

Technologies of Peace

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Abstract and Keywords

This chapter examines the effects of the digital revolution and new information and communication technologies on peacekeeping and peacebuilding. The chapter is concerned with how digital and web-based information and communication technologies can be used to prevent and manage armed violence, foster inclusive societies, and ensure a durable and high-quality peace. The UN is increasingly adopting new technologies, particularly within the field of peacekeeping. To increase situational awareness, UN peacekeeping staff have crowdsourced information and used drones and satellite imagery. In addition, the analysis of peacekeeping data holds great potential for early warning. New technological tools can help foster collaboration, transform attitudes, and give a stronger voice to local communities. Online platforms have been used to monitor elections, document human rights abuses, and facilitate communication between members of different sides in a conflict. However, since one cannot simply assume that technology will change everything for the better, it is crucial to be aware of the ethical implications of the use of new peace technologies. The UN needs to be careful that early warning is translated into early action. Peacekeepers and peacebuilders should also be vigilant when it comes to mitigating the possible abuse and negative side effects of the use of peace technologies. The chapter concludes that peace technologies significantly influence the prospects for peacekeeping and peacebuilding, particularly when the use of technology helps peacekeepers and peacebuilders be more people-centric.

Keywords: technology, peacekeeping, peacebuilding, communication, data politics, drones

THE mass production and widespread use of the computer, smartphones, and the internet have dramatically changed our world. The digital revolution has particularly picked up pace in the twenty-first century. Hilbert and López (2011) estimate that in 2002, the worldwide digital storage capacity overtook the total analog information capacity for the first time. As of 2007 around 94% of the total amount of information was stored in digital form. Not only has the amount of available data grown, but the computing power to analyze these data has also grown exponentially: computing capacity has grown 58% per year between 1986 and 2007. More smartphones than non-smartphones were sold in de-

veloping countries in 2015 (Internet Society 2015, 17). It is estimated that half of the world's households (53.6%) in 2017 had access to the internet at home, compared with fewer than 20% in 2005 and just over 30% in 2010 (International Telecommunication Union 2017), and this figure is rising steadily. In short, we are living in the information age. This chapter examines the effects of the digital revolution and new information and communication technologies on peacekeeping and peacebuilding, focusing on how technology applications can prevent armed fighting, as well as foster inclusive societies and the peaceful resolution of conflicts.

We define peace technologies as mostly digital and web-based information and communication technologies used to prevent and manage armed violence and build a durable and high-quality peace (Sandvik et al. 2014, 220).¹ While the United Nations is arguably still lagging behind commercial industries and governments in terms of its adaption of new technologies, it is no longer a fair assessment to refer to the UN as a Remington typewriter in a smartphone world (Banbury 2016). In fact, the UN is increasingly adopting new technologies, particularly within the field of peacekeeping (Karlsruud 2014, 2017b; Dorn 2016). New technologies are also increasingly adapted within peacebuilding projects. New technological tools help people to foster collaboration, transform attitudes, and give a stronger voice to local communities (Larrauri and Kahl 2013).

This chapter outlines the current use of technologies aimed at peacekeeping and peacebuilding and reflects on the *possible use* of existing technologies that currently have not yet been implemented to help peacekeeping and peacebuilding efforts. Since (p. 415) one cannot simply assume that technology will change everything for the better, we also reflect upon several ethical implications of the use of new peace technologies. We conclude that peace technologies significantly influence the prospects for peacekeeping and peacebuilding, particularly when the use of technology helps peacekeepers and peacebuilders to be more people-centric. Yet the use of these technological advances are not without risk. Third parties using peace technologies should be vigilant when it comes to mitigating the possible abuse and negative side effects of the use of peace technologies.

Current Peace Technologies

Around the turn of the century, the UN began to adopt new technologies to support its peacekeeping missions. This trend was in response to a greater need to produce more efficient field intelligence to identify risks to peacekeepers and risks to achieving the mandate of peace missions. When he assumed office in 2011, the under-secretary-general for UN peacekeeping, Hervé Ladsous, embarked on a program of bringing “the UN into the 21st century” (Karlsruud 2017a, 51), adding controversial elements such as surveillance and an intelligence policy to the tools of UN peacekeeping operations. In 2014 Secretary-General Ban Ki-moon launched an expert panel on technology and innovation in peacekeeping, which advanced the idea in its report that besides being troop-contributing countries, UN members must also be technology-contributing countries (Dorn 2016; United Nations, 2014). The report of the High-Level Independent Panel on Peace Operations

published in 2015 also stressed the role of technology, concluding that the UN “must embrace innovation and the responsible use of technology to bridge the considerable gap between what is readily available to and appropriate for United Nations peace operations and what is actually in use in the field today” (UN General Assembly and Security Council 2015). In spite of this gap, the UN is increasingly improving its peacekeeping efforts through technological innovation.

A first major improvement of peacekeeping through technological innovation is the use of new communication technologies to get information from locals. Several UN peacekeeping missions have experimented with giving locals a place to which they can send observations and insights. This type of “participatory peacekeeping” by crowdsourcing information dramatically increases the situational awareness of the information analysts within a peacekeeping mission. The High-Level Panel reports that “[t]he best information [for peacekeepers] often comes from communities themselves. To use that information, missions must build relationships of trust with local people, leading to more effective delivery of protection of civilians mandates and better protection for peacekeepers” (UN General Assembly and Security Council 2015, paragraph 98). Dorn (2016, 1) succinctly summarizes this conclusion by pointing out that the UN’s ability to protect depends on its ability to connect with locals. An analysis based on UN data on Darfur conducted by Duursma (2017) seems to support this point, showing that local information can be used to predict where armed violence is going to occur (see (p. 416) also Duursma and Karlsrud 2019). In short, the crowdsourcing of information from locals may increase the situational awareness of peacekeepers.

Another area of technological innovation within the UN is the use of satellite imagery. To look at population movements many peacekeeping missions use Google Earth images with time intervals of one to three months, but some missions have adopted satellite imagery with much smaller time intervals (Dorn 2016). A telling example of how the use of near real-time satellite imagery can be useful is how the United Nations Mission in South Sudan (UNMISS) was able to use satellite imagery to issue an early warning about an impending attack. After the start of the civil war in South Sudan in 2013, geospatial analysts at UNMISS started to monitor a two-hundred-kilometer stretch of road between Juba and Bor. On 10 January 2014, a satellite image was taken that showed a convoy of twelve armored vehicles and three hundred soldiers heading toward Bor. Convergne and Snyder (2015, 571–572) note that given “the direction of the convoy, it was identified as potentially belonging to pro-government forces. Six hours elapsed between the time the image was taken and when its analysis was presented to decision makers at UN headquarters and in the mission.” This information subsequently allowed the UNMISS peacekeepers to take preventive action by taking up strategic positions and protecting pockets of civilians.

The use of drones is another form of remote surveillance that has been introduced in UN peacekeeping missions. The UN Security Council granted the UN Department of Peacekeeping Operations permission to use drones for the first time in 2013. This permission was granted in the context of the UN peacekeeping mission in the Democratic Republic of

the Congo (DRC) acquiring surveillance drones (Karlsruud and Rosén 2013; Dorn 2016). While this was the first time the Security Council endorsed the use of drones, the UN already had some experience with drones at this point. In 2006, for instance, the UN peacekeeping mission in the DRC was supported by a European force, in which a Belgian contingent brought drones with them. Another case involved the UN's inheriting drone capacity when a European force in eastern Chad was rehatted into a UN peacekeeping mission in 2009. Karlsruud and Rosén (2013, 2) explain that the use of drones in Chad "proved very useful to the mission, as UN forces could closely monitor the movement of the opposition forces and enhance the protection of refugees, IDPs [internally displaced persons], and humanitarian aid workers accordingly, thereby living up to the mandate of the mission." The situational awareness of peacekeepers has thus improved in those missions where these technologies have been implemented.

A lot of attention has been paid in the scholarly literature to how technology can help improve peacekeeping missions, but technological advances can also support peacebuilding processes. One of the most well-known examples in this regard is the use of the *Ushahidi* platform (<https://www.usahidi.com>). *Ushahidi*, which means "testimony" in Swahili, was a website set up to map incidents of violence in Kenya after the postelection fallout at the beginning of 2008. Though specifically developed for the Kenyan context, *Ushahidi* now acts as an open-source platform used to produce visual map information of a crisis based on data crowd-seeded in real time. The data can be provided via text messages, email, Twitter, and web forms. The *Ushahidi* platform has (p. 417) been widely used to monitor elections. The platform makes it possible to easily collect reports from thousands of volunteers on the ground across a country in which elections are held. This greatly helps in the detection of possible voter fraud, thus holding political parties accountable (Breuer and Welp 2014).

Mapping is also increasingly used to document human rights abuses (Mancini 2013). For example, the Voix des Kivus used SMS input from trusted reporters to document abuses in the eastern DRC (*Ushahidi* 2011). Similarly the Syria Tracker documents human rights violations via reports from the public (Humanitarian Tracker 2018). Indeed documenting human rights violations and the use of armed violence via local input is now commonplace. A major advantage of the early detection of armed violence is that it can trigger a timely response, for example in the form of community mediation (Bailey and Ngwenyama 2016; Tellidis and Kappler 2016).

The collection of data on human rights abuses is important because it can deter potential human rights violators and because it can inform policy and help peacekeepers and peacebuilders develop an effective response; it is also important in building a knowledge base for when the armed conflict has ended. When a war is over, documentation on human rights abuses and the experiences of victims can be helpful to truth and reconciliation committees (Miklian and Hoelscher 2018; Tellidis and Kappler 2016). Data on human rights are collected not only from local sources; geospatial technologies have also been used to for this purpose in countries like Sudan and Myanmar. "Geospatial technology" refers to a range of tools that help to conduct a spatial analysis of the Earth and human

geography (Bromley 2009). In the case of Sudan, Amnesty International used satellite imagery to document the destruction of villages. The ultimate goal of this project, called Eyes on Darfur, was to deter future attacks in this region (Bromley 2009; Levinger 2009).

While the majority of the data collection and analysis initiatives pertain to data on armed violence, some initiatives have also turned to the measurement of stability and development. For instance, UN Global Pulse has analyzed perceptions about food and fuel prices. Global Pulse is a flagship innovation initiative of the UN secretary-general to harness big data for humanitarian action. In a study conducted on Indonesia, Global Pulse (2014) showed that it is possible to mine tweets in order to measure Indonesians' perceptions of food prices in order to anticipate social unrest in relation to spikes in food prices. Indeed the analysis of big data can help peacebuilders understand changes in human well-being, which, in turn, helps to formulate a timely policy response.

Crucially the digital revolution has also made it easier to communicate across different countries and communities. This has strong implications for peacebuilding. Conflict often uses a certain discourse to legitimize violence (Lederach 2015; Galtung 1990). Peacebuilding is therefore about bringing opposing groups with divergent discourses together and creating a discourse conducive to peace (Larrauri and Kahl 2013, 15). The internet has greatly facilitated the ease with which different sides in a conflict can interact, as well as the ability for peacebuilders to reach a certain audience. Blogs and platforms such as Facebook and WhatsApp make it possible for people in sites of armed conflict to organize themselves, but also to engage with the views of the other side (Gallagher 2018; (p. 418) De Ville, Buckley, and Butler 2015; Salazar 2008). An initiative called the Peace Factory was launched in March 2012, when tensions between Israel and Iran were high, asking people to share positive messages from Israel to Iran and vice versa. The website soon also began posting messages from other pairs of countries in conflict. Some research is beginning to emerge that provides evidence of the effectiveness of initiatives like these. For instance, Martin-Shields and Stones (2014) find that the use of smartphones helped create social bonds between different ethnic groups in Kenya, contributing to more peaceful relations. More generally, they conclude that new communication technologies can facilitate "inter-group bridging" (6). However, the use of technology to improve peacebuilding efforts is still lagging behind the use of technology in the context of stabilization, statebuilding, crisis management, and humanitarian assistance. The next section therefore considers how technology can advance and complement existing peacebuilding efforts, as well as how it can improve peacekeeping practices.

The Best Has Yet to Come? Implementing New Peace Technologies

While peacekeepers and peacebuilders have started to implement an impressive array of new technological tools to support their work, there is still a lot of room for improvement. At least three major opportunities for how peace technologies can support peacebuilding can be recognized. First of all, peacebuilding organizations can use new technologies to

better facilitate exchange of information, while taking into account that some other parties might be interested in spreading false information to undermine the peacebuilding process or access information flows in order to target those who provide information. Peacebuilding has traditionally been a communication process largely based on face-to-face interaction between different sides of a conflict. New information and communication technologies can help close information gaps between parties by providing a lot of information to many people. For instance, in a Humanitarian Dialogue publication solely devoted to peacemaking and new technologies, Jenny et al. (2018, 14) note that “a shuttle diplomacy approach focused on passing factual information becomes less pertinent, as groups are less likely to be isolated and can easily access information online.” However, this also means that peacebuilders can no longer control the information flow—and some information that appears online might not be true. Indeed the misinformation and disinformation crisis that is accompanying the rise of social media greatly enhances the value of a third party that establishes confidence in the veracity of information (14). Peacebuilding organizations can act as independent organizations that verify information, providing all sides with confidence in the accuracy of certain pieces of information.

Second, peacebuilding organizations could tap into new technologies to allow for greater problem-solving to resolve conflicts, especially for society-wide problem-solving rather than elite-level problem-solving. Jenny et al. (2018, 15) write, “The archetypal model of a mediation as two political leaders from opposing groups sitting across (p. 419) a table with the mediator in the middle has never quite matched the complicated reality of multilevel and multi-track dialogue and consensus-building processes. It is likely to be even less reflective of reality in a future where power is diffused and ICT [information and communications technology] offers new platforms for engagement.” Online platforms could be utilized for engaging citizens in brainstorming and constructive consensus-building. This type of peacebuilding process has arguably much more potential to lead to an emancipatory peace than the elite-based problem-solving processes typically conducted as part of peacebuilding.

Third, and relatedly, new technologies make it possible for peacebuilders to inform the attitudes of not only elites but also entire societies. The analysis of big data has opened up the possibility of analyzing the psychological needs and attitudes of groups. Companies like Google and Facebook optimize algorithms based on big data for marketing purposes, but peacebuilding organizations could potentially alter algorithms to privilege conciliatory outcomes in social media exchanges. It would even be possible to develop “peace bots” that put the spotlight on conciliatory messaging while diminishing polarizing messaging (Build Up and MISTI 2018). In other words, peacebuilders now have possibilities for operating at a societal level to address emotions, shift conflict narratives, and perhaps even change hostile attitudes into more reconciliatory attitudes (Jenny et al. 2018, 16).

The room for improvement with regard to peacekeeping also seems significant. First of all, since geographic information system technology is becoming increasingly accurate, user-friendly, and less costly, the time seems ripe for the real-time tracking of UN peacekeepers (Karlsrud 2017b, 62–63; Dorn and Semken 2015). As Dorn and Semken (2015,

545) explain, this tracking can help “avoid and respond to ambushes, kidnappings and friendly fire incidents, rapidly send reinforcements and retrieve wounded peacekeepers, ultimately saving lives.”

In addition to adopting new technologies, the UN could improve the use of recently acquired technological tools like satellite imagery and drones. Drones represent a new way of seeing and knowing in peacekeeping. As such, they can improve “access to vulnerable populations, providing better information on potential threats to civilians, and increasing access to information in cases where the UN must use force to protect civilians” (Karlsruud and Rosén 2013, 3). While a conventional investigation patrol to a village several kilometers away from a UN peacekeeping base in difficult-to-travel areas like the DRC could take several hours, a drone could arrive in a matter of minutes to send high-quality images of the situation in real time (Karlsruud and Rosén 2013, 5; Dorn 2016, 7). However, the use of drones has not be without problems in UN settings. In Mali, for example, it took several months to get drones operational, as the UN inspectors tried to apply standard UN aviation regulations. A lack of spare parts and training of key personnel also initially prevented the UN from fully using its drone capacity in Mali (Van Dalen 2015, 313; Duursma 2018). Nevertheless the UN is moving in the right direction in terms of its use of drones, and it is likely that drones will soon be an indispensable part of UN peacekeeping missions.

With the increased use of new technologies, UN staff will have to process more and more data. Duursma (2018) explains that high volumes of information, especially when some of the information is contradictory, increases complexity and can thus actually (p. 420) undermine effective decision-making. Read, Taithe, and Mac Ginty (2016, 1314) note with regard to the increasing role played by data in the humanitarian sector that the enthusiasm for “data is vastly outstripped by the capacity to meaningfully analyse it.” In the context of UN peacekeeping Karlsruud (2017b, 72) states that a data deluge means that the major challenge for UN information analysts “will be to sift through rapid data streams, analyze them, and then produce actionable information in real-time.” The UN has already made a very important step in this regard with the development of the Situational Awareness Geospatial Enterprise (SAGE) event database tool. Developed at the UN Support Base in Valencia, Spain, this tool is a web-based database system that allows UN military, police, and civilians in UN peace operations (both UN peacekeeping operations and special political missions) to log incidents, events, and activities. SAGE includes not only incidents pertaining to armed violence but also troop movements, increased tensions, hijackings, abductions, protests, and many more potentially relevant incidents. Instead of just reporting free text, the information in SAGE is stored as structured data. This means that the event is categorized (type of event, number of victims, ethnicity, number and affiliation of perpetrators, geographical coordinates, and so on).

Over time, the gathering of structured data will enable mission leadership to identify trends and indicators for early warning. Consequently one of the most important new technologies the UN can harness is the use of machine learning to analyze SAGE and other structured data, which, in turn, will enable *predictive peacekeeping*. Duursma and

Karlsruud (2019, 1-2) define predictive peacekeeping as “a range of analytic tools and peacekeeping practices that serve to forecast where and when armed violence will take place, combined with changes in peacekeeping leadership decision-making, particularly deployment of peacekeeping staff, based on those forecasts.” Predictive peacekeeping could help UN staff in the field to anticipate rather than react to events unfolding. An actionable piece of information on where and when armed violence is likely to take place allows the leadership of a peacekeeping mission to take action. The flow of information within the UN system is often said to be mostly unidirectional: people in the field often complain about the lack of information coming from New York, the “black hole into which their reports descend” (Dorn 2010, 278). Predictive peacekeeping based on SAGE could ensure a two-way street of information, providing those in the field with early warnings based on the data they provide.

Risks and Pitfalls of Implementing Peace Technologies

New peace technologies should not do any harm to communities in countries that experience or recover from civil war. It is therefore important to consider the risks and pitfalls of implementing new peace technologies. Six major concerns stand out. First, even while new technologies make more effective early warning possible, this greater (p. 421) early warning capacity will need to be translated into more effective early action. Edward C. Luck (2010), the special advisor to Ban Ki-moon when he was an assistant secretary-general, pointed out in this regard that early warning is not an end in itself: “Early warning without early and effective action would only serve to reinforce stereotypes of UN fecklessness, of its penchant for words over deeds.” Indeed civilian populations will be left in harm’s way if early warnings are not acted upon (Duursma 2018; Duursma and Karlsruud 2019).

Second, the overreliance on new communication technologies can be at the expense of contextual knowledge of peacebuilders. Sandvik et al. (2014, 227) point out that the “humanitarian space” has shrunk in recent years, particularly in highly dangerous places like South Sudan and Syria (see also Fast 2014). In response, humanitarians, including peacebuilders, increasingly resort to communication tools like Skype for daily management or use SMS surveys rather than conduct those surveys themselves (Sandvik et al. 2014; Meier 2015). Duffield (2016) argues in this regard that a decrease in face-to-face engagements—due to the adoption of these new technologies—can lead to an erosion of ground truth. Indeed there is a limit to the extent to which information can be transferred via SMS or Skype. As a result, relying on these type of technologies can be detrimental to the effectiveness of peacekeeping and peacebuilding, as it further widens the already existing gap between assessments by locals and assessments by peacekeepers and peacebuilders (Read 2016; Müller and Bashar 2017). In other words, peace technologies should help peacekeepers and peacebuilders to be better informed and thus more connected to the

communities with whom they work (see Karlsrud 2014), and at the same time peacekeepers and peacebuilders should continue to engage in face-to-face interactions with locals.

Third, and somewhat relatedly, practitioners should be aware of the potential unequal effects of peace technologies. Larrauri and Kahl (2013, 2) refer to this as the “bias of connectivity.” Some groups may be more able than other groups to use a given technology. For instance, smartphones are used more often by young, urban, and relatively wealthy people (2). In addition, the technology gap between men and women is much more pronounced in low-income countries (Sandvik et al. 2014, 229). This means that those organizations that solely rely on new technologies to extract information will likely develop policies that are skewed toward those locals who are connected. For example, Mansfield (2015) shows that data collected in Afghanistan is generally biased toward areas that are relatively secure and that offer little risk to those conducting surveys. Moreover surveys in Afghanistan have typically excluded populations living in remote areas. These are not trivial issues resulting in some missing data points but can result in surveys suggesting that the need for peacebuilding activities is greatest in relatively secure areas where international investment is higher and the population is more attuned to the interests of the state. Indeed the population in remote parts of a country typically has a much more negative perception of the government and international peacebuilding efforts (Mansfield 2015, 112). Hence one important precautionary measure peacebuilding organizations could take to mitigate the undesired effects of technology is to not solely rely on quantitative data generated through surveys to guide their efforts. Existing data (p. 422) collection techniques need to be supplemented with geospatial analysis and mapping in order to determine where data are collected and where not, combined with well-focused fieldwork to generate information on remote and dangerous areas.

Fourth, a fundamental aspect of the use of peace technologies is the storage of sensitive data, which could fall into the wrong hands. Sharing sensitive information over a particular technology always entails risks (Larrauri and Kahl 2013, 2). The UN has already become the target of cyber-attacks in Libya and Geneva (Scott-Railton 2013; Parker 2020). Attacks could aim to retrieve data or even change data to alter the understanding of the reality on the ground. Peace practitioners must therefore continuously check whether the technology they are using is secure, as well as decide where the data will be stored, how to keep the data secure, and how long the data should be stored (Karlsrud 2017b, 75). Exchanges of information over the internet and over mobile phones are relatively easy to check. Hence peacekeepers and peacebuilders who use these means of communication have a responsibility to make sure the systems are secure and private, as well inform the end users of their products that no communication system can be completely secure. A telling example in this regard is the confidential relationship UN information analysts have with local informants. Because information from local informants might reveal their identity, the consequences of this type of information falling into the wrong hands could be catastrophic. Indeed al-Qaeda in the Islamic Maghreb has circulated death lists with alleged local informants of the UN peacekeeping mission in Mali (Duursma 2018). Similarly informants in the DRC, who were previously provided with mobile phones to alert

UN peacekeepers of imminent violence, are known to have been targeted in retaliation (Karlsruud 2017b, 64).

Jacobsen (2017, 530) has discussed how the UN High Commissioner for Refugees has put into use biometric technologies (mainly fingerprinting and iris scanning) “as a ‘routine feature’ ” in the registration of refugees. These data are gathered to provide assistance “in a better and more efficient way” (OCHA 2013, in Jacobsen 2017, 537), “which in turn has rendered new domains of refugee existence accessible and open to intervention,” Jacobsen argues (540). As may be expected, host states such as Kenya and Lebanon have demanded access to these data, and refugees have expressed strong reservations about biometric registration if these data are to be shared with host states. Also, donor states are keenly interested in such data, and in the context of refugees from conflict countries that are part of the ongoing war on terror there is a palpable risk that this interest may be motivated as much by national security concerns as by protecting refugees’ rights (539).

Fifth, the advance of new technologies could potentially prolong the existing interventionary order. Existing interventions embedded in self-interest and geopolitical domination are often seen as a root cause of many international and domestic conflicts. The availability of new technologies like battle drones can already be seen as co-opted by states that want to pursue their interests remotely (Williams 2013). During the past decade, the strategic focus of Western countries has moved from large-scale interventions to counterterrorism and “targeted strikes,” structurally enabled by the confluence of drone technology, data convergence, and machine learning technologies (Karlsruud 2019; Lindsay 2013). At the same time, new technological advances have the (p. 423) potential to tame these types of interventions. For instance, the collection of data by the Bureau of Investigative Journalism on US drone warfare in Pakistan, Afghanistan, Yemen, and Somalia leads to greater transparency on targeted killing and potentially holds the White House to account. Moreover, new peace technologies can make interventions more people-oriented. Research on peace formation has shown that the prospects for emancipatory peace commonly have not come from external actors, ethnonationalist elites, or critical resistance movements, but from local and everyday acts of peace and agnostic forms for reconciliation (Visoka 2017). Third parties can facilitate this type of peace formation by promoting intercultural awareness and constructive consensus-building over destructive polarization (Jenny et al. 2018).

Sixth, the use of peace technologies can have unintended consequences that peacekeepers and peacebuilders should try to anticipate and mitigate (Miklian and Hoelscher 2018). Public posts on platforms like Facebook played a central role in the formation of democracy movements in the Arab Spring, but the Syrian and the Egyptian governments have used information collected from these platforms to track down and punish activists (Miklian and Hoelscher, 2018; Comninos 2013). Another possible unintended consequence of adopting technological advances is that it can lead to passivism among those working to build peace (Chandler 2016). Larrauri and Kahl (2013, 2) note that in the context of peacebuilding “sending in information but receiving no feedback, clicking a ‘like’ button

but not changing attitudes, discussing an issue online but failing to take action offline” are all examples of passivity resulting from the use of peace technologies. The use of drones in peacekeeping missions has also been reported to have unintended consequences. In eastern DRC, the local population refers to drones as “loud mosquitos,” indicating that people see the drones as an unwanted annoyance rather than a crucial tool to help protect them (Karlsruud 2017b, 75). Worse than merely an annoyance, the use of drones in UN peacekeeping missions could also raise expectations. Accordingly, drones must be accompanied by effective public awareness campaigns. Locals need to know why drones are used but also need to be made aware of what the drones’ limits are.

Finally, one of the most shocking unintended consequences of the use of a peace technology is how Amnesty International’s Eyes on Darfur project tragically backfired. Amnesty International hoped to deter attacks on villages in Darfur using satellite imagery (Levinger 2009). However, a quantitative assessment of the Eyes on Darfur project shows that villages that were monitored actually became more likely to be attacked. This suggests that the government of Sudan increased violence to retaliate against the monitoring and advocacy efforts of Amnesty International (Grant 2015).

Conclusion

We are living in the information age, and the digital revolution has influenced peacekeeping and peacebuilding efforts. Several UN peacekeeping missions use mobile (p. 424) phone technology to collect early warnings from local populations, as well as drones and satellite imagery to enhance situational awareness. Peacebuilding organizations use new technologies to collect information to prevent voter fraud, for early warning, to determine where to conduct community mediation, to deter potential human rights abuses, to hold accountable human rights abusers, and to collect information that could be used by truth and reconciliation councils when a war has ended. While the UN has made some big steps in terms of the technologies it has adopted, there is room for making more use of available technologies. Drones and satellite imagery are now used in some missions, but they could be adopted in more and could play a more central role in those missions that use them. Crucially the UN will need to find a way to analyze the enormous amount of data it produces every day. Machine learning to detect patterns in these data and produce early warnings holds great promise in this regard.

However, the use of new peace technologies is not without risk. Collected data can fall in the wrong hands. In addition, some have expressed concerns about the use of technologies being at the expense of face-to-face engagements, ultimately resulting in peacekeeping and peacebuilding efforts that are divorced from realities on the ground. While this is a real concern and peacekeepers and peacebuilders should try to avoid this, the use of new technologies also has the potential to make peacekeeping and peacebuilding more people-centric. Indeed the crowdsourcing of information for peacekeeping and peacebuilding is much more bottom-up than traditional practices.

In conclusion, technological advances provide new avenues to develop effective mediation, peacekeeping and peacebuilding practices. The use of peace technologies is particularly helpful when it contributes to the activities of peacekeepers and peacebuilders being more people-centric and helps to make the transition from effective analysis to effective action.

References

- Bailey, A., and O. Ngwenyama. 2016. "Community Bridging through ICTs: Seeking to Overcome Digital and Community Divides." *Journal of Community Informatics* 12:69–89.
- Banbury, A. 2016. "I Love the U.N., but It IS Failing." *New York Times*, 18 March.
- Breuer, A., and Y. Welp. 2014. *Digital Technologies for Democratic Governance in Latin America*. London: Routledge.
- Bromley, L. 2009. "Eye in the Sky: Monitoring Human Rights Abuses Using Geospatial Technology." *Georgetown Journal of International Affairs* 10:159–168.
- Build Up and MISTI. 2018. "The Commons: A Pilot Methodology for Addressing Polarization Online." <https://milunesco.unaoc.org/mil-resources/the-commons-a-pilot-methodology-for-addressing-polarization-online/>.
- (p. 425) Chandler, D. 2016. "How the World Stopped Worrying and Learned to Love Failure: Big Data, Resilience and Emergent Causality." *Millennium* 44:391–410.
- Comminos, A. 2013. *The Role of Social Media and User-Generated Content in Post-conflict Peacebuilding*. Washington, DC: World Bank.
- Convergne, E., and M. R. Snyder. 2015. "Making Maps to Make Peace: Geospatial Technology as a Tool for UN Peacekeeping." *International Peacekeeping* 22:565–586.
- De Ville, G., A. A. Buckley, and B. Butler. 2015. "Pantanî Blog: Using ICT for Safeguarding and Sharing Indigenous Social Memory." *Journal of Research and Didactics in Geography* 2:97–102.
- Dorn, A. W. 2010. "United Nations Peacekeeping Intelligence." In *The Oxford Handbook of National Security Intelligence*, edited by L. K. Johnson, 275–295. Oxford: Oxford University Press.
- Dorn, A. W. 2016. *Smart Peacekeeping: Toward Tech-Enabled UN Operations*. [Report] New York: International Peace Institute.
- Dorn, A. W., and C. Semken. 2015. "Blue Mission Tracking: Real-Time Location of UN Peacekeepers." *International Peacekeeping* 22:545–564.
- Duffield, M. 2016. "The Resilience of the Ruins: Towards a Critique of Digital Humanitarianism." *Resilience* 4:147–165.

Duursma, A. 2017. "Counting Deaths While Keeping Peace: An Assessment of the JMAC's Field Information and Analysis Capacity in Darfur." *International Peacekeeping* 24:1-25.

Duursma, A. 2018. "Information Processing Challenges in Peacekeeping Operations: A Case Study on Peacekeeping Information Collection Efforts in Mali." *International Peacekeeping* 25:446-468.

Duursma, A., and J. Karlsrud. 2019. "Predictive Peacekeeping: Strengthening Predictive Analysis in UN Peace Operations." *Stability: International Journal of Security & Development* 8:1-19.

Fast, L. 2014. *Aid in Danger: The Perils and Promise of Humanitarianism*. Philadelphia: University of Pennsylvania Press.

Gallagher, A. 2018. *How "Peace Tech" Is Changing Global Conflict*. Washington, DC: US Institute of Peace.

Galtung, J. 1990. "Cultural Violence.:" *Journal of Peace Research* 27:291-305.

Global Pulse. 2014. *Mining Indonesian Tweets to Understand Food Price Crises*. UN Global Pulse Methods Paper. Jakarta: UN Global Pulse.

Grant, G. 2015. "Monitoring Conflict to Reduce Violence: Evidence from a Satellite Intervention in Darfur." Unpublished paper. http://cega.berkeley.edu/assets/miscellaneous_files/Gordon_Monitoring_Conflight_to_Reduce_Violence_WGAPE.pdf.

Hilbert, M., and P. López. 2011. "The World's Technological Capacity to Store, Communicate, and Compute Information." *Science* 332:60-65.

Humanitarian Tracker. 2018. "Syria Tracker." <https://www.humanitariantracker.org/syria-tracker>.

International Telecommunication Union. 2017. "Measuring the Information Society Report." Geneva: International Telecommunication Union.

Internet Society. 2015. *Internet Society Global Internet Report 2015: Mobile Evolution and Development of the Internet*. Washington D.C.: Internet Society.

Jacobsen, K. L. 2017. "On Humanitarian Refugee Biometrics and New Forms of Intervention." *Journal of Intervention and Statebuilding* 11:529-551.

Jenny, J., R. Greenberg, V. Lowney, and G. Banim. 2018. *Peacemaking and New Technologies: Dilemmas and Options for Mediators*. Geneva: Centre for Humanitarian Dialogue.

(p. 426) Karlsrud, J. 2014. "Peacekeeping 4.0: Harnessing the Potential of Big Data, Social Media and Cyber Technology." In *Cyber Space and International Relations: Theory, Prospects and Challenges*, edited by J. F. Kremer and B. Müller, 141-160. Berlin: Springer.

- Karlsrud, J. 2017a. "Towards UN Counter-terrorism Operations?" *Third World Quarterly* 38:1215–1231.
- Karlsrud, J. 2017b. *The UN at War: Peace Operations in a New Era*. Basingstoke: Palgrave Macmillan.
- Karlsrud, J. 2019. "From Liberal Peacebuilding to Stabilization and Counter-terrorism." *International Peacekeeping* 26:1–21.
- Karlsrud, J., and F. Rosén. 2013. "In the Eye of the Beholder? UN and the Use of Drones to Protect Civilians." *Stability: International Journal of Security and Development* 2:1–10.
- Larrauri, H. P., and A. Kahl. 2013. "Technology for Peacebuilding." *Stability: International Journal of Security and Development* 2:1–15.
- Lederach, J. 2015. *Little Book of Conflict Transformation: Clear Articulation of the Guiding Principles by a Pioneer in the Field*. Intercourse, PA: Good Books.
- Levinger, M. 2009. "Geographical Information Systems Technology as a Tool for Genocide Prevention: The Case of Darfur." *Space and Polity* 13:69–76.
- Lindsay, J. R. 2013. "Reinventing the Revolution: Technological Visions, Counterinsurgent Criticism, and the Rise of Special Operations." *Journal of Strategic Studies* 36:422–453.
- Luck, E. C. 2010. "Statement by Edward C. Luck Special Adviser to the United Nations Secretary-General: Informal Interactive Dialogue on Early Warning, Assessment, and the Responsibility to Protect." United Nations General Assembly, 9 August.
- Mancini, F. 2013. *New Technology and the Prevention of Violence and Conflict*. New York: International Peace Institute.
- Mansfield, D. 2015. *Effective Monitoring and Evaluation in Conflict-Affected Environments*. Washington, DC: US Institute of Peace.
- Martin-Shields, C., and E. Stones. 2014. "Smart Phones and Social Bonds: Communication Technology and Inter-Ethnic Cooperation in Kenya." *Journal of Peacebuilding & Development* 9:50–64.
- Meier, P. 2015. *Digital Humanitarians: How Big Data Is Changing the Face of Humanitarian Response*. Boca Raton, FL: CRC Press.
- Miklian, J., and K. Hoelscher. 2018. "A New Research Approach for Peace Innovation." *Innovation and Development* 8:189–207.
- Müller, T. R., and Z. Bashar. 2017. "'UNAMID Is Just Like Clouds in Summer, They Never Rain': Local Perceptions of Conflict and the Effectiveness of UN Peacekeeping Missions." *International Peacekeeping* 24:756–779.

Parker, B. 2020. "EXCLUSIVE: The cyber attack the UN tried to keep under wraps." *The New Humanitarian*, 29 January.

Read, R. 2016. "Tensions in UN Information Management: Security, Data and Human Rights Monitoring in Darfur, Sudan." *Journal of Human Rights Practice* 8:101–115.

Read, R., B. Taithe, and R. Mac Ginty. 2016. "Data Hubris? Humanitarian Information Systems and the Mirage of Technology." *Third World Quarterly* 37:1314–1331.

Salazar, J. F. 2008. "Indigenous Peoples and the Cultural Constructions of Information and Communication Technology (ICT) in Latin America." In *Information Communication Technologies: Concepts, Methodologies, Tools, and Applications*, edited by C. van Slyke, 1966–1975. Hershey, PA: IGI Global.

Sandvik, K. B., M. Gabrielsen Jumbert, J. Karlsrud and Mareile Kaufman. 2014. "Humanitarian Technology: A Critical Research Agenda." *International Review of the Red Cross* 96:219–242.

(p. 427) Scott-Railton, J. 2013. *Revolutionary Risks: Cyber Technology and Threats in the 2011 Libyan Revolution*. Newport, RI: Center on Irregular Warfare and Armed Groups, US Naval War College.

Tellidis, I., and S. Kappler. 2016. "ICT in Peacebuilding: Implications, Opportunities and Challenges." *Cooperation and Conflict* 51:75–93.

United Nations. 2014. *Performance Peacekeeping: Final Report of the Expert Panel on Technology and Innovation in UN Peacekeeping*. New York: United Nations.

UN General Assembly and Security Council. 2015. *Report of the High-Level Independent Panel on Peace Operations on Uniting Our Strengths for Peace: Politics, Partnership and People*. 17 June. <file:///C:/Users/user/Downloads/2015-UNGA-HIPPO-Report.pdf>.

Ushahidi. 2011. "Voix des Kivus: A Crowd-Seeding System in DRC." 16 May. <https://www.ushahidi.com/blog/2011/05/16/voix-des-kivus-a-crowd-seeding-system-in-drc/>.

Van Dalen, J. A. 2015. "ASIFU: Baanbrekend Inlichtingenexperiment in Mali." *Militaire Spectator*, 7 August.

Visoka, G. 2017. *Shaping Peace in Kosovo: The Politics of Peacebuilding and Statehood*. Basingstoke, UK: Palgrave Macmillan.

Williams, B. G. 2013. *Predators: The CIA's Drone War on al Qaeda*. Washington, DC: Potomac Books. (p. 428)

Notes:

(1.) For an overview of other technological tools that we could not cover in this chapter due to limited space, see, e.g., Dorn (2016) and United Nations (2014).

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