The already mentioned Microsoft/UNITAD partnership produced Zeteo, an advanced evidence-analysis solution using Microsoft's Azure Cognitive Services[327] machine learning, facial recognition and identification, machine translation and image analysis, all integrated with Relativity's evidence review and analysis platform.[328] Zeteo also benefited from other partners, including the UNICC, and the United Nations Office of Information and Communications Technology (OICT).

In 2017, Microsoft also partnered with OHCHR to build Rights View, an information 'dashboard' that is supposed to allow UN human rights staff to aggregate large quantities of internal and external data on

[320] Ushahidi. (Last accessed December 2023). Website. https://www.ushahidi.com/.
[321] Sandhu, Navjyot, and Neerhut, Edoardo. Recapping State of the Map US 2023. (June 23 , 2023). Mapillary blog post. https://blog.mapillary.com/update/2023/06/23/Mapillary-At-SOTM-2023.html.
[322] Revolutionize Your Map Editing with Rapid. (Last accessed December 2023). Website. https://rapideditor.org/.
[323] Microsoft has released new and updated building footprints. (January 14, 2022). Microsoft Maps Blog post.
https://www.microsoft.com/en-us/maps/news/microsoft-has-released-new-and-updated-building-footprints.
[324] Black, Doug. Mapping Disasters with Artificial Intelligence. (December 29, 2019). Inside HPC blog post. https://insidehpc.com/2019/12/podcast-mapping-disasters-with-artificial-intelligence/.
[325] Putting the World's Vulnerable Communities on the Map. (Last accessed December 2023). Website. https://www.missingmaps.org/.
[326] Graham, Mark, and Dittus, Martin. Geographies of Digital Exclusion - Data and Inequality. (2022). Pluto Press. https://www.oii.ox.ac.uk/wp-content/uploads/2022/01/9781786807410-2.pdf.
[327] Microsoft Cognitive Services. (Last accessed December 2023). Website. https://news.microsoft.com/cognitive/.
[328] Simply powerful discovery. (Last accessed December 2023). Website. https://www.relativity.com/.

specific countries and types of rights violations in real time.[329] Its objective is to facilitate analysis, ensure early warning of emerging critical issues and provide data to guide responses, but the real impact is unknown. The system seems to be still in use as of mid 2023.[330]

Other companies are now joining in, as shown by the USD 1 million in grant funding and additional support invested in September 2023 by Google.org in HURIDOCS, a system allowing human rights defenders to manage vast sums of data, much of it locked in PDFs and other non-searchable formats.[331] This grant will allow Ukraine to integrate machine learning models and expand Uwazi, a free and open source database application designed for human rights defenders to capture and organize collections of information.

Some unlikely actors have found a way into the humanitarian sphere, through the lens of AI for good. In June 2021, the ICRC found an unusual partner in Japanese megacorp NEC – a company better known (and questioned)[332] for its biometric systems, including facial recognition surveillance systems. The two organizations struck a Memorandum of Understanding (MOU) aimed at building an open and affordable AI system to help in predicting minefield locations using image recognition.[333] NEC has also contributed leveraging on its own ethical AI and human rights principles, to support ICRC since 2019 in the development of its second Data Protection Handbook for Humanitarian Action.[334]

Case study 6: Child Growth Monitor App
In 2018, Microsoft[335] supported Welthungerhilfe[336] with the development of the Child Growth

[329] Ith, Tracy. Technology helps the UN advance the protection of human rights in new ways. (May 16, 2017). Microsoft press release. https://news.microsoft.com/features/technology-helps-un-advance-protection-human-rights-new-ways/.

[330] Associate Human Rights Officer Vacancy. (Last accessed December 2023). UN Talent vacancy. https://untalent.org/jobs/associate-human-rights-officer-65.

[331] HURIDOCS receives Google support to advance the United Nations Sustainable Development Global Goals. (September 12, 2023). https://huridocs.org/2023/09/huridocs-receives-google-grant/.

[332] USA: Report warns of significant human rights risks from HART biometric database & CSOs call on AWS to terminate agreement to host the database. (August 2, 2022). Business & Human Rights Resources Centre. https://www.business-humanrights.org/en/latest-news/usa-report-warns-of-significant-human-rights-risks-from-hart-biometric-database-csos-call-on-aws-to-terminate-agreement-to-host-the-database/.

[333] AI, Data Analysis Supports Demining Activities. (Last accessed December 2023). NEC press release. https://www.nec.com/en/global/sdgs/innovators/project/article13.html.

[334] NEC & ICRC: A blueprint for ethical technology partnerships between the private and humanitarian sectors. (Last accessed December 2023). NEC press release. https://www.nec.com/en/global/sdgs/innovators/project/article02.html.

[335] Microsoft. (Last accessed December 2023). Welthungerhilfe webpage. https://www.welthungerhilfe.org/about-us/partners/corporate-partners/microsoft.

[336] Resources - Child Growth Monitor.(Last accessed December 2023). Welthungerhilfe webpage. https://cgmcoredevwecms.azurewebsites.net/resources/.

Monitor mobile app,[337] which aims to contribute to the global fight against hunger by facilitating faster aid for malnourished children using a body scan. The project was also supported by Deutsche Telekom AG,[338], Microsoft Germany, PHAT Consulting GmbH,[339] Sony Depthsensing Solutions, and Boston Consulting Group.[340] The app used machine learning to accurately estimate the height of standing children under five from depth images collected using a commercial off-the-shelf smartphone. Overall, the creators collected data of 3887 children (2581 train data, 1306 test data) aged two-five years in rural India. Their approach claimed to estimate height with a mean absolute error of 1.64%, and for 70.3% test images, it achieved the acceptable 1.4 cm range. The open source app was developed on the company's platform and allowed for very lax data sharing options, under a blanket consent form signed by the parents of the children, and the Welthungerhilfe Data Privacy & Commitment to Maintain Data Secrecy Agreement. The data collected is compatible with the definition of biometrics, as it might allow for identification of the children in the pictures. In a deeply misguided and extractive interpretation of the concept of open data, the researching team even offered anyone interested access to the data,[341] to understand and visualize the insights, and even to train other machine learning models. This whole project is a clear example of how humanitarian experimentation on vulnerable populations might inadvertently have been exploited to feed the machine learning data-training environment. Despite not being active anymore, and its ethical issues, this project is still showcased as an example of AI use in the ITU AI for Good website.[342] This kind of behavior is extremely worrying due to the sensitivity of the topic, the lack of adequate policy or guidelines, and the opacity about the fate of all the data that was collected.

Case Study 7: UNICC Cloud

The partnership between UNICC and Canonical would bring to UN agencies the benefit of direct and independent control over data through server nodes operated exclusively at UNICC data centers.[343] The first node being activated is UNICC's data center in Valencia, Spain, with support from the Spanish government, and other nodes will follow based on the interest of UN Member States to fund and host them. The announced goal is to provide cutting-edge security and data sovereignty for the UN's most sensitive data and software applications, but most importantly the initiative wants to

[337] Child Growth Monitor on Github. (Last accessed December 2023). Github repository. https://github.com/Welthungerhilfe/ChildGrowthMonitor.

[338] Digital Solutions to the Fight Against Hunger: Deutsche Telekom supports Welthungerhilfe projects. (Last accessed December 2023). Welthungerhilfe webpage. https://www.welthungerhilfe.org/about-us/partners/corporate-partners/deutsche-telekom-ag.

[339] Digital Technology: PHAT Consulting GmbH supports Welthungerhilfe. (Last accessed December 2023). Welthungerhilfe webpage. https://www.welthungerhilfe.org/about-us/partners/corporate-partners/phat-consulting-gmbh.

[340] Diverse Engagement: Boston Consulting Group supports Welthungerhilfe. (Last accessed December 2023). Welthungerhilfe webpage. https://www.welthungerhilfe.org/about-us/partners/corporate-partners/boston-consulting-group.

[341] Child Growth Monitor on Github. (Last accessed December 2023). Github repository. https://github.com/Welthungerhilfe/ChildGrowthMonitor.

[342] World Food Programme (WFP) Description of Activities on AI. (Last accessed December 2023). AI for Good. https://aiforgood.itu.int/about-ai-for-good/un-ai-actions/wfp/.

[343] UNICC Partners with Canonical to Build UNICC Cloud. (October 19, 2023). UNICC press release. https://www.unicc.org/news/2023/10/19/unicc-partners-with-canonical-to-build-unicc-cloud/.

Case Study 7: UNICC Cloud
reduce the dependency on commercial cloud providers for storing and processing sensitive and confidential data. We see, however, unresolved issues in the UN concept of "data sovereignty." UNICC Cloud would allow the UN to enjoy the data processing offered by advanced cloud computing, with the legal protections offered by UN Privileges and Immunities.[344] While protecting the data from potentially harmful interference by governments, this would remove even the modicum of transparency and accountability that civil society can currently exert on the UN data system, by requiring their commercial hosting partners to comply with data protection and privacy regulations. By migrating to UNICC Cloud, some UN agencies could therefore become end-to-end immune to any external regulations and accountability mechanisms. This calls for an intentional and deliberate intervention by UNICC and the whole UN system to act as a responsible data entity, and make sure that their accountability framework is adequate to the responsibility that comes with their newly acquired digital sovereignty.

Case study 8: Palantir
In the field of advanced analytics, the partnership between WFP and Palantir[345] to improve Optimus,[346] WFP's supply chain optimization tool used in at least 44 country operations raised questions but obtained few answers. Criticism focused on the close relationship between Palantir and the defense industry,[347] while WFP scrambled to clarify that the agreement did not include any access to sensitive data by individuals. The secrecy of the contracts and related terms of service, due to non-disclosure agreements, made it even more complicated for WFP to address the criticism levied at them. But the contract with WFP was not the first foray by Palantir in the humanitarian field. Through publicly available information and employees' job descriptions, we could confirm that during the Syrian civil war Palantir supported Mercy Corps[348] to create an early-warning system using pattern recognition to predict violent escalations, and to design a route planning dashboard

[344] Convention On The Privileges And Immunities Of The United Nations. (February 13, 1946). UN treaty. https://www.un.org/en/ethics/assets/pdfs/Convention%20of%20Privileges-Immunities%20of%20the%20UN.pdf.

[345] Palantir and WFP partner to help transform global humanitarian delivery. (February 5, 2019). WFP press release. https://www.wfp.org/news/palantir-and-wfp-partner-help-transform-global-humanitarian-delivery.

[346] Optimus. (Last accessed December 2023). WFP Innovation Accelerator webpage. https://innovation.wfp.org/project/optimus.

[347] Parker, Ben. New UN deal with data mining firm Palantir raises protection concerns. (February 5, 2019). The New Humanitarian article. https://www.thenewhumanitarian.org/news/2019/02/05/un-palantir-deal-data-mining-protection-concerns-wfp.

[348] Lev-Ram, Michal. Palantir Turns Its Software Toward Syria. (March 9, 2016). Yahoo News article. https://finance.yahoo.com/news/palantir-turns-software-toward-syria-113043000.html?guccounter=1.

for logistics coordinators.[349] By its own definition, Palantir builds AI technologies for surveillance and military purposes. It has been described as the "pro-military arm of Silicon Valley,"[350] and according to their CEO their software allegedly informs most of the decisions about which Russian positions to attack in Ukraine.[351] For such a big data company, synthesizing seemingly-innocuous logistical data points and anonymous metadata from the world's worst combat zones with defense sector information to create actionable, lucrative intelligence would not be a heavy lift.

Case study 9: Hala Systems

Hala Systems[352] is among the few examples of humanitarian tech developed in a crisis area by a group of tech savvy, non-aid workers professionals.[353] Founded in 2015, Hala Systems has not only outlasted many projects launched by traditional aid actors, but has actually grown substantially since. The for-profit social enterprise created a civilian protection system called Sentry, which generates warnings in advance of impending airstrikes in Syria. Realizing the value of the data and metadata gathered by the platform, Hala Systems has built and deployed internet-of-things sensors and a machine learning-based system that automatically ingests data from Facebook, Telegram and Twitter to improve the process and increase scalability, and to produce accountability-oriented materials and reports. In addition to Syria, it also deployed in Yemen and Ukraine, among others. The company proposes a protection-oriented concept, and strong evidence of its legitimate engagement for communities. However, the information produced by Hala Systems' real time data collection in non-permissive regions might also present risks for affected communities. This kind of data is extremely valuable to a large variety of non-humanitarian actors, as it appears from the inflow of investments from defense programmes.[354] So far, it is almost impossible to find out using publicly available information exactly what all the real life applications are, what are the terms of contract for the field data services, where would they be stored, nor the sharing partners and conditions.

[349] Humanitarian Response to the Crisis in Syria. (February 8, 2017). Council on Foreign Relations Religion and Foreign Policy Conference Call Series.
https://www.cfr.org/conference-calls/humanitarian-response-crisis-syria.

[350] Burt, Peter. The arms race towards autonomous weapons – industry acknowledge concerns. (May 9, 2023). Drone Wars article.
https://dronewars.net/2023/05/09/the-arms-race-towards-autonomous-weapons-industry-acknowledge-concerns//

[351] Dastin, Jeffrey. Ukraine is using Palantir's software for 'targeting,' CEO says. (February 2, 2023). Reuters article.
https://www.reuters.com/technology/ukraine-is-using-palantirs-software-targeting-ceo-says-2023-02-02/.

[352] Hala Systems. (Last accessed December 2023). Website. https://www.halasystems.com/.

[353] Gold, Danny. Saving Lives With Tech Amid Syria's Endless Civil War. (August 16, 2018). Wired.
https://www.wired.com/story/syria-civil-war-hala-sentry/.

[354] Brooks, Cameron. AWS selects 13 startups to participate in the AWS European Defence Accelerator. (July 12, 2023). AWS Public Sector Blog Post.
https://aws.amazon.com/blogs/publicsector/announcing-13-startups-to-participate-aws-european-defence-accelerator/.

5. Conclusions

a. Hybridization

The much anticipated cross-pollination of ideas that was supposed to accompany the development of tighter relationships between the tech and the aid sector in 'digital transformation' has resulted in a deeper form of exchange. Our mapping uncovers a crossbreeding of roles, with companies taking over humanitarian functions, and humanitarian entities engaging in the direct provision of data and tech services.

While this is immediately evident by looking at younger, digitally-native aid organizations, it is striking to see some of the older and more traditional humanitarian institutions undergo such a transformation. For example, WFP currently provides technology-related services to the humanitarian sector[355] in two core areas: the creation and support of connectivity and telecommunication infrastructure through the Emergency Telecommunications Cluster in humanitarian emergencies, and the use of different platforms and solutions to enable cash-based transfer across operations.

During the pandemic, WFP's Supply Chain Division developed a service marketplace for about 70 partners, and in South Sudan a UN agency developed a cost-recovery model for services provision partnerships for SCOPE, their own registration and biometric system. The transfer of technologies to partners by WFP is very broad, and includes the direct transfer of hardware, access provision to a variety of technologies, and even common ICT services to the humanitarian community in emergency settings. It is accurate and appropriate to define WFP, and a few other agencies, as humanitarian tech actors.

Despite this, almost none of the humanitarian actors we mapped has disclosed any details about their procurement, screening, human rights due diligence, and accompanying data protection assessment and remediation policies as would be required of a company under agreed norms on business and human rights.[356]

On the private sector side, we see tech companies progressively moving from core operational and backend functions to essential humanitarian activities such as registration, assessment, monitoring and evaluation. Aid delivery by these firms occurs either through remote digital channels or with the support of automated decision systems at key milestones in the humanitarian lifecycle.

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[355] Strategic Evaluation of WFP's Use of Technology in Constrained Environments. (January 2022). WFP Report. https://docs.wfp.org/api/documents/WFP-0000136278/download/.

[356] Guiding Principles on Business and Human Rights: Implementing the United Nations "Protect, Respect and Remedy" Framework (January 1, 2012). UN OHCHR webpage. https://www.ohchr.org/en/publications/reference-publications/guiding-principles-business-and-human-rights.

When asked about data protection impact assessments (DPIAs), most companies responded to Access Now that it is not their role, placing the responsibility on their NGO partners. In the corporate perspective, this seems to exempt them from the obligation of verifying that their tools are used within applicable data protection policy frameworks, even when deployed in conflict areas, or in compliance with mandatory and context-appropriate data protection standards. This approach is incompatible with the humanitarian principle of "Do No Harm," and industry's responsibility to conduct human rights due diligence.

In our research, the main UN agencies and some international NGOs asserted their compliance with data protection requirements, including the mandatory DPIAs on major systems. But small and medium-sized NGOs shared that the obligation to run endless data protection processes on proprietary systems owned by big tech companies puts on them an unrealistic and unsustainable burden. Google Cloud offers at least some templated guidance on how to conduct a DPIA[357] on their product, but this is insufficient for high stakes, high risk deployments.

Increasingly, humanitarian organizations such as NRC advertise on messaging apps[358] to reach those displaced by conflicts, offering registration through a two-step automated process (Twilio Flex and Twilio Conversations API), messaging an NRC number, and engaging in a chatbot experience. In this way, humanitarian responsibilities are pushed on the tech platforms, while the INGO limits its roles to content creation and a final vetting, based on the preliminary triage done through the partially automated process. The most vulnerable, those forcibly displaced, are led through a gauntlet of digital services, with their data passing through many hands, nonprofit and for-profit alike.

But on which legal and normative grounds are companies taking on these responsibilities? Our mapping found no instance of public adherence of a tech company to humanitarian principles,[359] explanation of their protection-based approach in digital development, nor public disclosure of the impact of their humanitarian intervention beyond a PR release.

In these examples, we see a pattern: Aid actors and companies are expanding their competence to non-traditional sectors, without taking on the responsibilities that accompany their expanded powers.

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[357] Cloud DPIA Resource Center. (Last accessed December 2023). Google Cloud webpage. https://cloud.google.com/privacy/data-protection-impact-assessment.
[358] Transforming the delivery of humanitarian aid. (Last accessed December 2023). Twilio webpage. https://www.twilio.org/solutions/customer/nrc.
[359] WFP Head Urges Business Leaders to Develop Smart Innovations in Fight against Hunger, Poverty, at Security Council Debate on Public-Private Partnerships. (September 14, 2023). UN Meeting Coverage note. https://press.un.org/en/2023/sc15410.doc.htm.

b. Concentration

Despite the broad range of interviews and resources explored and the countless examples of tech partnerships from the humanitarian field, our research shows mostly the same names appearing throughout the sectors mapped, with a few notable exceptions.

In fact, despite the constant growth of the humanitarian market, on the supply side over the past six years, consolidation reigns. At least 18 INGOs disappeared from global public registries,[360] and a group of around 53 INGOs (out of which 8 are considered the most important ones),[361] are left to enjoy *de facto* control.

Today, the humanitarian sector is a loosely defined space where a limited number of entities – mostly rooted in the European continent or in North America[362] – have consolidated their control over most of the public attention, the data flows, and much of the available funding.[363] To illustrate, in 2021, 57% of international humanitarian assistance came from just five public donors (U.S., EU institutions, Germany, UK, Japan). Around one-fifth continues to come from private sources, mostly individual giving. Almost half of the assistance goes to three UN agencies (WFP, UNHCR and UNICEF).[364]

The increased engagement with the tech sector has failed to realize the "Big Data Revolution" that was promised around a decade ago[365] in a wave of techno-optimism that announced a next hybrid generation of NGOs and tech startups innovating the whole field.[366]

In a way, the opposite happened. In the humanitarian tech field, a handful of big tech companies compete for the relatively meager tech funding available within a small subgroup of 'big NGOs' mentioned above. Meanwhile, actual capacity to successfully adopt and adapt tech within international and local NGOs remains limited, as these are still generally low-tech environments.

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[360] Global Database of Humanitarian Organisations. (Last accessed December 2023). Humanitarian Outcomes webpage. https://www.humanitarianoutcomes.org/projects/gdho.

[361] The big list of humanitarian NGOs. (Last accessed December 2023). Humanitarian Insider. https://humanitarianinsider.com/industry/big-list-of-humanitarian-ngos/.

[362] Global Database of Humanitarian Organisations. (Last accessed December 2023). Humanitarian Outcomes webpage. https://www.humanitarianoutcomes.org/projects/gdho.

[363] Obrecht, Alice; Swithern, Sophia; and Doherty, Jennifer. 2022 SOHS report. (2022). ALNAP webpage. https://sohs.alnap.org/sohs-2022-report/a-reader%E2%80%99s-guide-to-this-report.

[364] Id.

[365] Kirkpatrick, Robert, and Vacarelu, Felicia. Une décennie d'exploitation des mégadonnées aux fins du développement durable. (Last accessed December 2023). UN blog post. https://www.un.org/fr/chronique/article/une-decennie-dexploitation-des-megadonnees-aux-fins-du-developpement-durable.

[366] Luengo Oroz, Miguel. From big data to humanitarian-in-the-loop algorithms. (Last accessed December 2023). UNHCR Innovation Service: Year in Review 2017. https://www.unhcr.org/innovation/big-data-humanitarian-loop-algorithms/.

The implications of this narrowing of the humanitarian tech space has a stifling impact not only on the efforts towards localization, but also on the vitality and transparency of the tech sector. Some interviewees shared the frustration of small tech and service companies that struggle to understand how NGOs run their procurement, and stressed that the current system only works for big international companies with very large staff counts and extremely deep pockets. As a result, there is a disengagement from small, innovative companies and a tendency towards contracts hoarding through cookie-cutter applications by those in the know of the inner workings of these processes, and a growing vulnerability to vendor lock-in.

From the perspective of the people and communities experiencing extreme vulnerability, this results in a serious infringement of fundamental rights and agency. The options available shrink to a set of standardized processes running mostly outside of the humanitarian protection framework, covered by commercial terms of service by companies not of their choice. It also results in individuals experiencing vulnerability being subjected to foreign tech and data patterns, through platforms designed mostly in foreign languages.

c. Polarization

The critique of traditional international humanitarianism as a foreign policy instrument finds support when we see a persistently limited number of INGOs addressing a growing amount of humanitarian crises, each with deepening gravity.

This skeptical look at the sector attributes the historical ascendance of international NGOs over local ones not to merit, but rather to their role as proxies of their government funders in the so-called development-security nexus.[367] The INGOs compensate for the lack of political resolve and capacity to put an end to war crimes and crimes against humanity in the face of domestic pressure.[368] In other words, some see INGOs as those who clean up the mess because of the politicians' inability to prevent or stop crises.

Our mapping confirms that tech development, like humanitarianism, is often framed in the same foreign policy lens, as offering a supposedly apolitical and publicly acceptable answer to political problems. By transitive property, material humanitarian tech artifacts are in themselves considered

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[367] Oliva, Fabio and Charbonnier, Lorraine. Conflict Analysis Toolbox. (2016). United Nations System Staff College. https://www.unssc.org/sites/default/files/unssc_conflict_analysis_fabio_oliva_lorraine_charbonnier.pdf.

[368] Carbonnier, Gilles. Humanitarian Economics: War, Disaster and the Global Aid Market. (September 2015). Hurst. https://www.hurstpublishers.com/book/humanitarian-economics/.

ethically and morally neutral,[369] a foundational theory that has led to what has been defined as "techno-solutionism."[370]

Recent conflicts have drawn attention to the civilianization of digital warfare through open source investigation and apps that allow users to contribute to a war effort.[371] But this newsy topic is only part of a much bigger discussion on the shared roles and responsibilities of all those actors – including tech companies[372] – handling tech in conflict settings.

The concentration of power and resources in fewer aid and tech actors has concerning consequences for the ethics of the whole humanitarian data ecosystem, and results in the hybridisation of servers, services and processes serving both protected data and metadata, and military, intelligence, or law enforcement information. This trend risks stripping many humanitarian actors of their neutrality – and in some extreme cases even their protection under IHL – putting the aid sector in general, and vulnerable people in particular, at extreme risk of becoming collateral damage because of their involuntary or inevitable association with legitimate military targets (both cyber and physical) in a conflict situation.

At present, however, the risk is being pushed on affected individuals. Their data are funneled through systems and processes without clearly defined boundaries, and possibly are exposed and deconstructed to train, feed, or support the same military operations that are the direct cause of their suffering.

d. Opacity

Our research shows a generalized and common disregard for any form of transparency across sectors and areas of work. Aid actors and tech companies are equally opaque regarding the origins, conditions, modalities, and policies supporting the tech systems deployed on vulnerable communities.

Tech companies fail to disclose the full geographical scope of their humanitarian engagement or to discuss the terms and conditions of their data processing systems, just like humanitarians refuse to

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[369] Bergtora Sandvik, Kristin; Lindskov Jacobsen, Katja; and McDonald, Sean Martin. Do no harm: A taxonomy of the challenges of humanitarian experimentation. (April 2017). IRRC No. 904. https://international-review.icrc.org/articles/do-no-harm-taxonomy-challenges-humanitarian-experimentation.

[370] Molnar, Petra. Technological Testing Grounds: Migration Management Experiments and Reflections from the Ground Up (2020). EDRi and the Refugee Law Lab report. https://edri.org/wp-content/uploads/2020/11/Technological-Testing-Grounds.pdf.

[371] Mačák, Kubo and Vignati, Mauro. Civilianization of Digital Operations: A Risky Trend.(April 5, 2023). Lawfare blog post. https://www.lawfaremedia.org/article/civilianization-digital-operations-risky-trend.

[372] Horowitz, Jonathan. When Might Digital Tech Companies Become Targetable in War? (October 13, 2023). Tech Policy Press blog post. https://www.techpolicy.press/when-might-digital-tech-companies-become-targetable-in-war/.

publish their data protection or protection impact assessments, or even to reveal the full list of tech vendors.

Logically, if it is almost impossible for us to fully gauge the conditions and risks associated with the different steps in the data journey even after a thorough investigation, it is absolutely unreasonable to expect it from a person experiencing vulnerability in the middle of a conflict.

The widespread opacity in the way humanitarian organizations and tech companies build their relationships and partnerships removes any pretension of validity to the consent that is requested from the individuals they declare to serve, and results in a direct violation of the digital rights of at-risk communities.

e. Dependency

The complexity of the aid-tech dynamic is not limited to the accounting books of the actors involved, but includes their programmatic and operational activities. The engagement of tech actors is in fact expanding from improving backend organizational processes, to contributing to first mile, direct delivery of essential humanitarian services, and increasingly even in the targeting of humanitarian assistance. This allows efficiencies of scale and a broader set of operational options, but also requires significant investments to keep both digital and physical systems running in parallel to ensure response does not falter in case of shutdowns or outages.

To support the additional operational expenses, the humanitarian sector had initially betted on the private sector itself. In fact, while the volume from public donors grew by only USD 0.1 billion over the past decade, the volume from private donors – trusts, foundations and individual giving to humanitarian agencies – increased by USD 0.7 billion. More interestingly, while individual giving fell in 2020, contributions from philanthropic foundations and companies both grew (ALNAP 2022).

On one hand, this shows that companies and foundations seem to value the engagement in the aid sector to the point of stepping up to compensate,[373] to a point, the slowing funding rate from institutional and individual sources. On the other hand, available records show that between 2008 and 2012, private companies have contributed USD 1.1bn, equalling 4.6 per cent of total private humanitarian funding[374]which is not radically different from the more recent estimates.

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[373] Technological innovation for humanitarian aid and assistance. (May 2019). European Parliamentary Research Service paper.
https://www.europarl.europa.eu/RegData/etudes/STUD/2019/634411/EPRS_STU(2019)634411_EN.pdf.
[374] Carbonnier, Gilles. Humanitarian Economics: War, Disaster and the Global Aid Market. (September 2015). Hurst. https://www.hurstpublishers.com/book/humanitarian-economics/.

These numbers bear testimony to the reality behind the optimism that permeated the early days of the private sector engagement by humanitarian actors,[375] culminating in the United Nations Global Compact's 2015 Business Action Pledge, when UNHCR alone aimed to raise an annual USD 1 billion by 2025 from private companies.

If anything, the hyped expectations from the past highlight the marginality of the humanitarian market within the priority list of the private sector, which confirms itself as a minor actor in the overall funding ecosystem.

All figures show that humanitarian organizations cannot rely solely on corporate partners for responding to complex crises.[376] The WFP "Private-sector partnerships and fundraising strategy" for 2020-2025[377] shows that UN agencies have learned this lesson, as it looks to private businesses primarily for technical partnerships, while looking at individuals for funds.[378]

There are, however, some areas where demand by humanitarian entities coincides with booming sectors in the tech market. The global digital identity solutions market size is projected to grow from USD 13.7 billion in 2019 to USD 30.5 billion by 2024.[379] More specifically, the biometrics and digital identity document market in the African continent alone is estimated at €1.4 billion (USD 1.5 billion) by specialist firm Acuity Market Intelligence, with some of the biggest players in the industry running huge contracts with documented negative impacts on society.[380]

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[375] Malik, Ammar A.; Mohr, Edward; and Irvin-Erickson, Yasemin. Private-Sector Humanitarians? New Approaches in the Global Refugee Response. (September 2018). Urban Institute report. https://www.urban.org/sites/default/files/publication/99202/private_humanitarian_partnerships_report_1.pdf.

[376] Kurnadi, Fauve and Sinclair, Adaena. Investing in the laws of war: international humanitarian law and the financial sector. (August 3, 2023). Humanitarian Law and Policy blog post. https://blogs.icrc.org/law-and-policy/2023/08/03/investing-in-laws-of-war-ihl-financial-sector/?_hsmi=268867909.

[377] Private-sector partnerships and fundraising strategy (2020-2025). (November 14, 2019). WFP report. https://executiveboard.wfp.org/document_download/WFP-0000108549.

[378] Open Debate on "Advancing Public-Private Humanitarian Partnership". (Sep 13, 2023). What's in Blue report. https://www.securitycouncilreport.org/whatsinblue/2023/09/open-debate-on-advancing-public-private-humantarian-partnership.php.

[379] Digital Identity Solutions Industry Projections, 2020-2024 - Increased Adoption of the Cloud-Based Digital Identity Solutions, Wide Adoption of Authentication Across Verticals. (March 10, 2020) PRNewswire. https://www.prnewswire.com/news-releases/digital-identity-solutions-industry-projections-2020-2024---increased-adoption-of-the-cloud-based-digital-identity-solutions-wide-adoption-of-authentication-across-verticals-301020601.html.

[380] Macdonald, Ayang. Biometric ID is a tool for migrant instrumentalization in Nigeria, study argues. (September 11, 2023). Biometric Update blog post. https://www.biometricupdate.com/202309/biometric-id-is-a-tool-for-migrant-instrumentalization-in-nigeria-study-argues.

The AI and automation market is also experiencing a moment of explosive growth, with PWC estimating that AI could add 14% to global GDP – the equivalent of up to USD 15.7 trillion by 2030 (with 70% of the impact expected only in the U.S. and China).[381]

These areas of new and emerging technologies are also where our mapping reveals the most active and vital dynamics, with pushes from the tech sector to build new forms of cooperation and concerted initiatives by global and regional actors to create conducive environments for joint collaboration across sectors. This again raises the specter of humanitarianism as a testing sandbox for tech development for companies who ultimately aim to target more lucrative markets.

But all of this is not reflected by any comparable growth in the tech budget and funding for humanitarian actors, much less for local aid groups and local communities. The fork between the soaring financial and capital profits and investments related to developing tools extracting data, metadata, and insights from people experiencing vulnerabilities, on one hand, and the financial leverage by humanitarian and grassroots actors to access, deploy, and maintain such technologies in a responsible and ethical way is constantly widening. As a result, the humanitarian sector relies on the goodwill of tech partners, hoping the companies will not change their business model or social impact approach, divest from their human rights team, or decide to put up or raise a price tag once they realize the aid partner is locked in.

f. Extraction

In the short term, the increasing number of humanitarian tech partnerships result in greater extraction of data belonging to affected individuals and their communities, collected and sent to faraway servers for storage and processing.[382]

Clearly, when compared to local storage, foreign cloud storage might offer additional protection to individuals living in fear of their government or of local armed forces, and add some friction to any attempt by these actors to access sensitive information. However, this decision should be left to each and every data owner, with a robust set of options under accessible terms, revocable licenses, and explicit, informed consent. Instead, data flows, storage and access rights are pre-determined through the partnership setup (if at all) and imposed on data owners as a *de facto* situation that they need to accept in order to receive assistance.

The result is that basic data rights such as consent withdrawal, or record edit and deletion, or even remedy in case of accident or harm, are very hard to define and almost impossible to achieve. This

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[381] The macroeconomic impact of artificial Intelligence. (February 2018). PWC report. https://www.pwc.co.uk/economic-services/assets/macroeconomic-impact-of-ai-technical-report-feb-18.pdf.
[382] Tech Cartographies. (Last accessed in December 2023). Website. https://www.cartografiasdainternet.org/en.

topic should warrant a deep conversation within the humanitarian space in terms of guarantees and mechanisms for effective data agency, and consultation of applicable law and norms. Instead, the newly launched UNICC cloud system would take the current system and lock it under the immunity and privileges of the UN.[383]

g. Commodification

Beyond market-driven incentives, our research highlights other factors driving humanitarian tech partnerships, which are often a mix of ethical values, corporate social responsibility, staff satisfaction, visibility, budget governance, and fiscal incentives.

This broad spectrum of motivations may sometimes result in value misalignment among partners, often resulting in the so-called "aidwashing"[384] or as we have already seen, in the worst cases, in forms of humanitarian extractivism[385] and experimentation[386] on the most vulnerable elements of humankind.

However, most digital systems and platforms extract value from hosting or processing a constant stream of raw data and metadata from areas that are usually poorly represented in the normal commercial and academic datasets.

It is not by chance that we witness through our mapping exercise the growing role of advertising-adjacent data collectors, and the progressively emerging role of data services and data brokers. Very often, these operate in the backend of data collection and transfer software, and are almost invisible to field humanitarian users or local communities, since they operate as cloud operators, data brokers, or enterprise service bus (ESB).[387]

An important selling point for introducing tech into humanitarian processes is the promise to reduce friction and wasteful intermediaries in between affected individuals and those offering assistance. So far, the humanitarian engagement with private actors had led to the opposite result, by crowding the

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[383] Convention On The Privileges And Immunities Of The United Nations. (February 13, 1946). UN treaty. https://www.un.org/en/ethics/assets/pdfs/Convention%20of%20Privileges-Immunities%20of%20the%20UN.pdf.

[384] Martin, Aaron. Aidwashing Surveillance: Critiquing the Corporate Exploitation of Humanitarian Crises. (March 16, 2023). Surveillance & Society article. https://ojs.library.queensu.ca/index.php/surveillance-and-society/article/view/16266.

[385] Bergtora Sandvik, Kristin. Humanitarian extractivism. (October 2023). Manchester University Press. https://manchesteruniversitypress.co.uk/9781526173355/.

[386] Bergtora Sandvik, Kristin, Jacobsen, Katja Lindskov, and McDonald, Sean Martin. Humanitarian experimentation. (November 28, 2017). Humanitarian Blob & Policy blog post. https://blogs.icrc.org/law-and-policy/2017/11/28/humanitarian-experimentation/.

[387] Flaming, Mark and Jeník, Ivo. Digitization in Microfinance: Case Studies of Pathways to Success. (October 2021). Consultative Group to Assist the Poor working paper. https://www.cgap.org/sites/default/files/publications/2021_10_Working_Paper_Digitization_in_Microfinance.pdf.

humanitarian space with an endless stream of digital third party providers, suppliers, contractors, and sub-processors, most of them with a clear commercial interest in manipulating or extracting the extracted metadata even before they become an official humanitarian database.

If anything, the most relevant change is that instead of being part of the local community and environment, intermediaries are now also from foreign countries, mostly the wealthy ones, adding one more layer to the exploitative and extractive nature of opaque digital systems.

h. Dataveillance

Possibly the most recurrent comment we received during the mapping is the reassurance that all data transferred to or analyzed through third party systems and private platforms is anonymized or de-identified and thus safe. This is essential to those we interviewed, as most expectations and ambitions for digital transformation of the humanitarian sector rely on the data being openly shared.

Unfortunately, as open data can be combined[388] — or mosaicked[389] — with other datasets to reveal new information for humanitarian purposes, the same methods can do harm by ethnically, racially, or demographically profiling certain individuals or communities.

As recalled by Nathaniel Raymond, an expert in digital risk in humanitarian data, "Demographically Identifiable Information (DII) is being generated by aid activities that provide highly actionable and granular information about when PoC (persons of concern) groups may be engaged in specific activities at distinct times and locations. DII, which may or may not include any PII, is increasingly the fuel in the tank of artificial intelligence, the basis of predictive analytics, and a significantly more valuable commodity to aid workers and malicious threat actors alike than an individual's PII alone."[390]

As the data is open but the overall tech stack, providers list, and data pipelines of the actors handling it is not, the risks lurk unseen. An aid actor might well be convinced to share a harmless piece of anonymized data, all the while contributing a key tassel to an invisible digital mosaic for sale to advertisement, intelligence, or other unscrupulous actors.

Sometimes, even basic anonymization is not possible, as the whole point is – for example – to identify a victim. Anthropologist Katherine Verdery, commenting on the Clearview AI facial recognition system

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[388] Collings, Page. (November 10, 2023). EFF blog. https://www.eff.org/deeplinks/2023/11/debunking-myth-anonymous-data.

[389] "The mosaic effect is the combination of multiple streams of data from diverse sources together to target populations. See also Capotosto, Jill. The mosaic effect: the revelation risks of combining humanitarian and social protection data. (February 9, 2021). Humanitarian Law and Policy blog post. https://blogs.icrc.org/law-and-policy/2021/02/09/mosaic-effect-revelation-risks/.

[390] Nathaniel A. Raymond. Conceptualizing digital risks to Persons of Concern in the WhatsApp Era. (April 2021). UNHCR. https://www.unhcr.org/innovation/wp-content/uploads/2021/10/Conceptualizing-Digital-Risks-to-PoCs-in-the-WhatsApp-Era-.pdf.

in Ukraine, says that dead bodies become a perfect cover: "In the name of the dead, facial recognition is given a humanitarian pretext that obscures its role in emerging mass surveillance and future automated violence."[391] Studies on AI research, and computer vision in particular, have produced the same damning conclusions.[392]

We apply similar skepticism to the claims of improved reliability and fraud-proofing of biometric registration systems over more traditional digital approaches,[393] and beseech academics to study the existing evidence. What is certain, though, is that biometric systems are complex both on the technical and the governance sides, with most commercial solutions allowing several private actors to handle the data or the resulting template. Once more, their opaque contractual and technical relationships makes it impossible to ground any analysis on evidence, and forces implementing aid actors to deploy these systems on vulnerable populations based mostly on trust and reputation of the company, resulting in heightened risks for vulnerable individuals.[394]

Be it anonymized or non-anonymized, the use of digital technologies creates corresponding 'digital bodies'[395] for populations affected by conflict and natural hazards, leaving them little to no say or control over the corpus. The resulting dataveillance[396] – the systematic monitoring of people or groups, by means of personal data systems in order to regulate or govern their behavior – is becoming a central practice of aid.

The growing pervasiveness of this phenomenon mixed with the radical commodification approach by data brokers should push humanitarian actors to consider that the digital bodies and related digital footprints they help to create might not be simply a byproduct of their life-saving assistance, but the main product for some of their partners.[397] Aid and tech actors should pause and consider that even

[391] Hagerty, Alexa. In Ukraine, Identifying the Dead Comes at a Human Rights Cost. (February 22, 2023). Wired. https://www.wired.com/story/russia-ukraine-facial-recognition-technology-death-military/.

[392] Ria Kalluri, Pratyusha; Agnew, William; Cheng, Myra; Owens, Kentrell; Soldaini, Luca; and Birhane, Abeba. The Surveillance AI Pipeline. (October 17, 2023). Arxiv paper. https://arxiv.org/abs/2309.15084.

[393] Tsui, Quito and Perosa, Teresa. New Report: Biometrics In The Humanitarian Sector [2023]. (July 27, 2023). The Engine Room. https://www.theengineroom.org/biometrics-humanitarian-sector-2023/.

[394] Nwankpa, Joseph K. Registering refugees using personal information has become the norm – but cybersecurity breaches pose risks to people giving sensitive biometric data. (July 18, 2023). The Conversation blog post. https://theconversation.com/registering-refugees-using-personal-information-has-become-the-norm-but-cybersecurity-breaches-pose-risks-to-people-giving-sensitive-biometric-data-208166.

[395] Bergtora Sandvik, Kristin. Wearables for something good: aid, dataveillance and the production of children's digital bodies. (May 22, 2020). Information, Communication & Society article. https://www.tandfonline.com/doi/full/10.1080/1369118X.2020.1753797.

[396] Degli Esposti, Sara. When big data meets dataveillance: the hidden side of analytics. (May 9, 2014). Surveillance & Society article. https://ojs.library.queensu.ca/index.php/surveillance-and-society/article/view/analytics.

[397] Bergtora Sandvik, Kristin. Wearables for something good: aid, dataveillance and the production of children's digital bodies. (May 22, 2020). Information, Communication & Society article. https://www.tandfonline.com/doi/full/10.1080/1369118X.2020.1753797.

official intelligence community reports flag the strategic importance of any data collected by consumer technologies.[398]

i. Derisking

Born under the blessing of the humanitarian imperative[399] and the Good Samaritan Rule,[400] humanitarians have a long history of struggling to improve their accountability[401] towards affected populations. This dynamic continues in digital transformation, as instead of pointing at clear and actionable policies and mechanisms, accountability for digital initiatives is further diluted across a longer chain of actors.

Aid actors have instead made considerable advances in building a framework of reference, and integrating it into their internal policies. The current portfolio of instruments available is very broad and includes a dozen resources, some of them borrowed from the Business and Human Rights field.[402] Some humanitarian organizations barely set up a data protection unit, but others showed more constructive and progressive attitudes. For example, UNHCR has an Digital Innovation Fund[403] Project exploring approaches to strengthen its human rights due diligence in relation to digital tech.[404] ICRC

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[398] Tau, Byron; Mollica, Andrew; Haggin, Patience; and Volz, Dustin. How Ads on Your Phone Can Aid Government Surveillance. (October 13, 2023). The Wall Street Journal article. https://www.wsj.com/tech/cybersecurity/how-ads-on-your-phone-can-aid-government-surveillance-943bde04.

[399] The right to receive humanitarian assistance, and to offer it, is a fundamental humanitarian principle which should be enjoyed by all citizens of all countries. As members of the international community, we recognise our obligation to provide humanitarian assistance wherever it is needed. For more: The Code of Conduct for the International Red Cross and Red Crescent Movement and NonGovernmental Organisations (NGOs) in Disaster Relief. (Last accessed January 2024). International Federation of Red Cross and Red Crescent Societies, ICRC. https://www.icrc.org/en/doc/assets/files/publications/icrc-002-1067.pdf.

[400] Under the Good Samaritan Rule, if a Good Samaritan provides services for another, either gratuitously or for compensation, the Good Samaritan assumes a duty to use reasonable care. The liability threshold in case these services do not impede or contribute to harm is higher than normal, requiring evidence of negligence. For more: Good Samaritan Rule. (January 2022). Legal Information Institute webpage. https://www.law.cornell.edu/wex/good_samaritan_rule.

[401] Hilhorst, Dorothea; Melis, Samantha; Mena, Rodrigo; and van Voorst, Roanne. Accountability in Humanitarian Action. (December 3, 2021). Refugee Survey Quarterly article. https://academic.oup.com/rsq/article/40/4/363/6448557?login=false.

[402] Some of these instruments are the UN Guiding Principles on Business & Human Rights and its reporting framework; UNDP Heightened Human Rights Due Diligence for Business in Conflict-Affected Contexts: A Guide; UNSG's Guidance on Human Rights Due Diligence and Digital Technologies; ICRC handbook on data protection in humanitarian action; Working Group on B&HR Report on business, human rights and conflict-affected regions: towards heightened action; Access Now Tech and conflict: a guide for responsible business conduct; OHCHR B-Tech Project The Feasibility of Mandating Downstream Human Rights Due Diligence: Reflections from technology company practices; A/HRC/50/56: The practical application of the Guiding Principles on Business and Human Rights to the activities of technology companies (mentioning the "smart mix" approach); and the OECD Guidelines for Multinational Enterprises

[403] Digital Innovation Fund. (Last accessed January 2024). UNHCR Innovation Service. https://www.unhcr.org/innovation/digital-innovation-fund/.

[404] Information shared directly by stakeholders.

has supported several independent studies on data protection, messaging apps, and other sensitive topics, and approved a restrictive policy on biometrics. A few INGOs, including Oxfam, have been pioneering a different, more critical approach to data protection.

On the other hand, humanitarian agencies and NGOs are implementing tech solutions based on financial accessibility and purpose-appropriateness, rather than on ethics and accountability compliance. As far as we could tell through our mapping, no humanitarian actor runs a due diligence process on the vendor or partner, nor on their suppliers and subprocessors, looking for ethical flags or conflicts of interest such as supporting military activities within the same country. Often, NGO staff fail to submit a DPIA for each digital solution to their data protection officer for approval, and when they do, the assessment is usually kept private and not shared, even upon direct request.

Tech companies may customize or adjust their system to fit the NGO's needs, but most often do so without adhering to any humanitarian charter, set of principles, or protection guidance, even when they *de facto* replace core humanitarian functions. Despite being the only ones to know exactly how their digital systems are built, the responsibility of running DPIAs is pushed down on humanitarian actors[405] who often have no knowledge of the software, access to it, nor leverage to demand changes to it. While leaving tech companies to assess themselves brings its own risks, a model where responsibilities for data protection and due diligence compliance are shared between all partners involved would go far to make sure these processes are meaningful, all actors understand the implications of their decisions, and the responsibility for accountability mechanisms can be more easily distributed among the parties.

6. Recommendations

a. Recommendations to donors

- Assess, adapt, implement, and monitor the Donor Principles for Human Rights in the Digital Age,[406] notably principle 4 requiring a human rights impact assessment process in programs with digital components, and principle 8 prioritizing digital security and safety.
- Promote collaborative and non-competitive processes when facilitating partnership models, including incentives for more diverse companies to cooperate based on common standards. More broadly, we also call on donors to avoid encouraging tech solutionism and dependence on a limited number of tech providers.
- Revise funding modalities to allow for more agile and flexible management of resources aimed at the purchase or development of digital products and services, in order to create a conducive

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[405] Cloud DPIA Resource Center. (Last accessed December 2023). Google Cloud webpage. https://cloud.google.com/privacy/data-protection-impact-assessment.
[406] Donor Principles for Human Rights in the Digital Age. (2023). FOC webpage. https://freedomonlinecoalition.com/donor-principles-for-human-rights-in-the-digital-age/.

environment for reasonable and fair participation by more companies in the tender process, and to be more inclusive of localized or community-rooted data and tech organizations.

- Create collaborative mechanisms to increase funding for cybersecurity programmes led by, or benefitting humanitarian organizations, especially for small to medium-size groups, or those handling extremely sensitive data.
- Set an expectation that risk management be disclosed, through publication of adequate information about core assessments, including DPIA, HRIA, and possibly Protection assessments, realized as part of the deployment of digital systems in humanitarian activities, as a requirement to all recipients of funding. At the very least, donors should request from partners and companies the same level of disclosure required by the UN Guiding Principles Reporting Framework for salient human rights issues,[407] and encourage innovative approaches such as the UNHCR Human Rights Due Diligence toolkit.[408]
- Follow emerging examples[409] of donors or public authorities leveraging their authority to facilitate a streamlined process running sector-wide DPIA (on essential backend tech systems such as cloud hosting or processing) or due diligence assessments (on most systems), especially when the power imbalance or the complexity of the technology would hinder a full and meaningful assessment.
- Advocate with the tech community for more transparency in the handling, segregation, and protection standards of all humanitarian related data under their control.
- Request organizations receiving humanitarian funding to fully disclose the details of their collaboration with tech actors for the purpose of the activities covered by the grant, including type and status of the partnership, and to request human rights due diligence on client list and supply and value chains as already indicated by UN Human Rights as best practice in Human Rights Due Diligence.[410]
- Promote a global discussion on the importance and gravity of digital- and digital-adjacent breaches to IHL by all parties involved in a humanitarian situation, and public debate on the importance of protecting digital humanitarian space from hostile actions by warring parties and of separating the humanitarian data ecosystem and the military one.

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[407] UN Guiding Principles Reporting Framework. ((Last accessed January 2024) UNGP Reporting webpage. https://www.ungpreporting.org/framework-guidance/.
[408] Digital Innovation Fund. (Last accessed January 2024). UNHCR Innovation Service. https://www.unhcr.org/innovation/digital-innovation-fund/.
[409] Sjoera. New DPIA for the Dutch government and universities on Microsoft Teams, OneDrive and SharePoint Online. (February 21, 2022). Privacy Company. https://www.privacycompany.eu/blogpost-en/new-dpia-for-the-dutch-government-and-universities-on-microsoft-teams-onedrive-and-sharepoint-online
[410] For example, see Mandating Downstream Human Rights Due Diligence (September 13, 2022), available at https://media.business-humanrights.org/media/documents/mandating-downstream-hrdd.pdf. For specific use cases, please refer to The Feasibility of Mandating Downstream Human Rights Due Diligence: Reflections from technology company practices. (2022). UN Human Rights B-Tech. https://www.ohchr.org/sites/default/files/documents/issues/business/2022-09-13/tech-downstream-hrdd.pdf

- Facilitate dialogue and deliberation between digital rights advocates, affected parties, and humanitarian tech communities, by promoting and supporting safe spaces for critical discussion and knowledge sharing among involved actors including affected communities.
- Include emergency internet connectivity for communities, and more generally connectivity as part of emergency preparedness, responses, and aid, in the portfolio of humanitarian funding streams, and contribute to efforts to end internet shutdowns and extend universal, open, secure, interoperable, stable, and affordable access to internet, as proposed in 2020 in the UN Secretary-General's Digital Roadmap.[411]

b. Recommendations to the humanitarian community

- Adhere to UN Guiding Principles on Business and Human Rights[412] in partnership-building with profit and nonprofit tech actors, including through contractual provisions and in cooperation with redress and grievance mechanisms.
- For UN entities, build on existing good practices and integrating emerging guidance on human rights due diligence and digital technology such as the UN Human Rights-led system wide guidance on human rights due diligence and impact assessments in the use of new technologies, and to heed the call of the UN Secretary General[413] to engage "with civil society, external experts and those most vulnerable and affected."
- Set up and manage a common data accountability system connecting all DPOs and ideally an external independent mechanism to allow individual recourse and actionability of their digital rights across all relevant data controllers at once, as has been requested since at least the RedRose hack in 2017.[414]
- Reevaluate any use of deployment of technology identified as enabling surveillance or a surveillance-adjacent system, as described in this report.
- Set up and manage a public tracking system to efficiently and transparently disclose data incidents and institutional responses.
- Immediately track, monitor, and disclose their humanitarian data ecosystem and footprint, inclusive of their official tech stack and due diligence documentation, including all related assessments.

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[411] Report of the Secretary-General Roadmap for Digital Cooperation. (June 2020). UN. https://www.un.org/en/content/digital-cooperation-roadmap/.
[412] Guiding Principles on Business and Human Rights: Implementing the United Nations "Protect, Respect and Remedy" Framework (January 1, 2012). UN OHCHR webpage. https://www.ohchr.org/en/publications/reference-publications/guiding-principles-business-and-human-rights.
[413] Road map for digital cooperation: implementation of the recommendations of the High-level Panel on Digital Cooperation. (May 19, 2020). Report of the UN Secretary General. https://documents-dds-ny.un.org/doc/UNDOC/GEN/N20/102/51/PDF/N2010251.pdf?OpenElement.
[414] Raymond, Nathaniel A.; Scarnecchia, Daniel P.; and Campo, Stuart R. Humanitarian data breaches: the real scandal is our collective inaction. (December 8, 2017). The New Humanitarian article. https://www.thenewhumanitarian.org/opinion/2017/12/08/humanitarian-data-breaches-real-scandal-our-collective-inaction.

- Demand complete visibility over data access by third parties and any automated processes across the full tech stack deployed as part of humanitarian services.
- Strengthen preparatory work and contingency plans by connectivity actors in conflict-affected areas, as aid relies more and more on digital channels and systems.
- Raise the need for protection of the humanitarian digital space, and the option for calling a digital ceasefire during escalating conflicts that endanger aid actors and communities online.
- Finally concretize the call made in the UN Secretary-General's Digital Roadmap to include connectivity as part of emergency preparedness, responses, and aid, including working through the inter-agency Emergency Telecommunications Cluster.[415]
- Promote a global discussion on mobile and data connectivity as a humanitarian priority for participating communities, and not only for aid actors.
- Revise procurement and financial processes to introduce simpler fast-track methods to create a conducive environment for reasonable and fair participation by smaller companies.
- Set up dedicated programmes for digital and cyber capacity building to less-resourced humanitarian aid providers based on sector-agreed standards for technical requirements and specifications, especially for specialist and management positions.

c. Recommendations to tech companies

- Apply the UN Guiding Principles on Business and Human Rights [416]as baseline for further improvement to any deployment or application of tech-related products in situations of humanitarian crisis, including through heightened human rights due diligence, enacting contractual provisions[417] and providing redress and grievance mechanisms.[418]
- Take mitigation measures, such as compartmentalizing, where feasible, the military and civilian uses of the goods and services they offer, when storing or processing military and civilian data and providing other shared services and infrastructure,

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[415] Report of the Secretary-General Roadmap for Digital Cooperation. (June 2020). UN. https://www.un.org/en/content/digital-cooperation-roadmap/.

[416] Guiding Principles on Business and Human Rights: Implementing the United Nations "Protect, Respect and Remedy" Framework (January 1, 2012). UN OHCHR webpage. https://www.ohchr.org/en/publications/reference-publications/guiding-principles-business-and-human-rights.

[417] Examples can be found in the resources developed by UN Human Rights as guidance on Human Rights Due Diligence, for example Mandating Downstream Human Rights Due Diligence (September 13, 2022), available at https://media.business-humanrights.org/media/documents/mandating-downstream-hrdd.pdf. For specific examples, please refer to The Feasibility of Mandating Downstream Human Rights Due Diligence: Reflections from technology company practices. (2022). UN Human Rights B-Tech. https://www.ohchr.org/sites/default/files/documents/issues/business/2022-09-13/tech-downstream-hrdd.pdf

[418] UNDP (June 16, 2022). Heightened Human Rights Due Diligence for Business in Conflict-Affected Contexts. https://www.undp.org/publications/heightened-human-rights-due-diligence-business-conflict-affected-contexts-guide.

- Proactively disclose to aid partners any client relationships, particularly relationships with State actors, that may pose potential conflicts of interest or threaten the confidentiality, availability, or integrity of humanitarian data.
- Refrain from running unauthorized data training, manual analysis, or automated algorithmic processes on sensitive data or metadata coming from humanitarian-related activities.
- Develop a set of humanitarian-specific support materials to help humanitarian actors in drafting DPIAs or other assessments, instead of delegating all data protection, privacy, and protection assessment work to downstream partners such as NGOs.
- Adhere and incorporate those plans developed by civil society, including Access Now guidance on tech and conflict,[419] into business development and decision-making, and consult both internal cross-functional human rights expertise as well as external expert stakeholders.
- Improve the openness and transparency of their tech stack and data practices, especially when offering or providing solutions to support humanitarian action.
- Prioritize longer term partnerships, invest in better understanding core work and activities of the aid sector, and strengthen their commitment to continue providing support to essential humanitarian services.
- Avoiding vendor lock-in practices, and eventually facilitating the portability and off-ramping towards other solutions when the agreement sunsets.

d. Recommendations to the local aid actors and communities

- Document, track, and report to local authorities and digital rights organizations any abuse, breach, wrongdoing, or malpractice by humanitarian actors or their partners, and enhance visibility over emerging issues.
- Demand access to their data as owned by humanitarian actors and exercise their rights to modify or delete their records, in accordance with data protection standards, if needed with support by digital rights organizations.
- Reach out to Access Now and other digital rights allies to report any ongoing legal initiatives stemming from the exercise of their digital rights against a humanitarian actor or their tech partners.
- Continue building stronger digital security and cyber resilience literacy, policies, and practices, including through training and collaboration with providers in the CiviCERT network.

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[419] Oribhabor, Isedua. Tech and conflict: a guide for responsible business conduct. (May 18, 2023). Access Now webpage. https://www.accessnow.org/guide/tech-and-conflict-a-guide-for-responsible-business-conduct/.

For more information, visit www.accessnow.org.

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Access Now defends and extends the digital rights of people and communities at risk. As a grassroots-to-global organization, we partner with local actors to bring a human rights agenda to the use, development, and governance of digital technologies, and to intervene where technologies adversely impact our human rights. By combining direct technical support, strategic advocacy, grassroots grantmaking, and convenings such as RightsCon, we fight for human rights in the digital age.