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**HUMANITARIAN ACTION
AND THE DIGITAL AGE**
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Humanitarian Action and the Digital Age

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HUMANITARIAN ACTION AND THE DIGITAL AGE

Catarina Mauritti Granjo

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Abstract This paper analyses the benefits of technology in the framework of humanitarian action by first investigating its place within the global context of current events. Since the beginning of the century, innovative approaches have been greatly encouraged as a response to the need for the modernization of relief provision. Technology carries great potential to positively impact the future of humanity and, by extension, humanitarian action. Nevertheless, it is vital that transformation through technological innovation involve a human-centered approach. To demonstrate this, three technologies are selected and investigated based on characteristics that make them especially suited to humanitarian action: Artificial Intelligence for Humanitarian Action, Flying Labs, and Smart Communities. It is held that these suggest a yet unrealised potential to establish long term solutions to the challenges of meeting local needs and, thereby, augmenting community resilience. Fundamentally, a set of widely recognized guiding principles are now of vital significance if technologies are to function without incurring the costs resulting from the disconnection between aid givers and affected communities, but instead, act as a catalyst for increased cooperation among all sectors while still maintaining the true priorities of HA.

Keywords: Technology, Humanitarian Action, Innovation, Human Centre Approach

Introduction

The aim of this paper is to examine the current role of technology as applies to humanitarian action (HA) and to highlight the various advantages of these recent innovations. Given that context is key to comprehension, a strong foundational understanding of the humanitarian landscape is an essential point of departure if this paper is to provide a map clearly describing the impact of technological innovation on humanitarian assistance today. It is the principal creed of all humanitarian actors that every victim of a crisis has the right to protection, aid, and the basic needs fundamental to the preservation of human dignity. This is why underlying the decisions of all humanitarian actors are the four fundamental moral principles of humanitarian response that guide both actors and organisations in their work: humanity, neutrality, impartiality, and independence (Murphy & Ansari, 2018, p. 49-88). As the assistance provided by organisations, agencies and inter-agencies is economically divided between the public, private and social sectors, achieving effective humanitarian responses requires that these three sectors cooperate and collaborate with each other, and that in so doing they address local needs holistically (ibidem, p. 49-88). Altogether, this landscape depicts a vastly intricate system that current events only serves to further complex.

The paper progresses in three stages. An initial exploration of the humanitarian landscape sheds light on the current HA paradigm which encompasses both HA's part on the world stage amidst the most trying

global challenges as well as its capacity to adapt and transform in response to change. Next, focusing on technology as a tool to modernise HA reveals how it is applied to provide new and innovative solutions by major institutions. While the United Nations and other major donors (both in the public and the private sector) advocate that technology can pave the way to more inclusive and effective relief, global agendas, such as the Agenda 2030 and the SDGs, further propel this tendency. Consequently, technologies now occupy an increasingly significant position in HA. Lastly, the present applications of technology are examined along with some of the main considerations for practical and effective implementations in the field. The method used here to qualify these traits revolves around three case studies: Artificial Intelligence for Humanitarian Action, Flying Labs, and Smart Communities. These technologies are representative of the most used technologies in the humanitarian sector; namely artificial intelligence (AI), drones (UAVs), and cash or voucher assistance (CVA). The paper concludes with a discussion about the major concerns that currently face humanitarian action and its capacity for modernisation through innovation.

Current Paradigm and Humanitarian Action

Since the end of the Cold War, the world has been led economically and militarily by the United States, however, the increasing fragmentation of this system has led to a paradigm shift, while at the same time the coronavirus pandemic appears to be accelerating this process with some even saying that the “America Era” may be nearing its end (Layne, 2012). Among the shifting powers, China (the original epicentre of the Covid-19 pandemic) appears to possess the technical and scientific means, as well as the political means, to overcome such a crisis, placing itself today in the position of international strategic co-operator. Besides sending medical teams, equipment, and materials to more than 100 countries around the world, China has also recommenced industrial and commercial activity at both the national and

international level well before any other country (Blachette et al, 2020). Despite strong suspicions that China has omitted relevant information on the origin and spread of the pandemic, the new power's political and economic position has been strengthened given the weak response to the Covid-19 crisis on the part of developing countries (Schuman, 2020).

COVID-19 has definitively marked 2020 as the year in which a global threat managed to deepen the divisions between countries and weaken international ties: *"Russian-Western relations are now at their worst since the early 1980s. US-Russian nuclear arms control has virtually ended. US-China relations have reached their lowest point since the late 1960s. Sino-Indian relations have suffered their worst violence since 1975. Transatlantic relations are at their most uncertain since the late 1940s"* (Gould-Davies, 2020). Furthermore, the combined effect of these threats plus attacks by the United States (a former major donor) upon international institutions responsible for maintaining cooperation, has resulted in a loss of support, resources, and membership among organizations. The effects of this situation are especially severe given that it is these organizations which are responsible for tackling collective problems by sharing information and expertise, deliberating agreements as well as joint policies, and coordinating implementation. The widening divide between the demand for cooperation and the ability to maintain it is telling of an impending crisis at an international scale (Gould-Davis, 2020). Thus, the pandemic has not only been an obstacle to globalisation, but it has also revealed its weaknesses.

The global economy of 2019 up to the present may best be described as fragile yet growing. With the current lockdowns and the suspension of industry, production, and non-core services in most countries, the world has undergone drastic changes spelling out profound implications in living conditions and social security of populations, particularly aggravated in the more fragile stratum of society (impoverished and unskilled workers, migrants, and the inactive population in general). Economic inactivity, closure of borders and fear of the invisible enemy are leading to a hardening of migration policies throughout the world and the emergence of a new migration rhetoric around the "securitisation of health" (Fasani & Mazza,

2020). Due to the restrictions placed on circulation, asylum seekers and irregular migrants are finding it harder to gain protection. An obvious example of this is the civil war in Libya where despite international calls for a “humanitarian pause” asylum seekers and migrants were turned away by European governments. Search and landing operations in the Mediterranean were interrupted, notwithstanding that international maritime law clearly states that they have the “duty to save” refugees and asylum seekers in distress at sea (Chugh, 2020). According to the OECD Economic Outlook 2020, vaccination campaigns, concerted health policies and government financial support are expected to lift global GDP by 4.2% in 2021 after a fall of 4.2% in 2020, but even by the end of 2021 many economies will have shrunk from 2019 pre-pandemic levels.

Recent decades have seen a dramatic rise in global pandemics. From the SARS pandemic in 2003, to Avian Influenza in 2006, H1N1 in 2009, Ebola in 2014, the appearance of the Zika virus in Latin America in 2015 and the current SARS-CoV-2 in 2019. These developments are inextricably bound up in modern socio-technical developments and processes of globalization. Advances in global air travel, agricultural technology, urbanization, and pollution all facilitate the appearance and spread of contagious diseases (Ramalingam, 2015 Apud by Wilson & Jumbert, 2018, p.3-13). Simultaneously, new media and technologies have also come to play a profound role in the way that global pandemics are identified, traced, understood, managed, treated, and perceived (Wilson & Jumbert, 2018, p. 3-13).

The Covid-19 pandemic has provided countless examples of how communication technologies play an increasingly significant role in different aspects of global pandemic response such as in mitigating risk and improving prevention (Wilson & Jumbert, 2018). The 2019 report of *Technological Innovation for Humanitarian Aid* from the European Commission lists several of these advances: geospatial technologies, unmanned aerial vehicles (UAVs) to survey affected areas, mobile phones and social media platforms used by crisis victims, biometric identification to facilitate humanitarian support, a shift to digital payments as relief provisions with e-vouchers and mobile money (European Parliament, 2019, p. 10). In sum, the humanitarian

landscape is being constantly transformed by technology while its widespread availability and adoption allows actors to better address the challenges facing humanitarian assistance. This point is well illustrated by the formulation of the 'Agenda for Humanity' at the first World Humanitarian Summit in 2016 and the creation of the 'Global Alliance for Humanitarian Innovation' which aims to accelerate transformative improvements in humanitarian action by creating a shared space for the development of innovative tools, approaches and processes (WHS, 2016, p. 21-27).

The continuous chain of humanitarian disasters be it floods in Southeast Asia, the locust plague in East Africa, the devastating explosion in the port of Beirut or the destruction caused by wildfires in Brazil and California or hurricanes in the Caribbean gulf, show that crises and grievances do not stop because of COVID-19. On the contrary, they are all the results of a dysfunctional system that puts corporate profit above the rights and well-being of people and the planet." (Martens, 2020, p. 13)

Moreover, the Sustainable Development Goals (SDGs, aka the 2030 Agenda) and the Paris Agreement now constitute the framework for national action and global cooperation on sustainable development, to which the member states of the United Nations have fully committed. The SDGs focus on time-bound targets for Prosperity, People, Planet, Peace and Partnership-known as the five Ps. The Paris Agreement states that countries are to achieve net-zero greenhouse-gas emissions by the year 2050 (Sachs et al, 2019, p. 805). The 2030 Agenda pledges that '*no one will be left behind*' in implementing the SDGs which explicitly targets a sense of inclusiveness and non-discriminatory universality '*for all*' (Leach et al, 2018). However, countries are not on an equal footing as regards their ability to take responsibility for these objectives or to meet them even at a later date. Such a transformation can only succeed if it is underpinned by the *leave-no-one-behind* principle and strategies must identify and address the needs of the poorest (Kraas et al, 2016). This conviction was emphasized in the closing remarks of the 2015 OCHA Global Humanitarian Policy Forum in New York where Hansjoerg Strohmeyer chief of the Policy Development and Studies Branch

of OCHA challenged the current humanitarian model — “where extended displacements can run for 10 years using the same mode of operation”. He concludes his speech by affirming that the Sustainable Development Goals provide an opportunity where positive change can be achieved through innovating new ways of working within the system (McClure, 2015).

Considering that technological advances have always fundamentally influenced and characterized civilization, it comes as no surprise that any discourse about HA often ends in a discussion about technology. The general understanding is that it is an invaluable means by which humanitarian assistance may progress toward more concrete and effective courses of action. As developing nations already account for most of the communications technology in use today, intelligent and innovative approaches are what is now needed to optimize their effectiveness. According to World Humanitarian Data and Trends 2015 (Barajas, 2016), an estimated 5.5 billion of the 7 billion mobile phone subscriptions worldwide are from developing countries, as are the 2 billion internet users out of the global approximate of 3.2 billion. Within the different stages of humanitarian response, technologies contribute to a positive feedback cycle generating greater impact and providing opportunities for both affected communities and those actively involved in HA. Affected communities are often enabled to quickly transform themselves into first responders, send requests and messages, provide critical information, match assistance needs with providers or support rapid damage assessments. Such trends have been confirmed by reports such as *Humanitarianism in the Network Age* (Gilman & Noyes, 2013) and *World Disaster Report* (Vinck, 2013). These two reports demonstrate a need for a transformation of the traditional relationships between humanitarian actors, donors, and communities. Adaptability and change should be understood as vital to the process through which the future of HA will be formed. As a tool of HA, technologies may also help in promoting a new people-centred framework.

Given the transformative nature of innovations, they do not adhere to traditional structures and processes. In the case of humanitarian

assistance, the technologies can be applied to various activities of the humanitarian programme cycle (HPC). To provide a structured overview, the *Technological Innovation for Humanitarian Aid* report from the European Commission (2019, p. 10) has categorised the technological innovations under three main stages inspired by the UN cluster approach: firstly, Preparedness — including activities such as needs assessment and analysis, strategic planning and mobilisation; secondly, Response — including activities such as humanitarian service delivery, programme implementation and monitoring; thirdly, Recovery — including reconstruction and disaster risk reduction, and activities facilitating increased resilience and opportunities for those affected by crisis.

Methodology

To elucidate the advantages of technology in HA, this paper has concentrated on three examples that are already in use on the ground: Artificial Intelligence for Humanitarian Action, Flying Labs, and Smart Communities. As they are among the most common technologies in the humanitarian sector, artificial intelligence (AI), drones (UAVs) as well as cash and voucher assistance (CVA) were selected to represent potential technologies for building long term solutions and resilience in local communities. Now adopted by most organizations in the field, the advanced capacity of AI to analyse data makes it an impressive tool for disaster support — *“AI maybe used to identify weather disasters, track displaced people, and predict population flows and future crises”* (Madianou, 2019). The Microsoft initiative *“AI for Humanitarian Action”*, in partnership with the United Nations, supports non-profit and humanitarian organizations involved with disaster response, refugees and displaced people, human rights, and the needs of women and children (Microsoft, 2018). Equally as relevant in post-disaster situations, UAVs are used to provide high resolution images of affected areas in a fraction of the time it takes to achieve the same results through traditional methods, which have been

known to take several weeks (FAO, 2019). Moreover, UAVs help build resilience in affected communities, thanks to their accessibility and simplicity allowing individuals to easily learn to operate and adapt them to their own necessities (GFDRR, 2017). With the aim of educating communities in the application of drones (UAVs), robotics, data, and AI, “Flying Labs” is a network of hubs that focuses on improving local aid, health, development, and environmental sustainability (Flying Labs, 2018). Finally, owing to the economic flexibility afforded to refugees, CVA has emerged as a major game changer in the implementation of humanitarian assistance, especially since it is fast becoming a common modality of relief (Maphosa, 2016). One of the most exemplary initiatives making progress with this technology is “Smart Communities” created by MasterCard and Western Union in partnership with UNHCR (United Nations High Commissioner for Refugees). Focused on promoting self-reliance for refugees and host communities, it is a mobile application, also known as a digital wallet, that offers a high degree of utility in saving money, receiving payments and paying back extended credits through digital exchange (Mastercard, 2017, p. 1-10).

As well as an in-depth examination of each technology, two separate dimensions have also been analysed to illustrate the potential of these tools: They are first explored for their advantages in attaining the goals of the multilateral agenda better known as the Sustainable Development Goals (SDG); and, subsequently, for their advantages in facilitating each step of the Humanitarian Programme Cycle (HPC): “Preparedness”, “Response” and “Recovery”.

The Sustainable Development Goals are meant to guide the process of articulating relief and development, notwithstanding that development agendas and immediate assistance have completely different mandates and that integrating both in one global agenda poses many challenges and does not always unfold according to plan (Guinote, 2020, p. 1051-1066). After a careful examination of multiple reports dealing with technology in the humanitarian landscape, 51 technologies were mapped according to their

correlation with the SDGs while at the same time considering their potential in managing certain types of catastrophes and crises. This project was meant as an experiment to illustrate the shared objective of the SDGs and HA: the need to build resilient communities. The open-source platform Kumu was used to create a map linking these ideas (Granjo, 2019). The three technologies discussed in this paper represent multiple SDGs including: No Poverty (SDG 1); Good Health & Well-Being (SDG 3); Decent Work & Economic Growth (SDG 8); Industry, Innovation & Infrastructure (SDG 9); Reduce Inequalities (SDG 10); Sustainable Cities & Communities (SDG 11); Responsible Consumption & Production (SDG 12); and Partnership for The Goals (SDG 17), (fig. 1 and 2). Figure 1 presents all the SDGs and how the three technologies interconnect within them. Figure 2 displays the SDGs (and associated technologies) in more detail and represents a more simplified map that facilitates an interpretation of the links between SDGs and technologies. Furthermore, it is also important to mention that the SDGs chosen for each technology were selected after careful examination and are presented according to a subjective interpretation by the author. Therefore, it remains open to further experimentation and in-depth revision.

Additionally, parallels are drawn between the three different stages of the Humanitarian Programme Cycle (HPC) — Preparedness, Response and Recovery (European Parliament, 2019) — and the three technologies that together form the core of this paper. Preparedness is correlated with the Artificial Intelligence Platform since the main priorities of this stage are assessment and analysis, strategic planning, and mobilisation. Response corresponds to Flying Labs because the first concerns here comprise the distribution of humanitarian services, as well as programme implementation and monitoring. Lastly, as Recovery concentrates on reconstruction and disaster risk reduction, this last stage coincides with the Smart Communities initiative that is mainly interested in facilitating greater resilience and providing more opportunities for crises victim (European Parliament, 2019, p. 10).

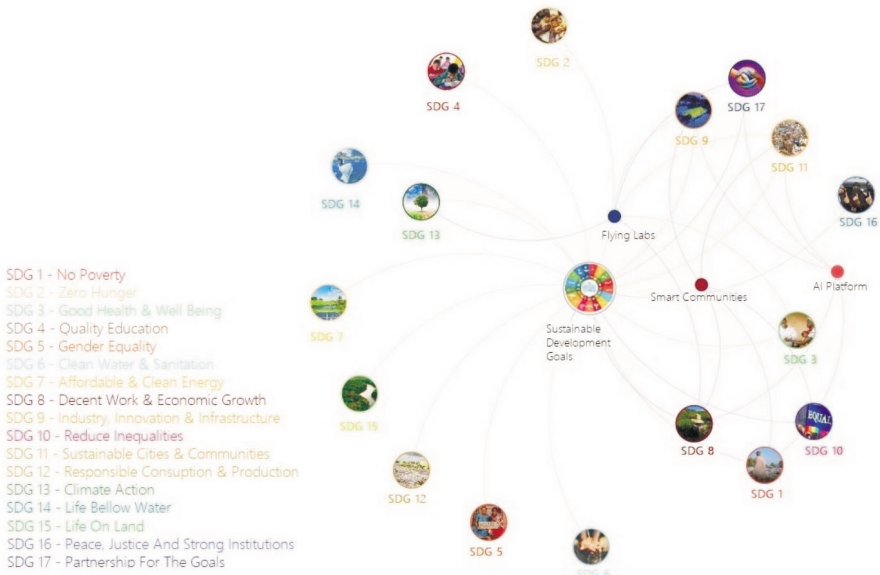


Figure 1 Map of the SDGs and the network the three technologies create



Figure 2 Flying Labs, AI platform and Smart Communities connecting with the SDGs

Artificial Intelligence (AI)

The humanitarian sector has been evolving at a rapid pace during the last decades through the implementation of technologies such as AI. According to John McCarthy, AI is "the science and engineering of making intelligent machines, especially intelligent computer programs" (2007). In other words, it is the creation of computerised machines and intelligent software. This is accomplished by studying the human brain and analysing how human beings learn, solve problems and make choices, so that from the results, intelligent software or algorithms may be developed and applied to many different tasks (McCarthy, 2007).

Many organizations across different sectors and regions are already using AI as part of their rescue equipment and for conflict prevention. According to the International Comity of the Red Cross (ICRC), there are distinct areas of interest for AI: its use in the conduct of warfare or in other situations of violence; and its use in humanitarian action to assist and protect the victims of armed conflict (2019). From AI-based facial recognition software for identifying missing persons to satellite imagery used to map population density in support of infrastructure-assistance projects, AI offers such a wide range of applications that are increasingly impossible to ignore (ICRC, 2019, p. 6).

Nevertheless, AI has many hurdles still to overcome. The fact that this technology facilitates a machine learning system and the autonomy of weapons inspires growing concern. Also, added to this is the worry that it may lead to new forms of cyber and information warfare (ICRC, 2019, p. 11). According to the ICRC these are legitimate concerns which can only be prevented in a human-centred approach - governments, militaries and other relevant actors in armed conflict must consider the necessity of human control that is both ethical and in compliance with international humanitarian law (ICRC, 2019).

AI For Humanitarian Action (HA)

AI for HA is an artificial intelligence platform that focuses on four aspects of HA: disaster response, refugees and displaced people, human rights, and needs of children. Microsoft has committed \$40 million on a new five-year program.

We are hopeful the world will see what a compelling force for good AI can be when it's used well in partnership with innovative NGOs. By ensuring technology fulfils its promise to address the broadest societal needs, we can empower everyone to achieve more.

A good example of AI for HA is the initiative arising from the partnership between the Humanitarian OpenStreetMap Team (HOT) and Microsoft. Due to the Ebola outbreak in late 2013 more than 28,600 cases of Ebola were reported in West Africa, with 11,325 of those being fatal (CDC, 2016). HOT used AI for satellite mapping to create a new generation of detailed and potentially *life-saving maps* that assist in the creation of preventative measures to contain the epidemic and localize the epicentres more effectively and efficiently. This is one of the few instances of harmonious cooperation between people and machines in a centre-based human approach (Fleming, 2020).

Another interesting point that technologies such as the AI platform demonstrate is that partnerships between the private sector (Microsoft) and the social sector (Humanitarian OpenStreetMap Team) can bring both monetary and creative incentives to HA. Firstly, the private sector not only donates but also encourages clients and the greater public to contribute to humanitarian campaigns (Mitchell, 2011). Secondly, it provides skilled personnel to assist in short-term and long-term emergencies. Another important consideration is that the local private sector often has the essential knowledge to assist humanitarian response teams and to rebuild the local economy in the aftermath of disasters (Humanitarian Leadership Academy, 2019, p. 4). If well implemented, these alternatives recently introduced into the humanitarian space have the

potential to change response efforts on the ground. With this aim in mind, the Connecting Business Initiative (CBI) was launched as a joint initiative between OCHA and UNDP during the World Humanitarian Summit in 2016. The aim was to further promote the engagement between the private sector, humanitarian assistance, and development and peace agendas (OCHA, 2019).

On the potential of AI for big data analysis, Zeid Ra'ad Al Hussein (UN High Commissioner for Human Rights) states,

We live in a rapidly evolving age, where technology can either be used to solve human rights problems or misused to erode human rights. Similarly, companies can infringe people's rights, or they can be a major progressive force (...) The private sector has an essential role to play in advancing human rights, and this partnership with Microsoft demonstrates how we can join forces in a constructive way.(2017)

As illustrated by the relatively recent advances of AI within humanitarian action, the ongoing developments and innovations in technology today promise a greater degree of computer consciousness and rationality. Any sensible next step in this field necessitates a more careful consideration of the moral responsibilities and duties surrounding artificial intelligence and robots. As the aforementioned examples demonstrate, all the elements are at our disposal; now all that is needed is to proceed with caution and prudence.

Community Empowerment and the use of drones (UAV)

Community empowerment develops when communities no longer bear the stigma of being merely the recipients of services and start exercising their rights and authority and gain recognition as equal partners in the planning, implementation, and monitoring of aid services. Community empowerment is a process that takes both time and effort. Mutual trust is required for people to feel respected and for this to happen they must be treated with dignity. Their concerns must be addressed and their involvement has to be a key element throughout the process of developing and implementing interventions (UNDP, 2016).

In some parts of the world, war, disease, famine, extreme poverty, and climate change may threaten human life and social organization at such a basic level that community development must emphasize helping people overcome those threats to stability. During extreme events, such as the coronavirus pandemic, community development might even focus on emergency relief for the unemployed, overworked health care workers, or food insecure folks in the community. (Thomson, 2020)

Resilience is the cornerstone of community empowerment since it is the capacity of people and systems *to cope with short-term disruptions and adapt to long-term changes without losing its essential character* (Lerch, 2017). The definitions of ‘community resilience’ and ‘community empowerment’ are interconnected and reciprocal — these terms essentially define one another and must be considered as part of the values inherent in a people-centred approach (Imperiale and Vanclay, 2016, p. 204-219). In the sphere of humanitarian assistance, resilience-oriented approaches are understood as being primarily focused on strategic planning to provide relief to communities and the already existing structures. It represents a shared aim towards which humanitarian actors, development actors, and local actors work simultaneously since it is an important factor in preventing critical emergencies and improving aid response (Guinote, 2019, p. 1051-1066).

Often, local people are the first responders in a crisis. Improving local conditions to empower communities is one of the key strategies that leads to effective long-term resilience. All throughout the recent history of humanitarian action technologies have been applied to further boost these aspects of community development. Nevertheless, it remains of the utmost importance that technologies be selected according to the specific context in which it is to function, and affordability and operability must be appropriated to the particular wants and needs of the local community (Sianipara et al, 2013).

There are some exemplary cases of context-specific uses of technology, such as that of drones in answer to the devastating destruction caused by the Super Typhoon Haiyan that hit the Philippines in 2013. Several NGOs on

the ground used unmanned aerial vehicles (UAV) to reduce the risks that rescuers frequently expose themselves to in emergency situations (Santos, 2013). Similarly, when massive floods in the Balkans collapsed local mines in 2014 (Meier, 2014) and an earthquake hit Nepal in 2015, rescue efforts were undertaken with fewer potential hazards to response teams (Ferris-Rotman, 2017). These instances demonstrate how not only did UAVs offer a key advantage in assessing affected areas, but they also accomplished it faster than the traditional methods ever could, which ultimately lead to lower death tolls (Santos, 2013). According to the 'Drones in Humanitarian Action' (2016) manual, the many uses of drones include: *Mapping; Delivering lightweight essential items to remote or hard to-access locations; Supporting damage assessments; Increasing situational awareness; Monitoring changes* (Soesilo et al, 2016, p.54)

To address the need for more effective disaster response, it is recommended that organizations build this capacity locally or regionally by including drones as an integral part of their emergency response toolkits (Soesilo, 2016). An interesting development is that along with the more common use of drones, UAVs are also being used by communities to address local needs from agriculture in Benin (Benin Flying Labs, 2020), to sexual health and reproductive rights in Ghana (Schiller, 2016), anti-poaching and reductions in wildlife crime in Kenya, Zimbabwe, and South Africa (Fieldstadt, 2015). Clearly, drones are being applied to dramatic effect to advance communities on the path towards empowerment and resilience.

Flying Labs

While the types of challenges vary from context to context, the thematic areas for humanitarian-development collaboration are often the same. Such as strengthening basic social services, durable solutions for displaced people and building resilience to climate-induced hazards (OCHA, 2019).

WeRobotics is an organization whose core objective is to empower local communities. As all disasters are place-specific and affect populations locally, they must be dealt with on a local level. Thus, the organization supports a global network of hubs to employ smart and local solutions. Given the fact that access to technology is not evenly distributed throughout the world, the provision of robotics technology has shown to be an important catalyst for social and economic resilience by providing equal opportunities and education. The organization offers training in the use of drones, robotics, data collection and analyses as well as AI. The goal is that, through education, communities develop new jobs and businesses with services in robotics. Community members are trained to use this technology and to both collect and analyse data to fulfil specific local needs — *‘from delivering lifesaving vaccines in rural settings, to large scale agriculture mapping, to increase yield for farming’* (WeRobotics, 2018).

Supported by WeRobotics, Flying Labs is a network of training hubs that teaches local communities how to operate drones to collect information for AI data analysis for various purposes. It is one of many technologies that provides tools for local development opportunities to third-world nations.

Flying Labs build local drones, data and AI skills through trainings they organise for local actors such as government services, not-for-profit organisations, research centres and universities. They also support these organisations in implementing their pilot projects and create replicable use cases for the humanitarian, health, environment, and development sectors (Flying Labs, 2018).

These hubs can be found across Asia, Africa and Latin America. In Panama and Tanzania robotics technology is used to locate resources, for mapping landscapes and hazardous areas, as well as in agriculture. Flying Lab in Tanzania teaches local youth to fly drones, collect data, and make maps for use in resource management, farming, urban planning, and disaster risk management (Tanzania Flying Labs, 2018). Panama’s hub has developed a

low-risk, cheap and efficient intelligent aid shuttle boat for transporting medical supplies to indigenous coastal communities in need. Similar to the project in Tanzania, drones in Panama are also operated to map large areas of land, however, they have also been adapted to identify mosquito breeding habitats in high tree canopies and to facilitate extermination in order to nullify local health risks (Panama Flying Labs, 2018). Projects such as these show how technology can encourage local empowerment and positive social impact through robotics, drone technology and education. The many possibilities for such applications are still to be explored and may still yield hitherto untapped opportunities for communities that would otherwise remain beyond reach.

Social Inclusion — Supporting refugees' living conditions

According to the report *Working together for local integration of migrants and refugees* launched by the OECD in 2018, it is becoming increasingly clear that to achieve social inclusion efforts must focus on local measures and they must be adaptable to the characteristics of both the host communities and the migrants themselves (OECD, 2018).

On the other hand, the society in which we live is often influenced by governments using discriminatory social measures through a generalist view of the *other*. These include political speeches that manipulate the moral feelings of the public while normalizing the suffering of others as somewhat volatile to their electoral agenda. But how is this *other* seen in an institutional landscape? (Fassin, 2012, p. 1-18). Malkki, in 'Speechless Emissaries' (1996), offered us a context through his experience in the field with refugee populations. His insight forces us to deconstruct the accepted notion of what social inclusion is and accept that frequently humanitarian institutions and their awareness campaigns tend to create mute victims by decontextualizing refugees and offering zero reference to their political, historical, or cultural backgrounds. The reality is that refugee communities are composed of individual people with individual tastes, beliefs, and needs (Malkki, 1996, p. 377-404).

I mean what's the difference between someone in Philly and somebody in a refugee city? We have to get away from the concept that, because you have that status — migrant, refugee, martian, alien, whatever — you're not allowed to be like everybody else. (...) when you arrive at a camp you have basically been stripped naked and lost everything that has to do with your identity. And in a camp, you are treated the same as everyone else, you are supposed to eat the same, drink the same, you get the same clothes. That's the humanitarian standard. (Kleinschmidt, 2015)

The average stay of an individual in a refugee camp is estimated at 17 years. The concept that refugee camps are temporary is a misleading one that permits systems to neglect long term solutions (Kleinschmidt, 2015). Within a camp, there is a formal system consisting of the protection offered by the institutions with their regulated aid services and relief packages, although, there is also an informal system or an "informal economy" which provides an infrastructure *"where refugees can buy the food they desire and consume it in cultural settings that reaffirm social and communal relationships"* (Oka, 2011, p. 225). According to Rahul Oka, it is the informal economy that offers refugees a sense of normality as well as being the major factor influencing well-being in camps despite all logistic shortcomings and political realities within the humanitarian context. Rahul Oka (2011) as well as Kilian Kleinschmidt (2015) defend that incentivising these informal systems is the key to a modern approach on encouraging a sense of comfort and settlement in these vulnerable communities.

Informal economies have been gaining traction in the last few decades by advocating "the use of cash or vouchers as an alternative or complementary means of increasing access to necessary commodities and services" (European Commission, 2013). In order to provide for these needs, the NGO CaLP was formed and, in partnership with the World Food Programme, co-founded the project Cash for Change. Such initiatives are proof of active support and capacity building by international institutions (European Commission, 2013). Often, cash transfer programmes are implemented as a means to combat fraud within organisations. Sometimes this leads to designs

that do not consider the needs of communities. This is illustrated by cash transfer programs that determine quantities and types of purchasable products, eventually resulting in market instability. It is necessary to take community members' necessities into account so that cash transfer programmes may function to their benefit (Sandvik, 2017).

These actions recognize that local markets and informal economies within refugee camps are a necessary prerequisite to the increasing demand for various commodities and services (such as hair salons, electronic products, restaurant, etc.) and that they hold the key to social inclusion (Kleinschmidt, 2015).

Smart Communities

In spite of the constraints they face, many refugee communities around the world are, in the words of one practitioner, 'doing it for themselves' when it comes to seeking solutions to their own economic challenges. (...) Recognizing and understanding this represents an opportunity to turn humanitarian challenges into sustainable opportunities. It has the potential to unlock ways to enable those economic systems to be channelled to the benefit of refugees, host states, and donors, as well as possibly offering a neglected opportunity for private sector entrepreneurship (Betts, 2014, p. 6-9).

Smart Communities is an initiative created by Mastercard and Western Union in partnership with UNHCR (United Nations High Commissioner for Refugees) that focuses on promoting self-reliance for refugees and host communities (Mastercard, 2017, p. 1-10). The project began by first analysing the social and financial contexts within the often permanent nature of refugee camps and displaced populations. As there are currently over 65 million displaced people around the world living in camps where the average period of habitation is 17 years, Smart Communities intends to provide for the growing needs of these refugees to achieve self-sufficiency and to serve as economic engines in their host countries (Kleinschmidt, 2015). This prototype can potentially assist in the establishment of much needed

economic resilience by providing a digital medium of exchange that is easily accessible and secure. Given the potential risks of cash transfers for both refugees and host communities, the use of digital wallets for affecting trade and remittances wherein refugees interact independently with local merchants through a mobile application has proven to be a far more secure and efficient manner of exchange. Furthermore, the model provides customers with other services, such as credit extensions, because merchants are already familiar with this technology and use it to run their businesses (Mastercard, 2017, p. 1-10).

This model, originally proposed by Mastercard-Western Union, provides a multi-dimensional solution as it encourages economically flexible structures and offers opportunities for an inclusive market that allows new businesses to be created on a local level. The models set up near the Kakuma and Kalobeyei camps in Kenya are a testament to its success. There it had been assumed that cash exchange was a satisfactory means of trade, however, research showed that refugees placed as high a value on the flexibility of using multiple tools to access goods and services as high-income populations do. Another advantage was that as both card-based and digital wallet technologies were already part of the toolkit available to both merchants and consumers, the community was provided with a means to save money (Oka, 2011). An added advantage is that this system works offline which allows agencies to easily monitor their programs. At its core, Smart Communities furnishes a digital infrastructure for marginalized populations while effectively using technology to deliver services with positive results for all associated parties (Mastercard, 2017, p. 1-10).

Discussion

The current paradigm of HA affords very little understanding on what it means to satisfactorily handle innovation, and as few resources and spaces have been made available to humanitarians, there is no

widespread agreement on the evaluation criteria to measure the successful use of innovation, nor is there any guidance given on how to achieve specific results. This makes it very challenging to judge what constitutes successful innovation in humanitarianism. In the ALNAP report in 2016, Alice Obrecht and Alexandra T. Warner defined humanitarian innovation as “an iterative process that identifies, adjusts and diffuses ideas for improving humanitarian action” (Obrecht and Warner, 2016, p. 16-24); and their methodology highlights three criteria that are essential to the successful application of technology in HA. Firstly, Adoption is the widespread acceptance “of an improved product, process, position or paradigm” and is considered the most desirable outcome of successful implementation; secondly, an Improved Solution is defined as that which “has viably improved current practices”; and finally, the criterion of Consolidated Learning and Evidence is only fulfilled when innovation is said to “contribute to the body of knowledge necessary for the humanitarian system to progress” (ibidem, p. 21).

However, this perspective still begs the question whether technology is truly leading HA to a better future since there is no solid evidence to which humanitarian actors may refer. On the other hand, some experts defend that technology and innovation are “an imposed concept” upon humanitarian action which enables self-renewal and relevance in this digital age (Scott-Smith, 2016; Sandkin, 2017).

Scott-Smith defines the current fascination with technology as ‘humanitarian neophilia’ as it “designates a distinctive approach to aid, which combines an optimistic faith in the possibilities of technology with a commitment to the expansion of markets” (Scott-Smith, 2016, p. 2). His main concern is that technology may come to replace the core standards of humanitarian action. This substitution of values, he defends, is due to the fact that the centralization of technology compounded with market solutions for aid are blurring the boundaries separating the aims of HA from business-oriented and state-oriented goals, which ultimately threatens the independence so essential to HA. Moreover, the introduction of business terminology to the HA

landscape changes the sector's sense of neutrality since *"it presents aid not as a gift but as a commodity, and in doing so it removes human relationships and power differentials from view"* (idem, p. 7). Seen from this perspective, relief organizations risk being viewed as 'suppliers of humanitarian goods', a sack of grain as 'humanitarian good', or even a hungry person as a 'consumer' (idem p. 8). These rising concerns are mostly attributed to the extensive inclusion of the private sector in relief missions. There must be a prioritization of what truly matters in the HA landscape for technology to function as a means of reaching those in need. In the same line of thought, Sandkin (2017) stresses that technology is not an end, but an effective means of action whose contributions must be based on the needs of those living in crisis situations. Keeping such considerations in mind allows for a more inclusive role of affected communities in the process of practically implementing technologies on the ground. Organizations need to find ways *"to strengthen open dialogue and commit to genuinely testing with rather than experimenting on communities"* (Batali et al, 2019). It is vital that the ethical implications of using technologies in humanitarian action remain a constant cause for reflection. A human-centred approach must be given the highest priority, thus *"AI and machine-learning systems remain tools that must be used to serve human actors, and augment human decision-makers, not replace them"* (ICRC, 2019, p. 12).

The humanitarian space is in a process of continual transformation thanks to modern technology, nevertheless, it is not owing to an increase in the latter that the results will improve. Instead, it is the intelligent application that affords the greatest returns (M. D. Cahill, 2004). All too often technologies frivolously exploited without a thought towards community sustainability only result in waste as the community is not shown how to integrate these tools in their daily lives (UNHCR, 2012). This situation is further compounded as the short-term emergency agendas of humanitarian activists rarely allows enough time for humanitarian agents to complete their training and instruct communities on how to use technologies effectively and in a context-specific way. An excellent example of

appropriate use is Panama's Flying Labs which shows that the potential exists for aid provision to remote communities that would otherwise remain undersupplied (Panama Flying Lab, 2018).

Several challenges remain to be tackled in this new technological approach to HA. One of the major concerns and weaknesses of using technology in humanitarianism is the risk of data theft. Information security can pose a great threat as insufficient funds delay the reinforcement of protection systems for vulnerable technologies. Furthermore, it is questionable whether spending on data protection is justifiable where it competes with the provision of aid and shelter. It must also be mentioned that an unequal playing field follows because powerful organisations, both private and public, command far greater capacity and financial backing to secure themselves in the cyber world (Sandvik et al, 2014). In this regard, Sandkin also defends that a "new protection obligation should be carried out" (Sandkin, 2017, p. 9). In her view, it is the role of humanitarian innovation to contribute to this process and that further research must be carried out on the subject.

Ultimately, the diffusion of technologies must be clearly articulated to furnish people with the tools that can enable them to choose their own future. Technology is a means, not an end, and the priority remains that of inclusion and digital education (Lee, 2020).

Women, people living in poverty, and rural communities often find themselves on the wrong side of a dangerous digital divide. Unless we are deliberate about empowering these already marginalised groups to participate in our increasingly digital economies, societies and political systems, new digital opportunities may only magnify inequality and exclusion. (Gates et al, 2018, p. 1-10)

It is not enough to characterize digital inclusion as access to computers and the internet, instead a more comprehensive definition embraces its role as an agent for capacity building, improved well-being, education, and economic resilience in every tier of society (SCOA, 2020). Therefore, investments in digital education as well as basic schooling must be considered an integral part of the solution. Catalysts for social exclusion such as

gender inequality, language barriers, poor education, or marginalized minorities lead to restrictive social norms and, consequently, need to be addressed with respect.

Conclusion

The aim of this paper has been to illustrate the advantages of technology in the humanitarian action landscape. Starting with the context surrounding HA and the principles of humanitarian action: humanity, neutrality, impartiality, and independence (Murphy and Ansari, 2018, p. 49-88) it went on to discuss the intricate web of actors and institutions in the field, from international organizations to local organizations and vulnerable communities. This includes a multilateral coordination involving institutions from the public sector, the social sector, and the private sector. There are many challenges that currently face the world and influence aid assistance: the shifting powers in the international arena where the United States is slowly losing its lead over China, and the Covid-19 pandemic which is fast corroding international relationships and deepening divisions between countries (Gould-Davis, 2020). Furthermore, there is a prominent fear of the “other”, and those who represent the most vulnerable communities are the ones who are the most affected. (Fasani & Mazza, 2020). Altogether these factors threaten the delicate sphere of HA and affects its ability to respond to the ever-present complexities of the modern world: global health crises, refugee crises, displaced people, gender inequality, poverty, hunger, inadequate sanitation, lack of universal access to education, and climate change. In answer to these issues global agendas such as the 2030 Agenda and major institutions such as the United Nations have consistently tried to renew the field of humanitarian action so that a more effective method to finding solutions to world crises may be developed. Since the beginning of the century, innovation has been increasingly considered a fundamental element of HA systems with the potential to positively impact its future. Nevertheless, transformation through technological innovation must involve a human-centred approach and must

employ “an iterative process that identifies, adjusts and diffuses ideas for improving humanitarian action” while at the same time taking affected communities into full consideration (Obrecht and Warner, 2016, p. 16-24). As demonstrated by the three technologies investigated in this paper, holistic applications of technology in HA already exist and have been shown to function well in the field. Microsoft’s AI platform suggests that it is possible for people and machines to work together in a centre-based human approach while achieving faster and more effective results in relief. Flying Labs illustrates how technology can bring innovation to the field, and that, when used inclusively, it can potentially create global equity which will benefit individuals as well as whole communities. Seen in its early stages of development Flying Labs may be considered low priority, however, in time it will come to be regarded as an essential tool in empowering populations. Lastly, Smart Cities confirms the viability of flexible infrastructures that create circular economies. In addition to their capacity for self-empowerment, neglected communities have often testified to the resilience of the people themselves. It has even been suggested that it is less important to offer aid services than it is to provide the tools that may enable them to emancipate themselves in both pre-disaster and post-disaster situations.

Many challenges still lie ahead, especially in contexts where a deep reflection on ethical implications is crucial to the responsible use of technologies on the ground, and further analysis is required on the approaches and adaptations institutions demonstrate as regards to technology. Putting people first is the central pivot upon which balances the altruism of aid and the misconception that modernization will lead to a better future in relief. Equilibrium may be maintained by adhering to principles that prioritise people above all else. Fundamentally, such guiding principles are now of vital significance if technology is to function without incurring the costs resulting from the disconnection between aid givers and affected communities, and instead act as a catalyst for increased cooperation among all sectors while still maintaining the true priorities of HA. Above all, the role of an aid worker is not of simply supplying goods and services, it is “listening to people’s needs,

running participatory appraisals, assessing success with qualitative means and responding to cultural peculiarities” (Scott-Smith, 2016, p. 7).

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