



PeaceTech: Digital Transformation to End Wars

Second Edition

Christine Bell



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“Bell covers an impressive breadth of empirical ground, and her personal experience of working on the PeaceFem app and the PA-X Peace Agreement Database provides important lessons on using digital innovation in academic research and peacebuilding.”

—Fabian Hofmann, *AI for peace, International Affairs, Volume 101, Issue 2, March 2025, Pages 727–729, at 729*, <https://doi.org/10.1093/ia/iiaf047>

“Christine Bell offers an in-depth thought-provoking look at a complex topic. These are conversations that we need to have - to challenge the arms-race mentality that a bad person with a weapon can only be defeated by a good person with a bigger weapon. The answer is not clear or simple, but we owe it to ourselves and our children to seek a better way.”

—John Kelly, *PhD, Data Analyst, AI entrepreneur, and Ultrarunner*

“In PeaceTech, Bell offers a timely and thoughtful account of how digital tools, including generative AI, are already reshaping peacebuilding. Steering between hype and despair, she shows how AI can strengthen listening, improve analysis, and support translation and negotiation, all without displacing the human judgment, agency, and conflict sensitivity this work demands.”

—Emily Laird, *Generative AI 101 Podcast, AI Integrationist, University of Wisconsin*

“Like so many other sectors, peacebuilding is experiencing disruption and opportunities as a result of the digital revolution. Christine Bell’s magnificently accessible book walks us through PeaceTech. The book steers a wise path between digital optimism and pessimism and concludes with a call for how technology can work more effectively for peace. Highly recommended.”

—Roger Mac Ginty, *Professor in Defence, Development and Diplomacy, Durham University*

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Christine Bell

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ABOUT THIS BOOK

Why are we willing to believe that technology can bring about war... but not peace?

PeaceTech: Digital Transformation to End Wars is a foundational book dealing with digital innovation to support peace and transition processes. Through an interwoven narrative of personal stories that capture the complexity of real-time peace negotiations, Bell maps the fast-paced developments of PeaceTech, and the ethical and practical challenges involved. This second edition captures the rapid changes in conflict, mediation and technology that have gathered pace in the short time since the book was first published in early 2024. Notably these include conflict and mediation fragmentation, and the arrival of new forms of Gen-AI.

Bell locates PeaceTech within the wider digital revolution that is also transforming the conduct of war. She lays bare the ‘double disruption’ of peace processes, through digital transformation, and through changing conflict patterns that make negotiated ends to conflict more difficult to achieve. Against this backdrop—can digital peacebuilding be a force for good? Or do the risks outweigh the benefits?

With new chapters on PeaceTech ‘praxis’, artificial intelligence, and the challenges of generative artificial intelligence, the book provides both conceptual analysis of how peacebuilding is changing and practical information for PeaceTech entrepreneurs.

PeaceTech ends with a provocation in the form of a 12-Step Manifesto focused on successful use of digital tools to support peace processes and end wars.

This open-access book will be invaluable primer for business tech entrepreneurs, peacebuilders, the tech community, and students of international relations, informatics, comparative politics, ethics, and law; and for those simply curious about peace process innovation in the contemporary world.

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She is also a distinguished peace process mediator and PeaceTech innovator renowned for her transformative role in global mediation and transition processes. She has over thirty years of experience in conflict mediation and constitution-drafting including with the United Nations and has advised on international legal and constitutional matters relating to mediation strategies and processes in varied contexts, including in Colombia, Israel/Palestine, Northern Ireland, Bougainville/Papua New Guinea, Sri Lanka, and Ukraine.

Christine grew up in and during the conflict in Belfast, Northern Ireland, and obtained a First Class law degree at Selwyn College Cambridge, followed by an LLM at Harvard Law School. She qualified and worked as a barrister in Northern Ireland and an attorney-at-law in New York and has recently gained qualifications in digital transformation and artificial intelligence at Imperial College London. Her academic work on peace processes has won the Francis Deak Prize of the American Association of International Law and the Hart Socio-Legal Book Prize.

The book draws on Christine's work as part of the cross-disciplinary PA-X Peace Analytics team, University of Edinburgh, Queen's University of Belfast and St Andrews (see www.peaceagreements.org). This work has pioneered innovative 'peace analytics' data on peace processes. This data has been used by the PA-X team to provide in-time evidence-based support to the mediation, design, and implementation of peace and transition processes globally, with a focus on inclusion.

PA-X has supported local communities and international organizations working in the most complex contemporary conflicts including in: Afghanistan, Ethiopia, Iraq, Myanmar, Somalia, South Sudan, Sudan, Syria, Yemen, and Ukraine. In 2023 the PeaceRep team won the Royal Society of Edinburgh's prestigious Mary Somerville Prize for excellence in team research, in recognition of its work relating to digital support for peace processes.

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CHAPTER 1

PeaceTech World

Abstract The PeaceTech world described in this book is a racy, developing, and exciting one. It harnesses peacebuilders, digital technology entrepreneurs, and often local communities of activists, in pursuit of peace-focused innovation and influence. Their aim? To promote more peaceful relationships, structures, and fairer outcomes, and so prevent, de-escalate, and resolve conflict. This chapter introduces PeaceTech World.

Keywords PeaceTech · United Nations

1.1 PEACE TECH IN ACTION

1.1.1 *Seán*

Seán sits in his air-conditioned office in the capital city of a very hot country with a ‘peace process’. He works for the United Nations (UN) (UN, 2025a). His job involves deciding how to spend funds pooled by countries cooperating to support the peace process. He uses this money to support local peacebuilding projects in an attempt to reinforce the peace process by addressing local conflicts that might undermine it. There is one problem: the peace process is not much in evidence. There was a peace agreement many years ago. Then a revised one when the first did not work. Then more revisions. Each agreement tried to make the preceding

one work by amending it or adding new ‘implementation matrixes’ and new timelines. Despite these efforts, the ‘peace process’ barely exists.

Seán works and lives in the country. Except for the one week in six that he gets off, which he uses to go home or recuperate in tourist spots in neighbouring countries. As an ‘international’ he works in a building in a ‘compound’, a gated community where lots of the diplomatic embassies and international offices are located behind the same perimeter fence. Seán’s credentials as an international mean he cannot leave the compound easily—it is considered too unsafe. He does not just work in the compound but also lives in its residential section. His world exists between home and work buildings and in the cafes and coffee shops around them. Except for a few days every two months, when the team visits projects ‘out there’ in the countryside. His home life is through his screen. He does not like things being the way they are.

Seán’s job involves monitoring and reporting on how all the funded projects are going. He compiles a lot of project reports and data relating to the country. He spends huge amounts of time gathering data and cutting and pasting it into his reports. It’s much more boring than what his family thinks he does. He tries to use this information to show the donors how their money is spent and what it is achieving. It takes forever, so he and his colleagues are working on an automated system to try to capture the data and decrease the manual work. They hope that new generative artificial intelligence (Gen-AI) tools may help them to do this work faster in the future, but so far no-one is allowed to use them on United Nations computers due to data security concerns. Although AI has not been sanctioned by his bosses, sometimes Seán uses his own ChatGPT account to streamline his report drafting, and online translation tools to get a sense of national language policy documents.

1.1.2 *Conall*

Sitting in Geneva, Conall works on this same country, and sort of for the UN. He works to deliver food aid to places where people are going hungry. Many of those places are in countries experiencing armed conflict. Today he gathers international experts online. The organization he works for has just won a major award for peace, even though it exists to deliver food aid. Now his boss has questioned, if people think that food and peace are connected and have given us a prize for peace, should the organization try to measure the ‘peace impacts’ of its food aid?

When does food aid build peace and when might it have a negative peace impact? His boss has asked Conall to help design a dashboard to help measure peace impacts or to warn of war impacts of food aid programmes. Sometimes those in the organization have been aware that food programmes, for example offering incentives to increase milk production, are co-opted by armed groups for income or trigger cattle rustling between warring communities. The dashboard aims to help the organization think more systematically about how proposed delivery of food aid might cause conflict or have peace impacts.

When we say that Conall ‘sort of’ works for the UN, what does that mean? He works for an agency within the United Nations that operates almost as an independent organization within the UN’s broad umbrella (see Foley, 2023, p. 4). While in some deep sense Seán and Conall work for the same organization, in another sense they do not. The UN agencies they work for operate as autonomous organizations and will not ask Seán and Conall to work together. Each agency will not trust the other enough to share data or allow staff to cooperate freely. Trust cannot exist across agencies, as much of the data is sensitive to the specific job each agency does, for data privacy or diplomatic reasons. For example, each organization’s conflict analysis will contain views of particular armed groups, or state armies or their leadership, but can cause a diplomatic incident if it becomes public and is seen as the formal or even informal position of the agency or the United Nations in general. Sometimes information has to be kept tightly confidential because it could be helpful to ‘war tech’. Information on networks of civic groups, for example, can be used to target activists and must be kept secure.

Seán and Conall may never learn of each other, and their projects will be restricted to those ‘who need to know’ within their own agency or department. If they do meet in ‘shows and tells’, they will never be asked to collaborate and will not be allowed to access the other’s finished data system. Could it not be a different way, they wonder?

1.1.3 *Atem and Warren*

Out beyond the capital city, Atem, who is from the country Seán and Conall are working on, works as part of a Churches project trying to support local agreements to end conflict arising from cattle theft and kidnapping of people. He gets money from Seán’s fund. The conflict with which Atem is engaged is between local communities and armed

groups. But it has curious links to the ‘national conflict’. For example, there is overlap between local armed groups and political leaders and the main armed groups that operate country-wide. Conflict in Atem’s community can trigger conflict in other locales and vice versa. Atem’s childhood friend Warren—also with activist commitments - is doing a PhD on local agreements and ‘bottom-up’ peacebuilding initiatives at a university in Norway. Warren is studying there on a scholarship targeted at people from his country. He spends most of the time ‘in the field’, or in other words, ‘back at home’. Atem and Warren figure that if they create a simple app, they could support information-sharing between social activists and enable a crowd-sourced way to prevent kidnapping or killing of cattle, and the breakdown of peace. Everyone ‘knows’ that kidnappings or cattle killings signify that breakdowns in the agreement are imminent. If communities had a safe, secure, and fast way to communicate with each other, attacks could be prevented by simply moving people and animals out of harm’s way. Could Atem and Warren provide this? A ‘data-driven initiative’ in Warren’s Norwegian university provides funding, and the Informatics Department offers to help design the app. Warren and eager young computing academics and their students work to deliver a prototype app for communication. Atem works with Warren to trial the app in the field. It proves quite simple and effective where there is mobile connectivity, as kidnappings seem to reduce. The difficulty is that when the app does not work quite right or needs improvement, the Informatics Department staff cannot always spare the time and resources to fix it.

1.1.4 *Aker*

Aker is Atem’s sister. She listens to her brother talk and wonders if a similar app could help with her work. She works in an organization supporting victims of sexual violence. Sexual violence existed before the conflict, during it as part of armed violence, and has continued even in moments when peace has been celebrated. Could they have a similar app to assist in prevention and reporting of sexual violence? She wonders about whether app communication would really work for the issues and people she serves. Have Atem and Warren thought about whether women will be able to participate in their initiatives? Most of the people with information about imminent attacks will be women. Women hear and swap information on imminent attacks across communities as they go to

collect firewood or draw water to cook. These forays beyond their immediate community are also often when attacks against them occur. They become less safe the further they move from home. Climate change is forcing longer journeys as both water and wood are scarce. But would an app work? Women often don't own phones, and when they technically do, the phone's use is often controlled by the men within the home.

Is sexual violence not something that should be reported on and taken seriously as violence 'to do' with the conflict? What is peace, she wonders, if resolving conflict does not resolve this violence? Peace processes and wars come and go, and the reasons given for violence against women change, but their experience of violence does not.

1.1.5 *Owen*

Owen is sitting in an office in an Ivy League university in North America. He and his team are looking down on the same country from above. They have developed a capacity to use open-source satellite technology and images to monitor agricultural development. They have worked collaboratively across social science and geospatial technology and can now use the many publicly available satellite images to try to understand drought and where crops are doing well and where they are failing. This work sheds light on how the lives of people are affected by climate change. Their findings help inform development organizations to support local communities to be 'resilient'. Owen's team also monitors what happens when crop failure becomes a driver of displacement as people move in search of food. Until recently Owen's research would not have existed, but it has been made possible because publicly accessible geospatial imagery is now very cheap.

Today, as Owen's team monitors crops they notice something strange. All the roofs have disappeared from the houses in the area they are zoning in on. The team are instantly alarmed: people take the roofs off houses when they are moving. The houses contain metal that has a value. But the crops are still in the ground, so why are people on the move? Owen and his colleagues get other satellite imagery and look more closely further up the road. They see villages burning just a short distance away. The villagers on the move seem to know that a violent armed group is marauding towards them and are fleeing. Owen and his team triangulate their satellite data with local evidence by WhatsApp-ing some contacts in the area—yes, violence is happening. They see other villages further

down the road who seem unaware of the people and violence coming their way. Owen and his team agonize—there is a prospect of large-scale violence and death for hundreds of civilians if villagers down the road do not move. The team faces a dilemma. Will they go public with what they know and warn villages down the road? Or is this something they should not interfere in? After all, they were only trying to look at crops. Owen decides to go public, warning people locally of what is coming.

Something he did not expect happens. Another armed group further down the road hears about the attackers. They mount an ambush killing many of the first armed group as they arrive. In the North American university Owen and his team feel uneasy. This is not what they meant to happen. But was it their fault? What do they think should have happened? Are they playing God?

1.2 INTRODUCING PEACETECH

These PeaceTech stories are all drawn from real life, amended a little: the country and their coincidence in it is mostly fictional, as are some of the details. The key elements, however, are drawn from practices I have encountered across violent conflicts and often co-exist in some form within a single country as described above. The stories therefore illustrate real-world efforts concerning the business of peace, the business of development, and the business of war, all of which increasingly rely on digital technology to achieve their goals. As you go through this book you will recognize some real-life examples that resemble those of the stories above, and we will see yet other examples of digital innovation aimed at ending conflict and bringing about peace.

These are stories of what we are calling ‘PeaceTech’, a concept that describes ‘innovation in the use of digital technologies to support peacebuilding’. This book maps out PeaceTech as an emerging set of peacebuilding activities that connect to a wider digital revolution that affects all aspects of all our lives. The book assesses how PeaceTech aims to end violent conflict in deeply divided societies.

PeaceTech World, however, operates alongside ‘WarTech World’, where the same technologies also carry significant risk of escalating conflict, targeting civilians, or undermining the political institutions that offer an alternative to violence. Can tech really be used for good and to end conflict? Or do the risks outweigh the benefits? Or are PeaceTech and

WarTech inevitably part of the same picture—each attempting to outwit the other, in a mutually building dynamic?

1.3 ABOUT THIS BOOK

This book addresses the use of PeaceTech in peace and transition processes that for nearly four decades have been the main way of ending violent conflict within states. I focus on PeaceTech’s potential and challenges for supporting this practice. I suggest that we are in an age of ‘double disruption’ that defines our current moment.

The first disruption is to the practice of ending war by negotiations, brought about by changing conflict and mediation patterns, and changes to the underlying international legal order that had evolved to underpin peace processes. Peacebuilding is not a set of market transactions but an attempt to engage in a complex political practice of ending violence that has global political and legal implications. Can new technologies help us face down the new challenges of contemporary conflict? Or is the digital transition too centrally implicated in the current unravelling of the global order?

The second disruption is that of the global digital transition which has disrupted practices of peace and war. I locate PeaceTech in the wider digital transformation to understand where it sits in this broader ‘fourth industrial revolution’. Digital technologies are central to business development because they re-shape how businesses make money. New technologies are understood to have complicated disruptive effects on normal ways of doing business, with consequences for which business thrives, and which fails. I consider the ways in which digital transformation is disrupting peacebuilding, both in positive and negative ways. I also point to the role war is playing as a digital incubator, in ways that make most PeaceTech applications ‘dual use’.

Alongside the exploration of double disruption, I tell a story of PeaceTech praxis. I do so for two reasons. First, I hope the book will support those who aspire to ‘do PeaceTech’ in some form. The book draws on a ‘praxis’ experience of incubating PeaceTech projects as part of a dynamic research group responsible for the PA-X Peace Analytics: Peace and Transition Process Data (PA-X Analytics, [2025a](#)). Praxis involves using practice to generate knowledge and theory, to inform practice in an ongoing circle. There are many good reports mapping out PeaceTech, but few that engage with the practical struggles involved in doing PeaceTech

that understand how the ‘doing’ shapes what emerges. Yet, academics have sought to consider the ‘politics’ of PeaceTech, as what they call a ‘socio-technical’ system that produces a ‘socio-material’ reality. In other words, the way of doing something through a particular technology can shape the ends of what is produced, to produce something different from what was intended (see e.g., Hirblinger et al., 2022).

Our own work has involved trial and error and has given us both confidence and doubts about what PeaceTech can and should do. The book attempts to share that learning in a way that reveals and addresses the challenges of digital innovation in the peacebuilding field. This experience also demonstrates how praxis works. In developing PeaceTech applications we have been part of the ‘PeaceTech Ecosystem’ that I talk about in Chapter 7. This ecosystem is a set of practitioners, researchers, funders, tech entrepreneurs, and people living in conflict, who work to support the use of technology in peacebuilding and who collaborate directly, or work with a sense of being in a network with each other.

Second, I tell our praxis story to demonstrate how the commitment to praxis is not merely a commitment to a way of working, but to a form of ‘technomorality’ that understands PeaceTech means of production to be connected to its ends. The stories of our work illustrate complicated choices as to who to work with and how, that arise even in the simplest PeaceTech projects. Not all of these choices are morally consequential, but they point to ways in which PeaceTech pulls a wider set of business actors and interests into the business of peacebuilding in ways that the traditional peacebuilding community must reckon with. The PeaceTech ecosystem is one that is rapidly changing.

In this way, the book weaves together analysis of contemporary conflict and mediation challenges, analysis of how the wider digital revolution connects to the business of ending wars, and practical examples of the challenges of mounting PeaceTech interventions. In so doing, I hope the book embodies the self-critical reflection that I think should be carried alongside any PeaceTech practice to help shape its ambition and design. I add questions at the end of each chapter to support the reflection of others.

1.4 WHO IS THE BOOK FOR?

The book is designed to join together four groups of people who might be interested to know more, and who are all necessary to PeaceTech vision and development.

The first group is those engaged with peacebuilding as researchers, students, or practitioners, and also people who live in a conflict and who are curious to understand digital innovation in peacebuilding better. This group might be curious about the potential of a digital innovation to address a very specific problem; or might need to understand the jargon for their job; or may simply be the sort of curious person who is attracted to new ways of working.

The second group is those from a business background who are interested in digital innovation in their own businesses and how it might be more broadly relevant to ending wars. This group may find something interesting about when and how digital transformation affects the unfamiliar world of brokering peace. Active peacebuilding is now required to address the polarized world in which we all live. Businesses of all sorts often find they must understand and anticipate conflict risks if they are to protect their business. Business communities can play a critical role in conflict resolution in situations of war. This role may now be interesting for businesses in relatively peaceful states that are experiencing increased polarization.

The third group is those from a more technical digital background such as data engineers, software developers, or those who build the hardware capacity of large-scale computing, who perhaps seek more meaning and value in life and work. This group may want to understand what their skills could bring to something that has a wider global significance such as peacebuilding. They may be concerned to understand the wider conflict and peace challenges that technology poses and to understand how this affects their own ethical and risk considerations when designing or using innovative technology.

The book is also, of course, aimed at those already involved in building the PeaceTech world from within these communities. As sketched out in Chapter 7, an already present ecosystem of humanitarian, development, peace and conflict, human rights, and business actors are engaged in PeaceTech. In the last decade governments in Austria, Norway, Finland, Qatar, and Switzerland have articulated ambitions to drive PeaceTech in some sense. PeaceTech innovation is at the heart of the UN's attempts to

transform its work using a digital transformation strategy. Businesses also lie at the heart of PeaceTech production, both as designers of innovative technologies and even as direct PeaceTech practitioners.

1.5 BOOK STRUCTURE

The book provides a straightforward account of PeaceTech, focusing on the direct use of technology to end wars. Throughout I draw on the PeaceTech work that myself and the team I am part of have engaged in and learnt from.

Part I: What is PeaceTech, sketches the basic questions regarding what PeaceTech is (Chapter 2). I explain the main digital technologies shaping the field, because without a basic understanding of how they work it is difficult to understand their potential and to address their risks (Chapter 3). I consider where and how innovation is happening across inter-related fields of peacebuilding, development, humanitarian intervention, and also in areas we see as perhaps the antithesis of peace, such as securitization of civilian populations, and war itself (Chapter 4). I consider the drivers of PeaceTech and where digital innovation adds ‘value’ to peacebuilding (Chapter 5). I examine how we should understand the ‘double disruption’ of peacebuilding that we find in the current moment, where post-cold war practices of ending violent conflict are being transformed and challenged by both technology and also changes in how war itself is currently happening (Chapter 6). Finally, I set out what has been called ‘the PeaceTech ecosystem’ of who is ‘doing PeaceTech’, and some of their incentives (Chapter 7).

Part II: Doing PeaceTech sets out what I suggest are the five key transformative technologies in PeaceTech and illustrate some of the main ways each has been used to prevent and end violent conflict. These are: mobile phones and cloud computers, and their use in what I call ‘peacetechn hacks’ whereby digital innovation tools are used to improve established peacebuilding practices (Chapters 8 and 9); data analytics including ‘foundry’ approaches using AI, and their use in Conflict Early Warning Systems (Chapter 10); Geographic Information Systems and remote sensing, and their use in understanding the spatial dynamics of conflict (Chapter 11); peace analytics as the development of data-driven approaches to peace mediation support (Chapter 12); and the emergent use of AI and in particular Gen-AI as a built-in part of all of the above uses (Chapters 13 and 14).

Part III: PeaceTech Challenges address praxis challenges in thinking about, designing, and using PeaceTech applications in ways that acknowledge the importance of connecting PeaceTech design with peacebuilding ends (Chapter 15). I also point to the new ethical, legal, and technomoral dilemmas of digital innovation. I illustrate how our existing frameworks fail to address these dilemmas and point to new emerging frameworks that seek to fill the gaps (Chapter 16). In conclusion, I assess the future directions of PeaceTech (Chapter 17) and contribute a short ‘manifesto’ to shape PeaceTech and support its entrepreneurs in doing good and avoiding harm (Chapter 18).

1.6 CONCLUSION: DEEPER CHALLENGES

I am very optimistic about PeaceTech, but in conclusion there are three fundamental challenges for PeaceTech that are also general challenges for our times. Understanding and responding to these challenges will require us to rethink peacebuilding. I would even suggest that humanity’s ability to deal with these challenges will be existential for the human race. These are the challenges of: ‘double disruption’, ‘exponential speed’, and ‘value alignment’ and they appear throughout the book.

Double disruption as noted is the challenge posed by fast-paced change in conflict and peace dynamics, when coupled with fast-paced change brought about by digital transformation. Double disruption and its consequences are set out in Chapter 6. Double disruption arises from a deep entanglement of peacebuilding, warmaking, and digital transformation. I suggest that, paradoxically, PeaceTech is now one of the few ways of getting the capacities we will need to address double disruption.

Exponential speed involves the challenge of keeping pace with the superfast transitions happening simultaneously across conflict, mediation, and digital spaces. It is difficult to use PeaceTech to achieve peacebuilding coherence in a world in which global order is being radically reworked almost daily with scary consequences for conflict generation, and where technological innovation is also in a period of chaotic exponential growth.

Value-alignment is the challenge of ensuring that PeaceTech developments remain aligned with the values of peacebuilding, which can be summarized as justice and fairness (human rights), fostering

good relationships and agency for peace, and respecting diversity. Value-alignment challenges are coming to the fore generally but are exacerbated by AI as considered in Chapters 13 and 14.

Throughout the book I offer thoughts as to how PeaceTech may be part of the solution to these challenges. I begin and end with the idea of ‘praxis’ as the need to connect practice with theory, to produce a self-reflective iterative-learning approach to digital innovation in peacebuilding. Praxis involves not just using technology for peacebuilding, but understanding and re-shaping that technology in an attempt to address the challenges that war and technology pose for humanity.

Questions

1. What is your reaction to the stories?
2. What examples of PeaceTech can you think of?
3. Do you have other terms you use for PeaceTech?
4. Do you recognize double disruption, exponential speed, and value-alignment as challenges for peacebuilding and challenges of ‘our time’?

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PART I

What is PeaceTech?



CHAPTER 2

PeaceTech—What Is It?

Abstract This chapter examines definitions of PeaceTech and associated terms such as ‘digital innovation’ and ‘peacebuilding’. It explains that the book is focused on digital innovation to end wars through mediated processes, and illustrates how this focus connects to wider understandings of peacebuilding and the PeaceTech field.

Keywords Civicism · Digital innovation · Peacebuilding · Peace processes · Technology

2.1 CONFLICT AND ANALOGUE LEGACIES

A year after the Belfast/Good Friday Peace Agreement was signed in Northern Ireland in 1998 (Northern Ireland, 1998), marking the formal end of a long conflict, a brilliant two-minute radio series called *Legacy* was broadcast. As the Agreement’s implementation unfolded, including the release of many individuals convicted and imprisoned for conflict-related killings, each *Legacy* programme provided a short audio testimony of an anonymous person whose relative had been killed in the conflict. These heartbreaking testimonies can be heard as part of the *Legacy* Series (BBC Radio Ulster, 2025).

Over 1999, daily stories came from people such as: the policeman’s widow; the ‘totally innocent’ child killed because they were in the ‘wrong

place at the wrong time'; the pro-state ('Loyalist') armed actor killed by his own side for informing; or the Irish Republican Army (armed group) member shot dead by security forces.

Legacy played an innovative peacebuilding role. It exposed people to the common loss and grief of relatives of those killed, across divisions and regardless of perceptions of the person's 'victim status' in terms of perceived complicity in the conflict. By focusing on the experience of those left behind, the stories created a powerful public conversation regarding the shared experience of grief and loss. It was a daily reminder of the costs of the conflict that quietly bore witness to what was at stake in maintaining the peace.

The *Legacy* Series contributed to peacebuilding, used technology, and was innovative. Was it therefore PeaceTech? PeaceTech sounds new, but the technology—radio—was very old. Northern Ireland itself can testify to just how old. It was in 1898 that some of the first attempted cross-Atlantic wireless signals by Guglielmo Marconi were transmitted from Rathlin Island and Ballycastle, Northern Ireland, across the Atlantic. You can still see the 'Marconi cottage' where he worked—it is now a fancy coastal house. Marconi was to return to Italy during the second-world war where he was a Mussolini supporter—not what we would think of as pro-peace or associated with the Nobel Prize in Physics that he had won. Marconi PLC, the company which emerged from his work, still exists as a major player in communications including mobile technology, with a central role in digital innovation (see Reference for Business, 2025, for the company's history).

2.2 DEFINING PEACE^TTECH

The *Legacy* radio programme poses the question: what exactly is PeaceTech? As we will see PeaceTech is experimental in nature and there are many diverse examples that could be labelled PeaceTech. This experimentalism makes it difficult to define or to draw good boundaries as to what is PeaceTech and what is something else.

The following definition is a useful starting point:

PeaceTech is the use of digital innovation to support peacebuilding practices to be improved and extended.

There are other possible definitions that have overlaps and are set out in the Box below. Our definition, however, needs more definitions to make better sense.

PeaceTech Definitions

PeaceTech is....

... an umbrella term for technologies (software and hardware) that are being developed and used in efforts to prevent or end cycles of violence in society, building and sustaining peace. (Carl, 2024)

...the movement to use technology to end violent conflict and extremism. (Heidebrecht, 2022, p. 101)

...

- Products and services that help foster relationships between groups, protect people from the effects of violent conflict, disrupt the tactics of violence, or respond to the root causes of conflict.
- Tools that foster positive outcomes like enhanced social well-being, sustainable economies, stable governance, rule of law, and safe and secure environments.
- And so much more. PeaceTech Lab. (USIP, 2025)

.... technology that contributes to peacebuilding. Digital peacebuilding is the broader nexus between the field of peacebuilding and digital technologies. (Schirch, 2020, p. 1)

2.3 WHAT IS DIGITAL INNOVATION?

If PeaceTech involves digital innovation, what then is ‘digital innovation’? Is it the use of a new technology, such as the satellite imagery that Owen was using in Chapter 1? Or is it the innovative application of an existing technology to a new peacebuilding application? Firchow and Mac Ginty, for example, used SMS text messaging to survey a population with little

internet connectivity on what peace would look like for them, and what would need to change for them to experience peace (2020). Is use of SMS texting really ‘digital innovation’? As with radio, people have been texting for decades. It is not a terribly innovative technology. But then come to think about it, the first satellite was Sputnik 1, launched in 1957, so satellite technology is in fact older than SMS texting (which seems to have arrived in 1992).

Yet, using satellite and texting for peacebuilding involves forms of innovation. It was Firchow and Mac Ginty’s use of SMS to create a participative local process for ordinary people in hard-to-reach communities to define peace that was new. Their ‘Everyday Peace Indicators’ project involved a creative attempt to measure the success or failure of peace processes ‘from the bottom up’ (see also Everyday Peace Indicators, 2025). Using texting, they generated bottom-up peace indicators and used them to measure perceptions of peace in hard-to-access populations. No-one engaged in implementing the peace processes had ever really bothered to ask people what they thought peace should look like, or what they wanted from it—what would have to change for them to experience peace? Yet, why should international supporters of peace processes define what ‘peace’ looks like from a perspective of ‘when can we leave’? Is it not important that peace is felt in people’s everyday lives, far from the capital cities that international actors reside in? Everyday Peace Indicators are now taken seriously by international organizations as a way of benchmarking positive change. Interested organizations include those we think of as disconnected from local communities, like the World Bank.

Using SMS therefore contributed to a transformation in how to define and monitor peace by changing whose experience ‘counts’, although also raised new inclusion challenges related to who had access to mobile phones (for discussion of these challenges and how to navigate them, see Firchow et al., 2017; Demombynes et al., 2013). *Legacy* and radio broadcasting are even more ‘analogue’ than SMS. But in societies with low-connectivity, radio may be a very effective way to reach large sections of the population. Is new always good when it comes to technology?

Similarly, what is new about the use of satellites for peacebuilding is not satellite imagery per se, but improved imaging capacity, and the fact that access to images can now be obtained cheaply or even open source. As a result, researchers, citizens, and non-governmental organizations can now

sometimes use satellite imaging for new purposes such as peace monitoring. We will look at PeaceTech use of satellite technology further in Chapter 11.

2.4 WHAT IS PEACEBUILDING?

The second definition that our starting PeaceTech definition would need to clarify is: what is peacebuilding?

‘Civiness’ is a useful concept for capturing the focus and spirit of ‘peacebuilding’. It was coined by Mary Kaldor and colleagues who work as members of our PeaceRep team. The word civiness is at the heart of our PeaceRep research programme as a way of working that seeks to counter-act logics of war. Kaldor and Radice describe civiness as three things in one:

- (i) as a logic of public authority, that speaks to ideas of rights-based, inclusive rather than exclusive political orders; (ii) as a form of behaviour, acting ‘as if’ such a logic existed; and (iii) as a political position, articulated against un-civic politics, in particular the combination of endemic corruption, ethnic or religious sectarianism and economic and social injustice. (2022, p. 125)

Is peacebuilding everything that has some sort of ‘peace impact’ or creates civiness? Well my goodness, this could be literally everything. Paypal (2025) and Airbnb (2025) for example, work in interesting ways to generate trust between strangers, a form of civiness. Is creating trust between strangers a form of peacebuilding? To use Paypal as an example, complete strangers enter into transactions with each other at a distance without even knowing if their identity is real. In 2022, Paypal had 392 million active users who conducted 15.4 billion transactions that generated \$21.4 billion revenue (Galov, 2023). Four hundred and twenty-six million users transacted at least once in that year. Fraud rates were only 0.12 percent—less, Paypal claim, than most competitors. So Paypal generates a lot of trust and its success in getting people to use it depends on this trust.

Paypal sees its system as rooted in four core commitments, three of which appear to be more connected to a morality of ‘civiness’ than what we might think of as money-making commitments. These are:

- transparency—that we might think of as a public good
- data protection—that we might view as rooted in individual rights
- a commitment to fighting fraud—that we might view as a commitment to civiness by tackling uncivic behaviour of corruption.

Their fourth core commitment is ‘using payment methods that are popular with customers’ which appears to be purely business-driven. But we could see this fourth commitment as having something to do with civiness if we put it in a different way, for example: being ‘responsive to people’, or delivering maximum ‘digital financial inclusion’. By using technologies that people already use, Paypal aims to include more people by meeting them where they are at, rather than assuming they will become more ‘tech-savvy’.

While I have suggested that Paypal’s values encapsulate a form of civiness, Paypal likely committed to these values because they generate the trust that is central to their business model. They need people to trust the service to use it.

So is Paypal ‘peacebuilding’? Let us review: it creates peaceful interactions between people and promotes trust based on commitments that have a moral dimension rooted in civiness—something I have suggested is at the heart of peacebuilding. Paypal also improves the world in a lot of peaceful ways by enabling globally-connected commerce, charity payments, and gifts to friends and family. But we would probably hesitate to call Paypal an exercise in ‘peacebuilding’ as the ‘peace’ element is indirect and unintentional, and in ways an accidental side-product of trying to enable online commerce.

Perhaps we should not be so hesitant. One of the greatest threats to peace in our times is currently disinformation. People fighting against social media circulation of disinformation as a threat to peace are doing all sorts of innovative thinking on how to address this threat. These people find themselves thinking a lot about the ways in which systems themselves work to generate trust or distrust.

Some of those concerned with peace and human rights lobby social media companies to engage in ‘content moderation’ to remove illegal content or disinformation (see Barrett & Hendrix, 2022; Barrett, 2022). While the intent of social media platforms such as X/Twitter was to provide merely a mechanism for people to exchange views, there is now greater awareness of their real-world power to shape views and enable

polarization and violence of different sorts. This awareness has created pressure to moderate what is put on the platforms.

Beyond moderation, peace and human rights actors also engage with the more invisible ways that social media encourages dispute between otherwise civically minded people (see e.g., Fournier, 2021). Social media such as X/Twitter and Facebook uses algorithms to promote ‘engagement’ to keep people scrolling and expose them to more advertising (also chosen by algorithms). These algorithms promote emotionally provocative feed rather than factually correct feed, because the former has been found to better promote engagement with the platform (see Lanier, 2018). Social media platforms defend the neutrality of their algorithms on the grounds that they reflect user preferences and promote interaction of platform-users. For those concerned about peace, however, accentuating dispute leads to social polarization. The mechanism of polarization is particularly insidious because users do not fully realize how they are being drawn in. If you are pro-peace, promoting dispute is not neutral.

As a result, PeaceTech is centrally concerned with social media platform reform. The New York University Stern Center for Business and Human Rights, for example, has set out recommendations for how social media companies could reduce the harms of polarization (Barrett, 2024). Some peacebuilders also look to the trust-creating mechanisms of online commerce such as Airbnb or Paypal to understand how a platform creates trust rather than polarization.

Trying to influence how technologies are designed to promote healthy relationships instead of destroying them is sometimes called ‘pro-social design’. For example, the Council on Technology and Social Cohesion is a group of ‘tech innovators and peacebuilders design technology, that strengthens social bonds and enables collaborative problem-solving on pressing policy issues’ (2025). One member, Lisa Schirch, has produced a blueprint for pro-social tech design governance that makes recommendations aimed at preventing the harms caused by social media (2025).

Pro-social design approaches also shape peacebuilding engagement with artificial intelligence (AI). Multiple tech-for-good initiatives try to influence the design of AI to enable peace. For example, the Global Partnership on AI (2025) was set up in 2020 as ‘a multi-stakeholder initiative bringing together leading experts from science, industry, civil society, international organizations and government that share values to foster international cooperation’. It now operates in partnership with the

Organization for Economic Cooperation and Development (OECD) and subscribes to its Principles for Artificial Intelligence (AI) (OECD, [2025b](#)). This partnership focuses on ‘how governments and other actors can shape a human-centric approach to trustworthy AI’. Broadly speaking, this move to responsible AI is in some deep sense ‘about peacebuilding’ and a form of PeaceTech.

2.5 PEACEBUILDING RIPPLES

While the term peacebuilding can cover all pro-peace activities, it is often given a narrower meaning by communities of practice and scholars as:

Activities taken in response to violent conflict within societies that aim to address the conflict around them directly or indirectly to produce more peaceful outcomes.

As with the term PeaceTech, there are different definitions of peacebuilding and other terms for similar concepts, some of which are set out in the box below. These definitions are useful to read to see how peacebuilding is talked about. But the definition above captures things well enough for our purposes.

Peacebuilding Definitions

Sustaining Peace ‘should be broadly understood as both a goal and a process ... which encompasses activities aimed at preventing the outbreak, escalation, continuation and recurrence of conflict, addressing root causes, assisting parties to conflict to end hostilities, ensuring national reconciliation, and moving towards recovery, reconstruction and development....’ (UN General Assembly Res 70/262 [2016](#); UN Security Council Res 2282, [2016](#))

Peacebuilding is the development of constructive personal, group, and political relationships across ethnic, religious, class, national, and racial boundaries. It aims to resolve injustice in nonviolent ways and to transform the structural conditions that generate deadly conflict. (Kroc Institute for International Peace Studies, University of Notre Dame, [2025](#))

Peacebuilding refers to activities aimed at assisting countries emerging from conflict, reducing the risk of lapsing or relapsing into conflict and laying the foundation for sustainable peace and development. (United Nations, [2025b](#))

Conflict prevention ‘is about creating incentives for actors to choose actions that resolve conflict without violence. Effective prevention requires acting before grievances harden and the threat of violence narrows the choices available for leaders and elites, understood as groups who hold power or influence in a society.’ (World Bank, [2018](#), p. xxi)

To understand the examination of PeaceTech in this book, and the possible scope of the PeaceTech field in general, it can be useful to think of peacebuilding activities in terms of different widening spheres of activity, from those focused on negotiating ends to violent armed conflict, widening to the more diffuse conflict resolution efforts for any society in which violence is a social condition. Like a set of ripples. Figure [2.1](#) illustrates.

The inner circle comprises peace and transition processes to end militarized conflict through peace process negotiations. These negotiations may focus on reaching a formal structured agreement to end the conflict as a whole. Or they may focus on reaching an initial ceasefire that could enable aid to be delivered and so build confidence in negotiated solutions. Negotiations in the early stages of conflict may be brokered by civic initiatives to bring armed groups together to reach agreement that can stop emerging conflict from escalating. For example, a Humanitarian Agreement for Benghazi in 2016 (Libya, [2016](#)) signed by civic leaders and groups engaged in conflict sought to address nascent conflict. John Paul Lederach in his wonderful book ‘The Pocket Guide for Facing Down a Civil War’ ([2024](#)) calls these ‘pocket peace’ interventions because they create pockets of de-escalation. He suggests these interventions can disrupt local conflicts and so prevent them from becoming woven into a national conflict system that is more difficult to resolve.

The second circle includes a broader range of activities that take place in war zones with or without a clear conflict resolution process, whereby individuals and organizations address violent behaviours or dynamics of

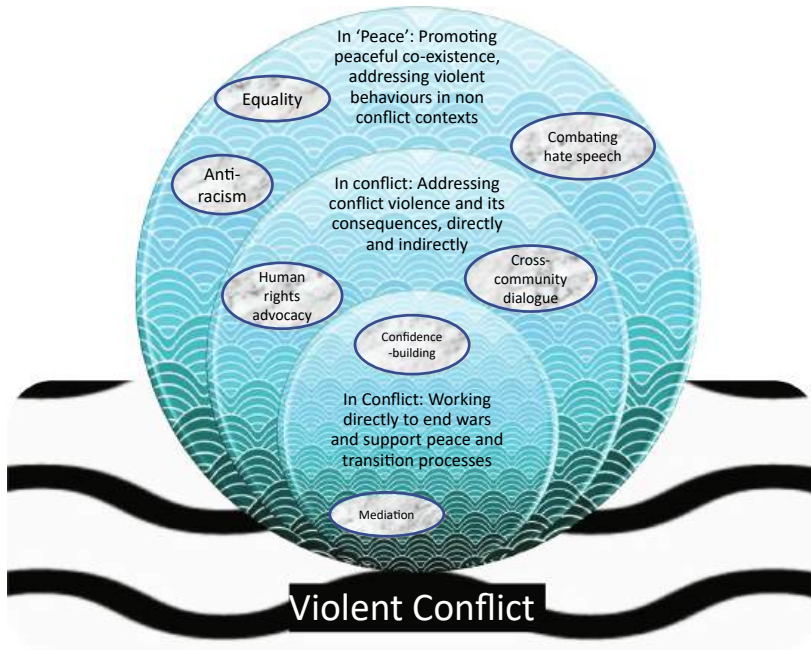


Fig. 2.1 Peacebuilding ripples

distrust that create violence. Interventions include attempts to counter violence by creating spaces of dialogue or civiness as an alternative, and projects to support those who are affected by violence. Examples include supporting women's groups to meet across communal divides to try to address common problems of poverty. Or victim's groups bringing together those hurt by the conflict regardless of where they come from. Or inter-school reconciliation groups that attempt to create understanding across the social divisions that separate young people. All of these activities try to build civiness in the face of uncivic, violent behaviour that seeks to destroy people and their relationships and communities.

In the widest circle are all peace-focused activities that operate in societies we think of as peaceful, that nonetheless have violent spaces and practices. These activities can include an anti-racist group seeking to combat racial polarization, injustice, and violence against minorities; or people seeking to address inter-gang rivalries and knife crime; or groups

trying to address ‘polarization’. For example, The International Catalan Institute for Peace located in Barcelona in 2020 conducted surveys on polarization in an attempt to understand the nature of polarization and what it means for ‘a culture of peace’ in Catalonia and more widely (International Catalan Institute of Peace, 2020). The survey produces interesting results on what types of polarized views people can hold without it affecting their emotional relationship to people different to them, and what types of polarized views translate into treating others badly.

2.6 PEACETECH AND ENDING WARS

Returning to our definitions: so far, our discussion illustrates the difficulties of deciding how ‘new’, how ‘innovative’, and how ‘peace-focused’ digital innovation needs to be in order to be considered PeaceTech. There is no exact way to draw a circle around PeaceTech. It depends what we want to give the label to.

The good news is that we do not need to get too agitated about the exact boundaries of PeaceTech: labels are merely useful ways to help us talk to each other about the same thing. If we understand peacebuilding to be broad and ‘everything that is to do with peaceful co-existence’, then we will have a broad definition and conversation about PeaceTech involving all the ways in which technology is being used by those who have an agenda of peace, or even by those who work on values such as ‘trust’ that we associate with peace. This approach can see PeaceTech applications in countries such as the United States or United Kingdom where there is no violent conflict with armed actors (even though some forms of organised crime and state violence come close to creating similar conditions in some areas).

This book focuses on the innermost circle of peacebuilding focused on direct attempts to end violent conflict, by using technology to support reaching agreements to that end. Throughout, however, I will give a flavour of PeaceTech activities in the wider circles because practices, actors, and capacities connect across circles.

My focus on this narrow circle of PeaceTech—digital innovation to end wars—is partly because ending war is one of the most pressing issues of our time. It is also personal. I grew up until my early twenties in a conflict in Northern Ireland, without realizing what was happening around me was not normal. The weirdest part of life as I look back was the curious

way that normal life and completely abnormal life were all mixed together until you couldn't really tell what normal was. As a young child, I never really understood that the conflict was not normal, what it was about, or how I and my family were positioned as regards its various 'sides'. Over time, I learnt of course, and experienced directly the violence.

Jumping forward to when I was an adult and the peace process arrived, I realized that without some sort of agreement with those involved in the fighting it was unlikely to end. The peace agreement reached in 1998 formally brought the conflict to an end. It also marked the beginning of the real peace process of rebuilding government, human rights, and relationships, generating twenty-two further implementation agreements to date. I was involved through the women's sector and through human rights work in trying to ensure that a sustainable agreement was reached. That work started nearly thirty years ago, and over time has resulted in the PeaceTech initiatives described in this book. Since then, I have been interested and involved in how conflicts are brought to an end, not by victory or defeat but by agreement, and have worked as a mediator or supporting mediation efforts, including with the United Nations, in a wide number of conflict-affected countries. I am therefore interested in how and when PeaceTech supports attempts to end conflict through mediation and the peace processes that unfold.

Questions

1. Do you agree with the definitions of PeaceTech?
2. Is it new? Does that matter?
3. Is the PeaceTech label a helpful one, or does it lump too many things together?
4. What do you view as peacebuilding? Which of the three circles are you most interested in?

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PeaceTech Technologies

Abstract This chapter sets out the key ‘digital revolution’ technologies that are transforming peacebuilding to produce PeaceTech. It considers how they work technologically and sets the scene for understanding their use in particular types of PeaceTech innovation in the chapters that follow.

Keywords Cloud computing · Internet of Things (IOT) · Remote sensing · Geographic Information Systems (GIS) · Artificial Intelligence (AI) · Generative Artificial Intelligence (GAI)

3.1 RUNNING HARD TO STAND STILL

The fastest runners in the world are Ethiopian and Kenyan (Douglas & Boswell, 2025). This was first brought home to me when two Kenyan runners caught up with me in a half marathon, having started two hours after I did. Theories of why Ethiopian and Kenyan runners are so fast have included: genetics; expanded lung capacity from training at Kenya’s and Ethiopia’s high altitudes; cultural and historic attitudes to running; team training methods; and training schedules that focus on long slow runs.

Both Ethiopia and Kenya have had complex conflicts and peace processes that have continued many years. These conflicts are seldom discussed in running magazines although they have affected even race

winners. In 2023, unexpected London marathon winner Sifan Hassan had fled Ethiopia at fifteen years old as a refugee from war.

Ethiopia reached a peace and transition agreement in 1991 as a result of a victory by a range of ethnic groups that united against a vicious dictatorship known as ‘the Derg’ (Ethiopia, 1991). In 1994, a creative constitution built a federal country (Ethiopia, 1994), but conflicts have remained in different areas, as have peace processes.

I worked on and off for several years with people of Somali identity in the Ogaden region of Ethiopia, who built a relatively successful peace process and agreement that interestingly was mediated by a Kenyan government facilitation team (Ethiopia/Ogaden, 2018). Other conflicts continue and emerge. In 2023, for example, a brutal conflict in the Tigray region of Ethiopia broke out involving allegations of war crimes and leaving an estimated 600,000 killed. As I write, a new version of this conflict threatens to erupt to little media fanfare, despite its capacity to drag Eritrea and Ethiopia into an international war with regional ramifications (Al Jazeera, 2025). In Kenya, post-electoral violence in 2007–2008 saw more than 1000 people killed and led to transition agreements and a transition that in a sense remains ongoing (see further, Paffenholz, 2021).

Back to running. For those of us who are not so swift, in countries that are predominantly located in the Western world, the search for improvement in running has involved Fitbits, Garmins, Apple Watches, and a range of wrist ‘fitness trackers’, which track steps, speed, route, and when and how you did the activity. I raise this for a reason.

3.2 WHAT ARE THE KEY NEW PEACE^{TECH} TECHNOLOGIES?

We often talk about PeaceTech without really talking about the Tech. It is important to understand the key technologies, their distinctive terminologies, and how they interact to create new ways of working, if one is seeking to understand their use in peacebuilding. Understanding how the tech works also exposes risks that must be taken care of. Fitness watches are a good, if trivial, example of how a range of technologies work and what they are called. They illustrate how these technologies connect to digital transformation that affects every aspect of our lives.

Fitness watches are fitness trackers that look like watches. However, they are actually little computers that log data from your wrist. They work as part of a system of interrelated computing devices that include phones

and computers and satellites. Each wrist tracker has a unique identifier that operates like a name to mark each watch as distinct a ‘thing’ that is distinct from other watches. When you register the watch and connect it to the company’s systems, the company will give you a unique identifier—you too will be a ‘thing’. These computers have ability to transfer information over a network without any human being involved. They are part of what we call **‘the internet of things’** or **IoT** for short (see box).

Internet of things (IOT): the network of physical objects or ‘things’, that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the internet (Oracle, [2025](#)).

We will see how things such as sensors are used in PeaceTech. The idea that we too can become ‘things’ is now intrinsic to war technology, and part of a blurring between people and technology that is characteristic of the digital revolution.

For you to use your fitness watch to analyse your performance and compare it with others, your watch will count steps and measure your elevation with reference to already coded data on maps and sensors within the watch, as well as satellites in the sky. This data will be recorded on the watch’s mini-computer which will then transmit it to **‘the Cloud’**. ‘The Cloud’, as its metaphorical name suggests, is like a big computer and storage system in the sky (see Box). Cloud computing is available on demand and offers both computing power and ways of storing data without your active management.

The Cloud: a network of global servers, with software that enables remote storage and computing by external users. Cloud computing is computing happening on those servers, rather than the user’s own computer.

When you buy your watch, you do not just buy the piece of plastic on your wrist; you buy a system that also puts the data it collects into the cloud and stores it there. Sometimes you get access to the Cloud as part of the deal with the watchmaker, with the price of the watch covering storage with capacity to connect your personal data to a range of other products and services. Where extra cloud storage is paid for, it is not usually bought as a permanent piece of storage space, but is in-effect rented for a periodic fee. There is a word for the move from purchasing a thing as a once-off, to purchasing a service: ‘servitization’ (sometimes referred to ‘software as a service’ or SaaS).

We will return to servitization in Chapter 15, but let’s explain it here. Sell a thing and the person pays for it once. Change it to a ‘service’ and it is paid for on an ongoing and even indefinite basis. Servitization goes hand-in-hand with digital innovation as it is a way for businesses to create revenue streams to continue to develop their product and make a profit.

Servitization is not just a cunning new capitalist tool to keep charging you (although it’s that, too): it makes some sort of sense in the field of digital provision because digital innovation is fast paced. Email systems such as Gmail, for example, are constantly being improved and integrated into other products. The storage service fee enables system maintenance and improvement, including the promise of ever-improved security for the consumer.

The Cloud of course is not a magical storage container in the sky, but a complex set of machines and software that has a physical existence ‘on-the-ground’ somewhere. Amazon, for example, which started as a bookseller, expanded to selling more and more things until it became the world’s biggest marketplace. Part of its success lies in the data that its online ordering system collects about customers, that Amazon can then connect to a whole range of other sellers and products. Over time more and more customers mean more and more data. Amazon has dominated online selling because it has built customers and data in an ever-increasing loop that means it can quite simply sell goods more efficiently than almost any other company because it can use its data analysis to reach more customers and even predict to them the types of goods they might like. Amazon has had to build the **data facilities** needed to sustain all this data-crunching. These data facilities are now themselves a major product that Amazon markets. One can buy storage on amazon and use its ‘data facilities’ as itself a product (see details of where they are at Data Centre Map, 2025).

This short digression shows us that behind digital innovation and ‘the Cloud’ is computing hardware and software housed very much on the ground in data facilities that require architected physical actual warehouses, and architecture in computer engineering terms.

Back to your fitness watch. As you run, your watch can calculate and produce ‘**real time analytics**’, such as how fast you are running, your average pace, and your ‘cadence’ (how many steps a second you are running). Real time analytics may also tell you how fast your heart is beating and what ‘zone’ of exertion it is in—for which it will compare your heart rate to statistical norms for people your age and size, at different levels of exertion, something that itself requires a lot of data and algorithms. Real time analytics are therefore ‘right-now’ analytics, and they can be useful in helping you adjust things in the moment—in my case, I run a bit slower to bring my heart down from the heart attack zone.

Once you have completed your run your watch may transmit your data to the Cloud. Computer programmes in the cloud can then put it together with other fitness watch user data to tell you how your run compared with other previous runs you did, what your elevation was, what distance you have run over the past day, month, and year, and how you compare with others in your age group, etc. This information involves ‘**data analytics**’ (that is, analysis of data). The data analytics requires ‘**big data**’ capacity, as it lets you compare your data with hundreds, thousands, and even millions of other fitness watch users. These ‘others’ might be others with the same watch and app, but if you have linked to some broader fitness app, such as Strava (2025), you may be connected to users of lots of different types of watch. Strava can also be connected to social media accounts. Strava will have data-sharing agreements that enable it to pool information from even more people than have signed up to create ‘big data’.

This data can then be analysed using ‘**machine learning**’ which, for example, can ‘cluster’ groups of similar users. This type of computation would be beyond human capacity to do quickly, given the number of data points.

Big data: data of a very large size, typically to the extent that its manipulation and management present significant logistical challenges (Oxford English Dictionary, 2025). It is characterized by ‘the three “vs”’: high **variety** data, high **volume** of data, and requirements for high computing power to process data at **velocity**.

Your data together with this ‘**big data**’ will be fed into systems that very quickly can produce data analysis to tell you things about yourself and others around you—who you might want to connect with, who ran past you, who took the same route, who has run that route most frequently, etc. These systems will often try to sell you things as well, using forms of predictive artificial intelligence.

You may see your running data on your watch face, but you may find it easier to look at it on your phone. Your watch will automatically synchronize with your phone. It does not do this by linking into the Cloud: it does so by **Bluetooth**, a way your phone can connect wirelessly with other devices. Bluetooth is a technology that has developed from creating a set of industry standards that enable different devices to share things wirelessly if in close proximity. This connectivity means that the data goes straight from the computer on your watch to your phone without being beamed up to the Cloud and back down again.

In essence a quick form of mini network connects the two devices (IoT again). So, your phone and watch will be set up to automatically synchronize without any action from you, as soon as they are in close enough proximity for their wireless (Bluetooth) connectivity to work. While data going to a central computer or cloud takes some time, your watch and phone connect at what is called ‘**the edge**’. The transfer from watch to phone is known as ‘**edge computing**’. Typically, this sort of transfer of data offers more speed, because it reduces the distance between devices, and that can be useful. More speed equals less ‘latency’, which all sounds very complicated, but latency is just ‘delay’. The faster something moves, and the closer the distance, the less time it takes to get there. Edge computing therefore brings efficiencies.

Your fitness watch can do other things. It can show you maps and your route as you run, and after. It can jiggle on your wrist when you pass a turn-off you should have taken. It does this by being linked to a ‘**Geographic Information System**’ or **GIS**, which enables it to plot runs

on an online mapping system. The watch uses a range of things to ‘locate’ you and geocodes the information into location data that can be put on a map. Typically, your watch will try to place you by linking you to a satellite thousands of feet above the sky, and it will let you know ‘GPS on’ when it connects. **GPS** is the ‘**Global Positioning System**’ involving a satellite navigation system that can tell to around twenty metres where you are in the world. Satellite data can be triangulated (data analytics again), with where you are in relation to wireless networks around you (the Cloud again), and sometimes in relation to other devices near you (IoT again) to improve the accuracy of location detail. Sometimes you will connect to the GPS through wireless technology or mobile data technology. Sometimes you will do it without either because your watch or phone contains a ‘remote sensor’ that can be picked up by the GPS. ‘**Remote Sensing**’ is something that we will see feature as part of Conflict Early Warning Systems in PeaceTech world. These types of spatial data showing where you are in the world with reference to other people, things, and places can be used to create a **GIS** that can display your data on maps of different types.

Remote sensing: the process of detecting and monitoring the physical characteristics of an area by measuring its reflected and emitted radiation at a distance (typically from satellite or aircraft). Special cameras collect remotely sensed images, which help researchers “sense” things about Earth (United States Geological Survey, [2025](#)).

Finally, your watch may track things other than running. Here **AI** or **Artificial Intelligence** is central. Your watch may have artificial intelligence software that enables it to ‘learn’ activities that were not programmed into the watch (see eg., Bosch, [2025](#) on how it uses AI in its fitness watches). The software, for example, may calculate the lengths in a swimming pool by using previous swims and matching length with strokes counted. AI may also provide new statistics such as your ‘fitness’ score over time (see for example Strava (2022) on how it calculates a fitness score). Over time your watch may generate forms of advice for you in an almost human way, by drawing your fitness data together with other

known correlations between data fitness outcomes, such as suggesting good days for training, or offering tips on how to step up your fitness regime.

These functions use a combination of **ordinary or traditional AI** and increasingly also use ‘**Generative AI**’ (**Gen-AI**). Traditional AI has been used for a long time to make smart predictions for businesses by crunching existing data and using that information to predict how they might better market goods to customers; it is the technology that supports crunching your running stats to make predictions. Gen-AI is a sub-section of AI and uses **Natural Language Programming** (NLP) developed through **Large Language Models (LLMs)** to create mathematical understandings of the relationships between words by examining huge scales of textual data. Gen-AI then essentially predicts which words might come next in ways that can generate smart responses to questions that appear almost human. The term Generative AI also includes similar techniques for producing pictures and computer coding. Different Gen-AI models exist including OpenAI’s ChatGPT range of models (ChatGPT, 2025), that produce ‘human-like’ responsive answers to any question you write. Gen-AI can turn statistical analyses into more narrative insights or provide mechanisms such as chatbots that answer questions.

Machine learning: a sub-branch of artificial intelligence (AI) and computer science that works to build models from existing data, and use them to classify data and predict outcomes, typically using statistical methods and capable of being used with large scale data.

Artificial Intelligence (AI): simply means the simulation of human intelligence by machines, often using machine learning, large language models, and algorithms. It can be useful to talk about different types of AI, traditional or generative.

Traditional or Ordinary AI: uses pre-determined algorithms to perform set tasks, such as making predictions based on analyses of the data. It is used in business settings to offer customers products they are predicted to like, such as Netflix films, and works best for specific tasks that can be achieved in the limits of the algorithm (see Wohlfarth, 2025).

Generative Artificial Intelligence (Gen-AI): AI that now goes further than Large Language Models (LLMs) in generating text, pictorial data or computer coding. A user prompt or question generates a human-like response in the form of text, image or code (IBM, 2025). Gen-AI tools include ChatGPT and Dalle (ChatGPT, 2025), Llama (2025), and Claude (2025).

Natural Language Processing: computer-processed statistical modelling of natural language to understand the relationships between words. NLP is a foundation for Gen-AI.

Large Language Models (LLMs): models of natural language processing based on large-scale ingestion of data that subject that data to statistical analysis and machine learning to understand the relationship between words in ways that enable the model to essentially predict what comes next. LLMs are the foundation of Gen-AI, as they enable generation of text.

The simple fitness watch uses all these technologies and is now likely to go further than merely analyzing your performance. It will use machine learning and Gen-AI to provide ‘insights’ into your performance and even advise how small changes in your training and performance might impact on your results. My watch, for example, has told me that I am more active on a Thursday, for reasons I cannot fathom. Your watch can use your average pace across runs to predict what your finish times might be in a race. It can start to tell you how you might pick up pace if you want to meet your goals. If the watch is a recent model it will also perhaps offer advice on when you are ‘stressed’ and even autonomously choose forms of breathing exercise for you to consider doing. Gen-AI may draw not just on your data but on a huge repository of research and online materials to craft answers and advice regarding how to optimize your health.

Fitness watches are now becoming more ambitious—they can monitor your temperature, your heart rate, or even your glucose levels if you are a diabetic. At some point in the near future your fitness watch may use AI and be connected to a glucose monitor and administer a dose of insulin pre-emptively and autonomously (without a person making a decision) when your glucose levels rise to an unsafe level. The combination of data analysis, prediction, and health advice is starting to further transform fitness watches into ‘health wearables’. For example, Whoop is a

form of ‘health wearable’ that focuses on generating personalized health insights and recommendations using a mix of all of the above technologies (Whoop, 2025). The watch-like device also boasts of having ‘got rid of the watch face’. Watches are no longer watches at all!

3.3 THE FOURTH INDUSTRIAL REVOLUTION

Who knew fitness watches were so complex and used so many multiple innovative technologies? They are one small part of a wider digital revolution that touches every aspect of life, characterized by the ‘blurring of boundaries between the physical, the digital, and biological worlds’ (McGinnis, 2023). This revolution, emerging in the last decade or so, has been called ‘the fourth industrial revolution’. There is a little debate as to what the first three were (see further Schwab, 2015).

Most noticeably, the current digital revolution has revolutionized businesses, whether of watchmakers or in other areas, by reshaping connectivity, production, consumption, and the speed and efficiency at which things can be done. In fact, regular watchmakers are no longer the makers of fitness watches. The makers of fitness watches are the makers of phones, such as Samsung and Apple. We will come back to the impact of innovation on businesses in Chapter 6.

Interestingly, while I said the digital revolution has revolutionized ‘noticeably’, many underlying technologies are designed to remain unnoticed. Digital innovation now permeates most of the online tools we use, where cookies stalk us invisibly until they know more about us than our best friend or even ourselves. It is built into the ‘things’ around our house, such as sensors that switch on lights or heating automatically. It includes the apps we sign up to for much daily business, that then automatically gather data from us on how we use them.

We probably think of digital watches and these wider technology uses as a ‘developed country’ thing, gone a bit mad. I am not sure my fitness watch has in fact improved my fitness. But I do now at least know how unfit I am and can get advice on the optimum way to up my game. However, the digital technologies they illustrate help businesses offer new goods and services that build competitive advantage and increase sales and profit.

3.4 KEY PEACETECH TECHNOLOGIES

Why then are fitness watches relevant to PeaceTech? Fitness watches give us a fairly simple way to understand how new technologies work in real life. Understanding how they work, where and how they process and link data, what types of capacities and infrastructure support them, and what types of further digital transformation they then trigger, is important to using digital technology wisely in a live conflict. Conflict creates tech challenges relating to infrastructure, security, and capacity issues. Using technology to end conflict is more complicated than using it to measure running.

Trying to use digital innovation for peacebuilding involves knowing something about the difference between ‘the Cloud’, and ‘the edge’, or between artificial intelligence and machine learning, or GPS and GIS. Technicians supporting PeaceTech will use these terms lightly and quickly. You will have to trust them to do their work, but you will need some technological understanding to contract the right skills, write clear work specifications, negotiate lower costs, push for faster timescales, or interrogate the adequacy of security of digital products in particular conflict contexts. Conversely, technical experts will ideally have some commitment to understanding your peacebuilding imperatives and constraints.

PeaceTech also has to be pursued with awareness of its relationship to a wider moment of digital transition that is happening at high speed. Digital transformation is driven both by business interests and ongoing technological innovation. Business courses on digital transformation often map the key technologies and consider how they drive change. These courses are designed to help businesspeople understand how to support digital innovation and gain competitive advantage. I have found these courses very helpful in seeking to ‘do PeaceTech’ better. They tend to cover the digital transformation technologies the fitness watch example illustrated.

These are the technologies that have had traction in the PeaceTech field. We can bundle PeaceTech practice into different types of activity that centre around a particular transformative technology while drawing on others. While it is impossible for any PeaceTech book to stay up to date, innovations based on these core technologies are likely to persist and evolve as the technologies evolve, as the watch-to-health-wearable example illustrated.

I set out the bundles briefly and explain how they connect to the chapters in Part II.

Peacebuilding Technology Hacks: Mobile and Cloud technology to produce practical peacebuilding tools often for local communities, to support any peace process. PeaceTech has often worked to support ‘app-isation’ of peacebuilding support tools (that is, turning ways of doing things into usable phone apps); gaming, used as a mechanism of trust-building, communication, and even data collection; and other forms of digital consultation that are crucial to peace processes. Distinctions between edge computing and cloud computing become important for low-bandwidth communities because they enable some things to be done without being online, with data uploaded in moments of connectivity. Edge-cloud decisions also have implications for personal security, for example, if sensitive information is collected on personal devices and needs transmitted off them to protect the user. We will consider the ways that PeaceTech offers new ‘hacks’ to analogue peacebuilding modalities in Chapter 8.

Remote sensing and Geographical Information Systems (GIS). Geo-coded spatial technologies, for example geolocation of data, satellite imaging, remote sensing, and drones, are now used for different PeaceTech applications, including, for example, Conflict Early Warning Systems (CEWS) that alert people to conflict. Interestingly, the use of satellites and drones are often left out of business courses on digital transformation because neither technology is germane to marketing. These technologies may also seem to be more associated with conflict than with peace.

Yet, GIS provides important ways of mapping conflict such as troop movements and rises in conflict events such as killings. This data can be fed into machine learning to predict and prevent future conflict. Once only available to militaries, CEWS are increasingly being used by the political and peacekeeping missions put in place to implement peace and transition agreements. We consider GIS, remote sensing and space technologies further in Chapters 10 and 11.

Peace Analytics: Data analytics, involving real time analytics, and big data. Data relating to conflict events or to peace, political stability or democracy, is now part of PeaceTech (as our own PA-X Peace Analytics (2025a) illustrates). Monitoring conflict, creating dashboards on conflict drivers (such as poverty), and trying to map moves away from conflict over time, for example by measuring ‘peace impacts’, are all key to

supporting peace agreement implementation. PeaceTech now draws on diverse data sources such as population-wide analyses of social media feed from platforms such as X/Twitter and Facebook to understand perceptions of both conflict and peace process. This data can be used to understand perceptions on peace agreement proposals; to engage in strategic communications around a peace agreement initiative such as a referendum; or to combat the types of disinformation and hate speech that seek to undermine peace efforts. I consider peace analytics further in Chapter 12.

Artificial Intelligence and ‘Generative AI’. Many of the above examples use forms of AI. In particular, conflict early warning systems use traditional or ordinary AI to predict conflict, and AI can supplement peace analytics. Artificial Intelligence is now also used in PeaceTech applications, for example, to enable CEWS, to monitor social media, to change minds, or to deal with large-scale documentation. We examine these uses and their challenges in Chapters 13 and 14.

3.5 CONCLUSION

It would be remiss to discuss fitness watches, transformative technologies, and PeaceTech applications without pausing to note the challenges. Technological change is now happening at exponential speed, propelled by AI. Whether the pace of technological change will stall, be sustained, or speed up further, is unknown. Like businesses and digital providers, PeaceTech entrepreneurs struggle to constantly adapt to the pace of ongoing digital change. While the potential of new technologies is immense, they can be difficult to integrate into existing peacebuilding practice. How can a digitally transformed practice of peacebuilding be incubated from the middle of such chaos?

Peacebuilding has traditionally been seen as a personal and professional practice. That practice involves restoring trust between groups, changing perceptions of the ‘other’, and persuading international organizations to offer institutional and financial support. PeaceTech literature typically considers what technology can add to this repertoire, and when and how might it help people to ‘peacebuild better’. Digital transformation should not be an end in itself. It should add value.

It is therefore important to understand what drives people to use digital tools to innovate in peacebuilding endeavors. In the next two chapters we examine PeaceTech’s connection to the closely related fields of development, democratic deliberation fields, humanitarian assistance, and

even war. We also examine the drivers of PeaceTech and the value it seeks to add to peacebuilding practices.

Questions

1. In what ways do you notice you are in the middle of a ‘digital revolution’?
2. What advantages does it bring?
3. What concerns you about it?
4. Is digital transformation a ‘Global North’ thing?
5. What type of capacities do you think the different technologies need?
6. Find three PeaceTech examples, and try to work out which of the above technologies were involved.
7. Could you rank which capacities are easy to acquire, and which are hard to acquire?
8. How much do you need to understand how the technologies work to use them for PeaceTech?

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CHAPTER 4

Locating PeaceTech

Abstract This chapter examines what it means to put ‘Tech’ on the end of a word, and examines where PeaceTech sits with relation to other ‘SomethingTechs’ that are also part of the digital revolution. I suggest that digital transformation of peacebuilding connects to digital transformation in the closely related areas of humanitarian intervention, deliberative democracy, security, and even war. Each of these areas focuses on similar conflict-affected populations, using similar digital tools and techniques, to stage different interventions to address the same crisis. The areas of humanitarian intervention and deliberative democracy support, and aspects of security provision, closely align to PeaceTech in their underlying value-systems and goals. The area of war does not.

Keywords SomethingTechs · Humanitarianism · Development · Security · WarTech

4.1 PEACE TECH AND OTHER ‘TECHS’

How does PeaceTech relate to the wider digital revolution of which it is a part? Where has ‘PeaceTech’ come from and what connections does it have to other tech innovations in conflict-affected states?

If some of the technologies have been with us for a long time, why the new term ‘PeaceTech’? New terms are usually coined to indicate that

something new is going on. This has been true of the trend of adding ‘Tech’ to other words. New technologies and capacities are impacting distinctively on many spheres of life. These spheres are core to how we order life, like financial services (FinTech), or ownership of property (PropTech), or how ‘public goods’ are delivered, such as healthcare (MedTech), or even democracy and government itself (GovTech). In many of these areas, what I term a ‘SomethingTech’ word tries to capture the ways in which the use of digital innovation is not just changing how particular tasks are undertaken but is transforming what we understand as the scope and potential of the business practice (Nathany, [2021](#)).

‘SomethingTechs’

FinTech: financial technology, involving the use of innovative technologies applied to the financial industry. Fintech includes mobile payment apps, cryptocurrency based on block chain, mechanisms for spreading payment such as Klarna, forms of credit checking, and electronic share trading platforms. (Fintech Weekly, [2023](#)).

PropTech: ‘all the tech tools Real Estate experts use to optimize the way people buy, sell, research, market, and manage a property. These innovative technologies are also known as Real Estate Tech, Retech, Realtech, CRE Tech depending on which lens you’re looking through. However, at its core, prop tech always means robust alignment between real estate and technology’. (Ascendix, [2023](#)).

GovTech: ‘GovTech is a whole-of-government approach to public sector modernization. It emphasizes three aspects of public sector modernization: citizen-centric, universally accessible public services, and whole-of-government approach to digital government transformation.’ (World Bank, [2025](#)). It can include AI chatbots for government inquiries and online portals for public services or procurement of services.

MedTech: a combination of medical technology and healthcare interventions.

ClimateTech: ‘Technological solutions that mitigate the impacts of climate change and build resilient communities’ (Reichert, [2020](#)). ClimateTech can involve sensors in the ground that measure

flooding or water quality; geographic information systems that forecast climate-related weather events such as storms; and AI that monitors, models, and predicts climate effects.

WeddingTech: Is this a thing? New smart rings can now be purchased as wedding rings that transmit couple's heartbeats to each other. Really! (Cassidy, [2023](#)).

Putting 'Tech' on the end of a word to create a SomethingTech often points to two dynamics:

- a new use of technology that fundamentally changes how the business is done in ways that create new capacities, but also disrupts previous ways of working;
- a new fusing of human and digital capacities that blurs the distinction between the human and the digital and blurs organizational boundaries previously associated with different activities

Both dynamics can also be seen in the label 'PeaceTech'. The term signals innovative use of technology and fusing of human and digital capacities.

4.2 SYNERGISTIC TECHS

PeaceTech has its own 'SomethingTech' relationships. It can be understood to intersect with spheres of digital transformation in closely related areas. These areas are tech use for humanitarian intervention (HumanitarianTech), tech used in development intervention (DevTech, sometimes understood as a dimension of GovTech), tech-based security interventions (SecTech), and what I term 'WarTech' as the use of technology to transform the art of war (see Fig. [4.1](#)).

The synergies between these domains of digital innovation are three-fold. First, all of the above 'tech' innovations come to bear on the same populations and geographies affected by conflict, often addressing the same inter-related problems but with different goals in mind—peaceful co-existence, meeting human needs, or providing for democracy or security. Second, the suite of innovation tools is virtually identical across each area—often the same type of tool and intervention drives innovation in

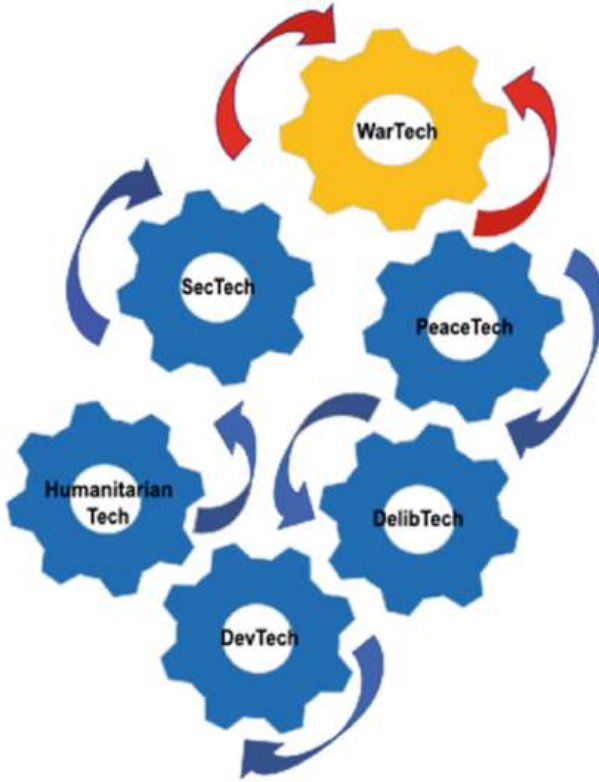


Fig. 4.1 PeaceTech Gears

each area. Third, the subject matter of each area is close to that of the others. Those in the field often talk about ‘the HDP triple nexus’, that is the interlinkage between humanitarian, development, and peacebuilding interventions and actors (see International Council of Voluntary Agencies, [n.d.](#)). This triple nexus recognizes the ways in which conflict causes humanitarian crisis and longer-term development and social justice needs that if not met continue to operate in a cycle with the conflict. PeaceTech draws on and is connected to digital innovation in the humanitarian and development fields, with processes, tasks, and digital tools that overlap.

Also overlapping with PeaceTech is digital transformation in the security and war sphere. Military use of force, whether to initiate, defend

against, or contain conflict, addresses the same populations and geographies, and uses similar types of digital innovation, often alongside humanitarian, peace, and development interventions. As with these areas, pursuing war involves understanding where violence is taking place and responding to it, utilizing strategic communication with local populations, early warning systems, and providing data-driven logistical support to move people and goods in a complex and violent geo-politicized environment. These tasks are carried out often using the same tools and techniques as PeaceTech, as illustrated by a fuller discussion of each.

4.3 HUMANITARIAN AND DEVELOPMENT TECH

Humanitarian organizations have embraced digital transformation to support provision of humanitarian relief. Humanitarian relief responds to the fallout of violent conflict but can also involve forms of peace mediation. The International Committee of the Red Cross/Red Crescent (ICRC), for example, has a digital innovation commitment, which includes using a range of technologies such as: AI, Chatbots, voice recognition, robotic automation, new digital platforms, crowdsourcing, GIS, drones, open-source software, and mobile apps. Their ‘Redsafe’ platform, for example, provides a web and app interface for vulnerable communities to access humanitarian aid (ICRC, 2025), while ‘Pomelo’ provides a new AI model and innovative data platform for population mapping in areas without an accurate census (see Mandefro, 2025; Metzger et al., 2022). Increasingly, the logistics of relief delivery relies on online information systems that can track supplies and warn of armed checkpoints and conflict incidents on routes. HumanitarianTech is now critical to humanitarian responses to conflict with platforms that are similar to the ‘situation analysis’ platforms used for peacekeeping (see further Chapter 10). The ICRC and other humanitarian organizations often engage in forms of peacemaking diplomacy or negotiation. The ICRC, for example, must negotiate with conflict parties to ensure safe passage of humanitarians or civilians, protection of civilian spaces such as hospitals, or to get access to check the welfare of prisoners and detainees, or arrange for their safe release or exchange. While not focused on the overall resolution of the conflict, these negotiations are important and often result in ‘deconfliction’ micro-peace agreements, focused on achieving these humanitarian goals.

HumanitarianTech often involves new forms of partnership that are now mirrored in PeaceTech. Mercy Corps (2025), a large development organization focused on humanitarian relief, provides an example. Mercy Corps built digital transformation into its core ways of working, developing new capacities by working with Cisco, a major business that ‘offers an industry-leading portfolio of technology innovations’, to support ‘networking, security, collaboration, cloud management, and more’ to ‘help to securely connect industries and communities’ (Cisco, 2025). Mercy Corps developed a five-year partnership with Cisco ‘centered on delivering humanitarian aid and development assistance faster, better and to more people around the world by accelerating digital solutions’ (Mercy Corps, 2023). Cisco engaged in this partnership due to its corporate social responsibility ethos, and a commitment to use its capacities and philanthropy to support a range of partnerships with non-governmental organizations that we could broadly associate with humanitarianism and peace.

The Mercy Corps/Cisco digital innovation programme has supported development tasks such as: automated reporting systems to streamline operations; civic online forums that seek to improve inclusion of local people in development planning; using social media scanning to combat COVID-19 disinformation during the pandemic period; and providing for digital cash and voucher assistance. These tasks overlap with peacebuilding tasks.

4.4 DEMOCRACY AND DELIBERATIVE TECH

A range of technology tools are emerging to support deliberative approaches to government as a way of building trust across divided political positions to support peace, democracy, or civiness. DeliberativeTech has conceptual roots in the wish to reinvigorate contemporary democracies, to move from a focus on institutions and processes, to ‘reimagine and deepen the role of citizens in governance processes by increasing opportunities for participation, deliberation and influence’ (Elstube & Escobar, 2019, p. 11). DeliberativeTech has digital innovation roots in ‘pro-social’ approaches to tech design that we touched on in Chapter 2 (see eg Schirch, 2024).

DeliberativeTech is closely related to, and sometimes understood as, a form of peacebuilding in practice. Encouraging deliberation can address some of the roots of violence occurring as social condition, in both

conflict-affected and ‘peaceful’ states. Forms of deliberative technology are used as part of the PeaceTech repertoire, as we will see in our consideration of AI in Chapters 13 and 14. However, it is worth noting the strong link between the concept of deliberative tech and processes of democratic renewal and responsive government in stable democracies (see Albrecht, 2025). DeliberativeTech can involve a wide variety of tools—online tools for large-scale ‘listening’ in polarized societies coupled with AI driven insights and modalities of tech-driven engagement to ‘change minds’ (for tool-mapping see generally DeVerna et al., 2025). DeliberativeTech tools can enable forms of constrained interpersonal or inter-communal dialogue between people of very different views (see eg., Remesh, 2025). For example, Alliance for Peace together with the PeaceTech and Polarization Lab, Kroc Institute, Notre Dame, used the Remesh platform to explore common ground between Israelis and Palestinians (Kroc Institute for International Peace Studies, 2025a).

4.5 CYBER SECURITY AND SECTECH

War is increasingly fought not just conventionally but in cyber space, and forms of cybersecurity are being developed to support actors trying to promote civiness as a counter to war. The point is illustrated by an interesting digitally focused Canadian non-governmental organization SecDev Foundation (2025a). To give a flavour, one SecDev initiative during the conflict in Syria was ‘SalamaTech Syria’ (SevDev Foundation, 2025b). This project responded to the reality that

The Syrian conflict is the first protracted war to be fought on and through the internet. All actors use the internet to organize, plan, and share information; some use it to document human rights abuses and bear witness; others use it to propagandize, collect intelligence, sow fear, and win followers. Now, as the conflict drags on, many use it to maintain family and social connections, continue formal education, and learn new skills for the future.

The Syrian social media space has been dominated by the voices of militant actors. Social media is used as a weapon of war. By contrast, the voices of Syrian non-violent actors have been drowned out by the noise of violence and extremism. To the outside world, the concept of Syrian civil society has been largely reduced to that of powerless “refugees.” SalamaTech has been working hard to correct this. (SevDev Foundation, 2025a)

In response, SalamaTech provided very practical tools to help Syrian civilians stay safe and stay connected. These included: emergency tech support to Syrians who had been arrested or had their accounts hacked; digital safety audits and ‘real-time remediation’ for Syrian civil society organizations; and Digital Technology First Responders who provided in-person and remote training to empower women and youth to become active drivers of peace and development.

A board member and founder of SecDev is Rafal Rohozinski, Principal of the SecDev Group (2025) and CEO of Zero-Point Security (2025), whose core for-profit cybersecurity work overlaps with the mission of SecDev the NGO and projects such as SalamaTech. SecDev Group provides not just cybersecurity, but also wider ‘thought leadership’ in areas such as cyberwarfare. Rohozinski himself has a diverse set of professional connections between security services, cyber initiatives, international organizations, diplomatic initiatives, and universities (Centre for International Governance Innovation, 2025). In Chapter 7 we will come to understand the PeaceTech ecosystem that Rohozinski is a part of and builds through these connections.

4.6 WARTECH?

Some of the incentives of WarTech are similar to those of humanitarian, Govtech, and PeaceTech fields—namely to enable people to operate in conflict zones with security, to work efficiently, and to reduce costs. War is often driven by humanitarian and development challenges, but of course also creates them.

Digital innovation has been central to warfare well before what we understand to be the digital revolution. Use of technology has transformed traditional forms of warfare in ways that change the relationships between combatants (think of drone strikes) and has also raised new challenges for protection of civilians because it can lead to the civilian-combatant distinction being ignored. Digital innovation has been used to take bombs into the realm of ‘smart bombs’, and other forms of ‘lethal autonomous weapons systems’ (LAWS). These systems see bombs make decisions as to where to go and who to target sometimes with minimal human involvement (UN Office for Disarmament Affairs, 2025). LAWS can work without AI, driven by pre-set parameters for when bombing or firing takes place. However, use of AI can enable automated identification, recognition and targeting of people, infrastructure, and objects using

technology such as GIS, sensors, mobile phone signals, satellite imaging, thermal imaging, and face and object recognition software.

LAWS include drones, which can be bought from military companies, but also made relatively simply and cheaply by ‘converting’ non-armed drones into armed ones. Forms of cheap converted drone have been used by states such as Ukraine (Yavtushenko, 2025) and non-state actors, for example the Houthis in Yemen who have used drones to attack ships in the Red Sea at low financial cost with little risk to their own combatants (Conflict Armament Research, 2020). In a digital innovation paradox, experimentation with AI, facial recognition, and other personal data by Israel in Gaza has led to a revival of the ‘dumb bomb’ as a relatively cheap way to destroy houses containing alleged combatants, often along with their families and other civilians in the building. The return to the dumb bomb is due to targetting of individuals identified entirely through machine learning algorithms and with a high ratio of what civilian-to-combatant casualty is permitted (Human Rights Watch, 2024b, p. 66).

These types of WarTech all rely on structured data (for example, in excel sheets) and unstructured data (for example free text or images) and an additional new technology of ‘robotics’—use of intelligent machines that can perform tasks autonomously. Robotic applications also now include unmanned aircraft and submarines. New WarTech has created challenges for current humanitarian law provision for protecting civilians in war, prompting calls to update international law (see for example discussion in Bhuta et al., 2016). Paradoxically, PeaceTech often relies on uses of technology that we associate with war. Peacekeepers, for example, are increasingly using satellites and drones for peace process support, in a search for ‘better intelligence’ for peacekeeping missions. We will consider the implications of PeaceTech’s appropriation of WarTech further in Chapter 11.

WarTech can be understood as not just another domain of digital transformation, but as a key site of digital experimentation and innovation that drives digital revolution in other domains. There is some evidence that war is now being pursued not just for goals such as territorial gains, or access to resources, but to make digital innovation gains. At the least, war zones provide a fruitful if disturbing site of experimentation. Human Rights Watch has documented digital innovation in Israel’s war with Hamas in the Gaza Strip, in which it trials new technologies in particular with regard to targetting and evacuation (Human Rights Watch, 2024a).

WarTech innovation is always driven by a desire to win the ‘arms race’. The entwined business and political ambitions of governments and companies are always bigger than winning the particular war in which the experimentation takes place. These ambitions include winning the digital race by gaining superior capacity to wage wars, securitize populations, or simply make money.

It is important to understand that the practice of war has always been deeply entwined with developments in military technology, and experiments in using it. Writing nearly a century ago, in an epic two-volume historically comprehensive study of war, Quincy Wright identified technological development as a major driver of war (see Wright, 1942, pp. 291–238). He set out four ages of war characterized by key military technological developments—a kind of military ‘industrial revolution’ story, if you will. These ages and their technologies were: adaptation of firearms, gun powder etc., 1450–1648; professionalization of armies tied to defensive building innovations, 1648–1789; capitalization of war tied to conscription and naval and steam power developments that enabled mass transportation of soldiers, 1789–1914; and, totalization of war using aerial and tank warfare, 1914–1941 (when Wright concluded his Study). We could then add the post-1945–1990 period of the Cold War as an age in which war or its absence was defined by the development of nuclear bombs, and the experience of their ‘trial’ in 1945 on Hiroshima and Nagasaki which demonstrated at great human cost the capacity for mutually-assured-destruction that underlay the subsequent age of détente.

Our current war epoch is defined by the digital industrial revolution, which has continued and accelerated the somewhat hidden dynamic of war as a driver of innovation. War brings strong incentives to digital innovation, which is enabled by easing of regulation and ethical oversight, by provision of vast sums of money often with fewer controls or scrutiny, and by political permission for experimentation, all of which scale in response to an assertion of a state of emergency. War is a domain in which arguments for exceptionality often apply and gain political support, even from governments formerly adhering to human rights standards. Arguments of war-time exceptionality mean that data collected for other purposes can often become used for war purposes, even when earlier commitments have been made that security purposes will not be permitted. The power of war means that digital transformation in other domains, including PeaceTech, needs to be pursued with an approach to ethics that not only reviews the

proposed application, but also anticipates its possible repurposing for war in the future. These issues are addressed further in Chapter 16.

4.7 CONCLUSION

PeaceTech like other ‘SomethingTechs’ is a form of innovation that changes what the core business, in this case peacebuilding, is. PeaceTech exists in a relationship with other ‘CognateTechs’ that coincide within conflict-affected countries, namely digital innovation with reference to humanitarian relief, development, democracy-renewal, security provision, and warmaking. These CognateTechs are often deeply intertwined in conflict contexts. However, often interventions in HDP triple nexus spheres take place against the backdrop of use of force, whether ongoing national or local conflict, or the permitted use of force by international forces. In practice there is therefore a quadruple nexus between the three HDP areas and military force or war. In our current world digital transformation is reshaping each domain in an ongoing way, often using similar techniques and technologies, and sometimes with the same providers and companies involved in all four areas.

The next chapter turns to consider the specific drivers of innovation in the PeaceTech domain.

Questions

1. Can you think of other SomethingTechs?
2. Why do we talk about new ‘Techs’?
3. Do you see the areas of humanitarianism, development, peace, and war as related?
4. In what ways do you see war as driving innovation? Which drives digital innovation more: war or peace, or business interests of profit making?
5. What different ways are there to ‘locate’ PeaceTech?

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CHAPTER 5

PeaceTech Drivers

Abstract In the business world digital innovation has to produce ‘value’. Value is anything that improves how the business operates and the profit it can earn, whether by reducing jobs, increasing efficiency or productivity, increasing customer numbers, or improving marketing to existing customers. What then are the drivers of PeaceTech? This chapter sets out the main drivers of PeaceTech and considers the ‘value’ technological innovation adds to peacebuilding practices.

Keywords Value · Efficiency · Creativity · Shiny · Global south

5.1 DRIVERS OF DIGITAL INNOVATION: VALUE

What ‘value’ does digital innovation add to peacebuilding? Let’s pause and consider why businesses adapt to embrace digital innovation to help us examine what the drivers for PeaceTech might be. The new technologies outlined in the last chapter drive change in a number of different ways because they add value to the business. Value is the underlying driver of digital innovation in business, understood as anything that creates a better, more productive business with improved goods or services, and profits.

New technologies enable companies to deliver a better product to their customer. For example, new and improved fitness watches give

people a range of options that their ordinary watch never could. Hence the label ‘smart watches’.

New technologies enable businesses to be efficient. They can help streamline internal production and marketing, making businesses more agile and efficient. New data systems can help track where products are in a delivery supply chain to make delivery faster. Data crunching can help companies predict when demand for their product might increase, for example, fitness watch demand at Christmas and New Year. Manufacturers can then ensure they have sufficient stock in the right warehouses to sustain timely delivery.

New technologies increase business opportunities. For example, data analytics might be able to identify which types of people are regular customers and where a customer base could be expanded to a new demographic, or when new products could be sold to existing customers—for example, new fitness watches with additional health functionality.

In each of the SomethingTechs set out in the last chapter, the drivers of digital innovation also include value relating to the specific SomethingTech field. For example, where governments engage in GovTech they do so to improve services to the public. A planning portal may help people track planning applications, or an app may help people pay public utilities bill. Innovative dashboards may improve the transparency and responsiveness of government, for example, by surveying people on future plans or letting them see where their taxes have been spent. Efficiency of some government processes may be improved, for example, because electronic forms of bureaucracy can be automated, reducing the need to employ people to enter data manually. GovTech therefore has distinctive drivers of change that connect to a particular set of relevant digital transformation technologies.

5.2 DRIVERS OF PEACE^{TECH}

What then are the drivers of PeaceTech, as digital innovation relating to peacebuilding? What value does PeaceTech add to the practice of ending wars? I suggest the following main drivers, all of which relate to forms of ‘value’.

5.2.1 *Creativity-At-Work*

PeaceTech has partly emerged because peacebuilding is a creative practice, and digital innovation adds new people and capacities to the creative mix in ways that are understood to benefit the practice. Different types of peacebuilding look very different. The practice of negotiating ends to conflict, such as through a peace agreement, can look like high-level diplomacy between governments and international organizations. Ordinary people can get a bit lost. This type of diplomacy still requires elements of creative practice. However, at the level of the everyday conflict, peacebuilding is often a more holistically creative enterprise of bringing people, ideas, activism, and communication together to displace violence. John Paul Lederach's wonderful book *The Pocket Guide for Facing Down a Civil War* (2024) points to the ways that peacebuilding involves many different actors who, like bees in a colony, self-organize often without ostensible cooperation. They move through conflict landscapes setting down and picking up peacebuilding tasks to create a form of silent joint enterprise, as the stories of Atem and Aker illustrated. Local peacemakers create what Lederach calls 'pocket peace' in their area. Over time they can connect pockets to stop local conflicts connecting to involve national conflict.

Digital transformation has been driven not just by business and profit, but by creative industries such as gamers, artists, and visualizers. There is perhaps a natural creative tendency of peacebuilders because peacebuilding is itself a creative practice. The commitment to creativity is a point of synergy between tech and peacebuilding. Some examples illustrate what happens when this creativity collides.

Butterfly Works (2025a) is an Amsterdam-based social design studio 'pioneering the use of co-creation and design thinking in international development'—interestingly with a predominantly female team. As part of a GIZ (German Agency for International Cooperation) peace initiative on Yemen, it worked to co-create games with Yemeni designers. Arabia Felix is a series of six mobile games designed to inspire users to strive towards peace through quests, treasure hunts, puzzles, and decision-making challenges (for the story more fully, see Butterfly Works, 2025b). The games can be downloaded and played in both Arabic and English on Google Player (Google Play, 2025).

The project shows different forms of creativity at play: co-creation from Global North and South (albeit as a Northern-led initiative); digitally

connecting young people from different locations who otherwise could not meet; designing peace games that challenge war games as a genre; and a creative attempt to gently challenge attitudes. Within two years the games had 40,000 downloads.

Arabia Felix means ‘happy or flourishing Arabia’, and in ancient geography was the comparatively fertile region in southwestern and southern Arabia that included Yemen. It contrasted with Arabia Deserta—barren Arabia—and Arabia Petraea—Stony Arabia (Encyclopaedia Britannica, 2025a). So even the game’s name navigated the complex divided history of Yemen and its changing borders.

5.2.2 *Lower Risk to Fund*

Supporters of PeaceTech may have turned to digital innovation because it enables them to ‘do good’ in new more effective ways. Philanthropy—money donated from business to do ‘good things’—has often been a bit wary of supporting activities that can seem ‘political’ such as peace-building, which it tends to understand as something that only takes place in extreme conflict (Knight et al., 2020). Similarly, people we may think of as purely profit-focused, such as venture capitalists who invest somewhat experimentally in businesses they judge may scale to make a big profit, or investment bankers that invest other people’s money to make interest, or other tech-focused companies selling wares, may have business reasons to support PeaceTech. Businesses will often also have Corporate Social Responsibility (CSR) requirements that require them to dedicate some of their business to ‘doing good’ (see Posner, 2024). Sometimes the moral commitments of founders and CEOs, or the close connection between PeaceTech and the nature of their business, will see the company engage in some sort of social-justice intervention alongside their efforts to make money.

These financial entrepreneurs often support PeaceTech as a way of being seen to ‘do good’ and of trying to do good. For all these funders of PeaceTech, funding technological innovation related to peace may be less high risk than funding peace interventions themselves.

Companies may also get involved in PeaceTech because they can add value to business and to the world, by connecting the businesses they invest in to support PeaceTech projects. The new European University Institute (EUI) Global PeaceTech Hub (EUI et al., 2025), for example, is supported by Kluz Ventures (2025a), which also supports

an annual PeaceTech prize. Kluz Ventures is a private investment firm that is ‘passionate about new technologies’. Kluz Ventures understands its investments to be about ‘long term returns across private and public markets’, but also articulates a vision to invest in companies that are in some sense changing the world in a good way (Kluz Ventures, 2025b). Supporting PeaceTech is a way of connecting companies with ‘the side of the angels’ (Nicolaidis & Giovanardi, 2022).

We may feel that ‘supporting peacebuilding’ is a nice thing and not a bit political. So why the philanthropic and business caution to fund? Think for a moment about the conflict in Ukraine that continues to rage at the time of writing this book. Many people think that fighting this war is the only way to create ‘peace’. Arguing for negotiations appears to suggest that compromise with a country that has invaded your country is a good thing. That view is controversial. Yet, in most conflict-affected countries wars are waged in the name of peace and justice, sometimes cynically and sometimes not. In fact, all sides in most conflicts claim that they have turned to war in pursuit of a just peace, and peace mediation must traverse conflicted concepts of what the war is ‘about’, as much as the conflict itself (Bell, 2000; McGarry & O’Leary, 1995).

Businesses can also be reluctant to try to change conflict contexts, whether through philanthropic giving or corporate social responsibility, because conflicts are complicated, messy and have ‘sides’ while businesses often try to eliminate unpredictability and appeal to all. Deciding what constitutes a good peacebuilding intervention to fund is not the sort of calculation businesses feel well placed to make. Plus, they may seek to do business with all sides in the conflict at some point down the road.

Supporting PeaceTech’s provision of the technological tools for peacebuilding may feel a bit safer than supporting what people might do with them in complex conflict contexts. But also, provision of tech tools is a step removed from what people do with those tools. PeaceTech funding, rather than peacebuilding funding, may feel closer to the mission and expertise of the business.

5.2.3 *Searching for Evidence-Based Interventions*

Digital innovation offers the possibility of more evidence-based approaches to peacebuilding. While the early 1990s saw peace negotiations as somewhat of an experiment, over time the practice became more structured, professionalized, and complex. Given that the practice is over

thirty years old and, as we shall see next chapter, has a patchy record of success, there is a strong wish to develop peacebuilding policy with an evidential basis. Ongoing pressure on public budgets means that funding peace processes and peacebuilding interventions brings increasing pressure to fund only those interventions that can evidence capacity to achieve their goals.

The search for evidence-based policy drives some PeaceTech initiatives, including our own. A broad range of research attempts to correlate what goes into a peace agreement with peace process outcomes, or to measure the overall success of peace processes themselves. For example, data has been used to suggest that peace processes that include women are more successful than those that do not (Krause et al., 2018). As we will see in Chapter 12, defining and measuring peace process success is not simple. Nonetheless, PeaceTech provides an expanded set of tools capable of providing an evidence base for effective peace process interventions and monitoring and evaluating their outcomes.

5.2.4 *Global South ‘Needs Must’*

Although we might think of technological development as a Global North-dominated affair, PeaceTech innovation has often been developed in the Global South to respond to pressing needs in conflict-affected countries. Necessity is the mother of invention. For example, one of the much-cited PeaceTech initiatives is Ushahidi (2025a). The name comes from the Swahili word for ‘testimony’. Ushahidi provides an online platform to crowdsource, collect, geo-code, and map information about incidents and events. It was started by tech colleagues who worked in 2008 to establish a digital platform to monitor and map the election violence that erupted in Kenya. The platform that emerged enables the rapid collection, management, and analysis of crowdsourced information.

Ushahidi has now developed a business model that sustains its work, although increasingly it is also under financial pressure. It invites donations and receives grants for projects. It offers a basic platform for free and an ‘Enterprise plan’ for bigger scale platform capabilities—a form of ‘servitization’. Ushahidi is a good example of what is called ‘re-usability’ in design model. The platform is enabled to make it capable of being adapted to other places—for example, to ensure fair elections in the

United States, Kenya, and Nigeria; documenting police brutality in Portland during Black Lives Matter protests; and helping women address sexual violence in Egypt (Ushahidi, 2025b).

Also located within Kenya and Nairobi are other creative initiatives that have a digital focus. Together, they operate to position Nairobi, Kenya at the heart of PeaceTech. For example, Build Up, a ‘peacetechnology enabler’ who we will look at more next chapter, holds key trainings in Kenya with a presence there (Build Up 2025a). Busara (2025), a Center for Behavioural Economics, is a nonprofit organization that uses social and behavioural science, including innovative approaches to data and technology, to address problems that include conflict. Busara’s project in Uganda assessed the ‘behavioural effects of conflict exposure’, seeking to understand how exposure to conflict affected social preferences, including decisions to use violence (Busara, 2020).

Even in some of the most challenging conflicts, digital innovation is evident. We worked in 2019 to explore whether it would be possible to set up a digital peace process for Yemen, in association with other partners. The work revealed multiple organizations within Yemen, often supported by Yemeni diaspora, engaged in digital peacebuilding with interesting and strong capacities. The organizations included women’s groups networking through WhatsApp and groups such as Deep Root Consulting (DeepRoot, 2025), with a strong interest and capacity in new technologies, as well as Butterfly Works discussed above and addressed further in Chapter 8. Some of the ideas from that enterprise implemented sometime later, see for example Crisis Management Initiative’s use of WhatsApp chatbots and AI, to consult with marginalized youth communities (CMI, 2025). Similarly, in Syria an audit of use of technology by activists found extensive use and innovation (British Council & Build Up, n.d.). Initiatives, such as the SecDev Foundation’s Syrian SalaMaTech example discussed last chapter, have emerged to provide layers of professional security expertise to these types of organic local initiatives.

PeaceTech has therefore some potential to support local actors to take control of their own modes of production. It also offers mechanisms to adjust imbalances of knowledge between local actors and international actors: to render the local more knowable to internationals, and to enable locals to connect to and influence international agendas.

5.2.5 *Supporting More Inclusive Peace Processes*

Peace processes have to focus on armed actors if they are to end fighting. However, these actors typically approach peace negotiations as an alternative means of achieving their battle-related goals, in forms of transactional bargaining. Often citizen needs of the process will be broader and more linked to social justice root causes. Wider social input to peace processes is necessary to the design of fair institutions, delivery of social justice, and provision of public goods such as education and healthcare. Inclusion of civic voices in the peace process therefore matters but is difficult to achieve in the midst of conflict.

PeaceTech can provide innovative ways of understanding the needs of civilian populations as regards the peace process. As the Everyday Peace Indicators project of Chapter 2 illustrated, PeaceTech offers solutions of scale for enabling the public to influence peace process outcomes. It offers access to hard-to-reach populations, and new large-scale surveying or polling of civilians on peace process options. ‘Digital inclusion’ for peace processes is a key PeaceTech development (see further, Hirblinger, 2020). Hirblinger defines digital inclusion in peace processes as meaning that ‘the voice of conflict stakeholders is integrated into that peace process in the form of digital data’ (2020, p. 10). He gives examples of Facebook consultations in Myanmar ceasefire negotiations (prior to the 2021 military coup); digital platforms for negotiations, which included capacity to upload submissions in Colombia; and offline and online consultations in preparation of the Libya National Dialogue.

Where digital tools enable people to input into peace processes, forms of machine learning now have capacity to enable views to be more quickly parsed from electronic submissions, in ways that can be quickly fed to mediators. A project in Chile for example, used natural language processing to compare respondent’s views on the priorities for the constitution, with the language of the constitution; a proof-of-concept study in Yemen demonstrated how topics could be modelled on consultation responses (Arana-Catania et al., 2022). Gen-AI now adds capacity to this type of machine learning and puts the technology in a wider range of hands, as we explore in Chapter 13.

5.2.6 *COVID Effect*

COVID-19 displaced many internationals from conflict zones as they were relocated home. It also led to lockdowns, emergency laws, restrictions on freedom of association, and an urgent need for medical supplies. COVID-19 drove a greater uptake of digital technologies as things like online meetings became a necessity, including in the peacebuilding field. COVID-19, as we will see in Chapter 9, also led to new processes practices of ‘dashboarding’ in response to the need to coordinate data relating to illness and health care. Dashboarding has transformed how data is collated so that policymakers can use it to make evidence-based decisions, and dashboards are now increasingly used to support peacebuilding activities.

COVID-related digital innovation has helped normalize digital innovation in conflict zones post-COVID. Conflicts create some similar constraints to COVID, but as an ongoing challenge rather than an exception: people stuck in places, emergency law restrictions, difficulty of travel, and being unable to meet safely in person. In 2023 for example, a new phase of conflict in Sudan led to rapid evacuation of most international staff, displacement of civilians, and many in Khartoum were suddenly confined to their houses. Key communications relating to any attempt to broker peace had to suddenly shift to remote.

5.2.7 *Global North Peacebuilding ‘Needs’*

PeaceTech also meets some needs of Global North peacebuilders and their donors. The need to cut costs, now hugely accelerated by post-COVID austerity, has seen former peacebuilding donor countries cutting aid, as they also move their own economies onto a war footing, or focus on domestic priorities. Funds for peacebuilding are now being dramatically cut while military expenditure and funding for war is rising. According to the OECD, resources for peacebuilding, which are always less funded than humanitarian and development assistance, are at their second-lowest level since 2004, with most Western countries radically cutting budgets (OECD, 2025a, p. 129). Germany, the United Kingdom, and the United States have all cut development aid funding—in the case of Germany and the UK, to build up military defence expenditure, and in the US to also reflect changed wider political priorities.

These cuts have a direct effect on peacebuilding organizations and programming. Against this context, digital ways of working seem to offer ways of continuing activities for less cost or increased efficiency. They also offer ways to manage extreme security concerns that make it difficult to be ‘in the field’ and to include populations experiencing large-scale displacement due to conflict. In Syria, for example, since the war’s start in 2011 over 13 million people have been forced to leave home, with 7.4 million internally displaced (although since the fall of the Assad government in 2024, some are returning home) (UNHCR, 2025). Peacebuilding’s financial crunch means that it is tempting to turn to digital convening of large-scale meetings of conflict-affected populations to formulate ends to conflict or use digital surveys of populations on what change they think would work, rather than meeting in person. Platforms and modalities of digital consultation that greatly improved during COVID, together with innovative apps and gaming that we consider in Chapter 8, all now offer cost-saving, scale, and personal security dividends.

Of course, digitally-supported engagement is also likely to produce different outcomes than face-to-face meetings, although it can be difficult to predict exactly how.

5.2.8 *Countering WarTech*

PeaceTech, has been significantly driven by the need to combat the rise of WarTech as the digitalization of warfare. Cybersecurity for peacebuilders in war zones has been a necessary response to use of cyberwarfare. Effectively combatting cyberwarfare requires knowledge of how it works and can be stopped, as the SalamaTech cybersecurity example of last chapter shows. When we look at PeaceTech activities across all the peacebuilding circles set out in Chapter 2, addressing disinformation and polarization has been a key activity across all three circles. Recently, Build Up produced an open-source tool for monitoring social media for hate speech and disinformation called ‘Phoenix’, which enables peacebuilders to add social media analysis to their toolkits (Build Up, 2025d).

5.2.9 *‘Shiny’ (‘Now I’ll Eat You, So Prepare Your Final Plea’)*

People are attracted to ‘shiny’ new things and want to give them a go, to see if they produce shiny new results. Why not, then, experiment with digital innovation for peacebuilding? PeaceTech exists in part

because digital innovation to improve peacebuilding practices seems to make sense. A range of quite different actors is now interested in driving and supporting PeaceTech in part because it is a ‘new kid on the block’ (CMI, 2020). The move by a range of governments to support PeaceTech has been motivated by wanting to be at the front end of innovation, as much as out of the conviction that new forms of digital innovation offer immediate improvement of peacebuilding practices.

Shiny is not bad, because innovation is not bad. Yet, there can be a downside. The more general disruption of peacebuilding that we turn to next chapter sees a push against ‘supply-driven’ peacebuilding interventions often from the Global North, rather than demand-led peacebuilding support that is responsive to the requests from activists in the Southern-based countries in which peace processes predominate. There is a danger that in the rush to ‘shiny new things’, peacebuilding’s Northern-supply-led dynamic is made worse. While reaching for innovative new tools is to be welcomed, the villainous crab on the Disney cartoon *Moana* gobbles all the fish attracted by his shine and reminds us that we should also be cautious of shiny as a reason to do PeaceTech.

5.3 CONCLUSION

In PeaceTech world, along with the above drivers of digital innovation, is the overwhelming need to respond to peacebuilding’s current moment of fundamental disruption. Conflict patterns are changing and the global order that supported the evolution of peace processes and mediated ends to conflict is changing. Funding for war is increasing, and funding for peacebuilding decreasing from the already small proportion of funds it receives in comparison to war or even humanitarian or development interventions.

Digital capacities are also constantly changing, particularly in response to war. PeaceTech digital innovation appears to offer a new capacity for new global threats that come together in what is sometimes termed a ‘poly crisis’ of inter-related war threats, climate change threats, and disinformation threats—all of which digital innovation is also intimately bound up in creating. This poly crisis creates a need to be inventive in response and so creates an incentive to use PeaceTech because it offers a possible response to challenges of cost, evidence, remote-access, complexity, and scale—a response that seems necessary in this new world.

However, can PeaceTech disrupt war when new types of conflict are currently disrupting peacebuilding? What happens when double-disruption of peacebuilding—disruption from the digital revolution and disruption from changing conflict patterns—coincide? Can one overcome the other? Or do things become doubly bad? We now turn to consider what I term ‘double disruption’ and its implications for PeaceTech.

Questions

1. Where do you think digital innovation seems useful in humanitarian, development, democracy, and security interventions?
2. What do you think are its risks in these areas?
3. Can war ever be a ‘pro-peace’ intervention?
4. Does it matter to the practice of PeaceTech if PeaceTech and WarTech innovate in response to each other?
5. Can you think of other drivers of PeaceTech?
6. How do you feel about the word ‘disruption’?

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CHAPTER 6

Double Disruption

Abstract This chapter examines how new patterns of conflict are disrupting both efforts to mediate ends to conflict and the wider peacebuilding practices that support peace processes. To be effective, PeaceTech practice must seek to add value to peacebuilding, but must do so amidst a peacebuilding crises caused by a rapidly changing conflict landscape. This landscape is one of double disruption—first disruption of peacebuilding due to changing conflict patterns in a changing global order, and second disruption from the digital revolution that has consequences for practices of war and peace. This double disruption has an impact on PeaceTech and how we use it.

Keywords Peace process · Transition · Disruption · Fragmentation

6.1 THERE'S A TRICK WITH A KNIFE I'M LEARNING TO DO

There's a trick with a knife I'm learning to do. I love this title of a book of poems by Sri Lankan-Canadian novelist and poet Michael Ondaatje (1979). I can't explain why.

The phrase is intriguing. It sounds ominous—what is he learning to do with the knife? Is he learning to cut and to hurt and be a harsher, nastier version of himself? It feels as if he could be cutting himself? Self-harming?

Cutting something out? A good something or a bad something? Or could he be cutting free, or carving a beautiful wood sculpture, or experimenting with what a knife can do in a more artistic way that subverts the darker side of what a knife can be?

I first heard the phrase from a peacebuilder called Ken Bush many years ago when we worked together in University of Ulster. He was presenting a paper on how we might decide what ‘peace agreement success’ was, and *who* should do the defining, so that we could measure delivery. He did not explain the title, but it captured how monitoring success in peacebuilding requires imposing a definition of peace to monitor against, when constructing what peace might mean in any country context is itself the object of the peacebuilding effort. Ken presented at a small expert seminar I ran in 2008 that continues to inform our efforts to benchmark peaceful directions of travel in conflicted societies by developing a Peace and Transition Process Tracker as described in Chapter 12. As with the memory of the special person Ken was, his use of the phrase has stuck with me.

I turn to the knife phrase because what we are doing with PeaceTech requires us to think about what peace is, what its relationship with conflict is, and how technology might relate to both in ambiguous ways. What trick with PeaceTech are we trying to do?

6.2 DISRUPTION

Disruption is an interesting word that appears often in discussions of the digital revolution. The ‘SomethingTechs’ described in Chapter 4 share two dynamics. First, a set of drivers of digital innovation that are distinctive to different domains of application; and second, new digital capacities that disrupt existing ways of doing business.

The SomethingTech label speaks not just to a connection between activity and technology, but to how digital innovation transforms the activity itself in ways that can have unpredictable outcomes for good and for bad. FinTech, for example, has enabled mobile banking that has shaped where ATMs and banks are located. It has also enabled new forms of currency such as Bitcoin that float freely from country monetary systems and therefore can operate outside of normal regulatory frameworks. Or faster-than-light transactions whose speed changes the nature of speculation in ways that can destabilize financial institutions. All of these changes in a sense change what money is, how it is used, and have

knock-on unpredictable effects on the financial sector, some of which seem good and some bad.

MedTech can include medical technology for handheld pregnancy tests, or old tech such as ultrasound. However, biotech advances transform how medical interventions take place and again blur the line between humans and the computing devices that can be implanted in them. Examples include the use of brain implants to address neuro-degenerative disease; nano-computers injected into blood streams to both detect and modify processes that cause disease; and robotic surgical interventions that enable surgery to take place with doctors in one country and the patient in another, in ways that globalize healthcare and the frameworks that govern it.

The word often used to describe this type of change is ‘disruption’. What the SomethingTechs have in common is that they ‘disrupt’ normal ways of doing business by providing new methods that reshape what the business delivers (remember fitness watches becoming ‘health wearables’?) As the word ‘disruption’ indicates, there is something unpredictable about where digital disruption leads.

6.3 ‘CHANGE EVERYTHING EXCEPT YOUR WIFE AND KIDS’

We tend to think of disruption as a ‘boo word’, rather than a ‘yay word’. Yet, on a closer look, whether disruption gets a boo or a yay might depend on what is being disrupted. If it is something bad being disrupted, like a cycle of violence, then we might think of disruption as a yay word. Mac Ginty (2022), for example, suggests that local peacebuilding is often an attempt to disrupt conflict, and also that conflict is sometimes disrupted by events such as a natural disaster. Interestingly, the Tsunami of 2004 in Southeast Asia helped create a renewed peace process in the conflict in Aceh, Indonesia but destroyed one in Sri Lanka, while the earthquake in Nepal led political parties to finally agree on a constitution to consolidate the peace process after years of disagreement. These examples illustrate that it is difficult to anticipate whether disruption will produce a positive or negative effect. As regards digital tools, if something good is being disrupted, such as an attempt to bridge views polarized by digital misinformation, then we think of disruption as a boo word. Indeed, conflict itself is a form of disruption of the prior status quo. If something bad

like conflict is being disrupted, for example by using an online deliberative tool to build consensus across divided communities, then we think of digital tools as ‘yay’.

In the business world too, digital disruption is viewed by some as a yay word—it presents new business opportunities that entrepreneurs capitalize on. Others view disruption as a boo word—it can appear that the new opportunities often arise because digital innovation creates a capacity to circumvent fairer, more regulated practices. Generative AI offers a recent example. It gives new capacities to companies (yay), but is trained and sometimes replicates artistic, academic, and journalistic works whose copyright was not owned or licenced by the companies creating it (boo).

Disruption can be both good and bad for businesses. For those that adapt, new lines of work may emerge that are very lucrative. Samsung is best known for phones and electronics. However, it began in 1938 as a grocery store in Korea, trading noodles and flour. Who knew?

And yes: someone actually said ‘change everything except your wife and kids’ to his senior executives. It was Korean businessman Lee Kun-Hee, son of Lee Byung-Chull who founded Samsung, then a humble grocery store. Lee Kun-Hee masterminded Samsung’s later-emerging electronics division and the rise of Samsung as the electronics giant we know today. Along the way, he was twice convicted of corruption and tax evasion but twice pardoned. I am sure that in those moments he was glad to have held onto the love of his wife to whom he stayed married until his death, although some of his children eventually sued him to get a share of Samsung in a case that was dismissed by Korean courts.

Digital disruption, however, poses a high risk for businesses—particularly if they stick to their old ways. Famously, Kodak, who held the biggest market share in cameras and film for decades, dismissed digital innovation in both. By 2012, the unthinkable had happened: Kodak filed for bankruptcy. It is one of the most famous stories of failure to respond to disruption, although even digital cameras were ultimately largely displaced by smartphones.

6.4 PEACE TECH AND DISRUPTION

Is PeaceTech disruptive? If so, how? What is it disrupting? And is it a bad or a good disruption? There are different types of possible disruption at play, some yay and some boo.

PeaceTech could be adding value to peacebuilding—enabling new or more efficient modes of disrupting conflict, and therefore better peacebuilding. The Arabia Felix games to support peacebuilding in Yemen, already mentioned, for example, encourage Yemeni children and others from different backgrounds to communicate positively by playing games online together. The games enable forms of communication between young people who cannot meet, regarding ‘peace’ in a country where even the word ‘peace’ is contentious between different groups.

Or, PeaceTech could be disrupting peacebuilding in a way that leads to unpredictable results, which means also some bad results. For example, remote connectivity might enable conflict parties to engage in peace talks where security and logistical concerns make in-person meetings difficult. However, it can also have knock-on negative effects for trust-building—something that seems to happen in a unique way in face-to-face human encounter.

So is PeaceTech disruption a yay concept, a boo concept, or something in between? EUI scholars have suggested a tendency to approach PeaceTech from two different converse perspectives, capturing an ambivalence regarding whether to view PeaceTech as yay or boo (Nicolaidis & Giovanardi, 2022, p. 10). The first ‘tech-neutral’ perspective emphasizes human agency and views tech as ‘just another tool’ that humans use in bad and good ways. PeaceTech not as yay or boo in itself, but yay or boo depending on the purpose to which it is put. The second perspective is ‘tech determinative’ and views the use of the technology chosen as determining the outcome in ways that the user did not contemplate. That is, yay or boo depending on the outcome produced. Nicolaidis and Giovanardi suggest a kind of middle ground perspective that views technology and politics as interacting to shape and reshape each other in complex and unpredictable ways—sometimes termed ‘technopolitics’ (Cf., Fritsch, 2014). Technopolitics requires staying open-minded and critically aware that any PeaceTech application involves a set of dynamic interactions that will shape whether its impact is positive or negative.

I often find that with PeaceTech, as with other areas, people also divide into tech optimists, who want to explore and embrace new technology as having new solutions for old and new problems, and tech pessimists, who look to the possible new risks and downsides. Here too a middle way is needed—a stance of critical optimism perhaps.

6.5 DOUBLE DISRUPTION

The question of whether and how PeaceTech disrupts traditional approaches to ending wars has an additional complication. As alluded to earlier, peacebuilding as a practice of actively mediating ends to conflict finds itself in a moment of fundamental disruption. Conflict is changing shape, with new forms of fragmentation and new forms of geopolitical involvement. Mediation interventions to end it are struggling to adapt in response. Peacebuilding as a practice of trying to negotiate ends to wars stands somewhat confounded.

Alongside these initiatives, digital innovation is reshaping war and to a lesser extent peacebuilding. I suggest this creates a dynamic of double disruption characterized by:

- The deep entanglement of war and digital transformation, which increasingly blurs the distinction between war and peace initiatives.
- The fast pace of change. Fast change in conflict patterns, mediation practices, mediators, and the norms-based international order are paralleled by a fast pace of change in digital innovation, particularly since the 2022 arrival of Gen-AI. Inability to mount coherent responses to both types of change, I suggest, partly explains both the strength and the scattered nature of the PeaceTech field.
- The difficulty of constraining either conflict or digital development using global norms or commitments to common values. As already noted, war itself is a central arena of digital experimentation, and so peacebuilders need to understand its digital transformation and how to address its technological aspects. PeaceTech is not just propelled by the desire for innovation, but because only tech tools appear to have capacity to deal with fast-paced conflict and technological change. Increased tech capacity for peacebuilders is now necessary to countering war's cyber dimensions.

To understand the current disruption of peacebuilding as an attempt to end wars, and its connection to digital transformation, it is useful to sketch out a short history of how peace processes and peacebuilding developed and came to this point (see further, Bell, 2017).

6.6 A POTTED HISTORY OF PEACE PROCESSES

6.6.1 *The Rise of the Peace Process*

In the last three decades, peace mediation has been directed primarily at violent conflict within states. The ‘peace process’ in its current form came into being in the early 1990s. Peace and transition processes proliferated due to three main factors relating to the end of the Cold War.

First, a rise in intra-state conflict and associated peace efforts to resolve it. Data shows that conflicts within states reached a peak post-Cold-War in the early 1990s, typified by the Balkans conflicts.

Second, alongside this spike in conflict, new possibilities for ending long-standing conflicts with geopolitical dimensions appeared to exist. Peace processes began to take shape in places like Central America that had seen conflict locked in by the tensions between West and East and the geopolitics of the Cold War.

Third, with the Cold War in the past, increased international attention became focused on conflict *within* states, and new possibilities emerged for using UN Charter tools such as peacekeeping that Cold War tensions had previously prevented. Over time a new international architecture of support for intervention, mediation, and implementation of peace agreements was built (see Bell, 2008, pp. 28–31).

A practice of ending wars through negotiation took hold, characterized by the following common elements.

Face-to-face talks between states and their non-state armed opponents. These replaced mediation tactics that sought to work with ‘moderates’ to marginalize groups using armed violence. Talks focused on tying commitments to a ceasefire to a revised more inclusive state structure involving elections.

Formalised peace or transition agreements. These saw armed opponents make public the commitments they had agreed to in formally written agreements. These agreements typically put in place elaborate implementation institutions involving a range of international actors in implementation roles as ‘third parties’, for example, on joint monitoring commissions or as international ‘guarantors’.

Governed by human rights and humanitarian law. International norms relating to human rights and humanitarian law were viewed as relevant to what was negotiated. Over time, the idea grew that they should constrain *what* was agreed between the parties, and also *the process* by which they were agreed. Tensions with the concept of mediation as a

neutral process of engagement with warring parties were worked out over time.

6.6.2 *(Negative) Peace Success*

Peace processes based on formal negotiated ends to conflict were surprisingly extensive, and surprisingly successful over time. Our own PA-X Peace Agreement Database (PA-X Analytics, 2025a) indicates that since 1990, more than 2200 peace agreements across all stages of a peace process have been signed in over 150 different conflicts. There is debate over how to measure success and what it shows, but on one estimate over 70 percent of agreements were successful in ending violent conflict for over five years—a political science threshold of success (Suhrke & Samset, 2007; Krause, 2019). Between 1990 and 2012, deaths in conflict and other conflict indicators fell fairly steadily (Vision of Humanity, 2025). Peace processes, therefore, were good at achieving reduced deaths in conflict—what we might term negative peace.

However, peace processes were less successful in building functional, stable states that could continue to transact political relationships non-violently through political institutions. They often failed to re-shape fundamental political disagreement, or delivery of good public services, or social justice, and so failed to address the root causes of conflict, which continued to stall political and social progress. These wider aspired-for outcomes are often called ‘positive peace’.

6.6.3 *New Institutions and Legal Norms*

Over this same time period, the international infrastructure to support peace processes proliferated. Peace processes were increasingly internationalized and legalized. New UN departments and units were created, for example a UN Peacebuilding Commission (2025) and a UN Department of Political and Peacebuilding Affairs (DPPA) (UN DPPA, 2025a), including a Mediation Support Unit (UN DPPA MSU, 2025b). Regional organizations also built their own peace architectures. New international legal standards addressed both the substance and process of peace processes (see Bell, 2008; Williams, 2021 for key norms). United Nations Security Council Resolution 1325 (2000) on Women, Peace and Security, for example, ‘regulated’ how peace processes should ideally be designed and what peace agreements should include—in this case by requiring

that women be included in peace negotiations and constitutional design, something that I supported over the years in numerous ways (see further Chapter 9).

States too started to support peace processes as a key foreign policy objective (Norwegian Government Website, 2025). A concept called ‘private mediation’ was born involving essentially diplomatic-type mediation interventions being undertaken by non-governmental organizations, notably the Centre for Humanitarian Dialogue (CHD) (2025a), Independent Diplomat (2025), and Public International Law and Policy Group (2025).

6.6.4 *Peace Process Unravelling*

From 2012 on, mediation as a way of ending conflict had begun to unravel. Deaths in conflict in Syria alone reversed previous downward trends. Indeed, figures across different measurements of peace all started to reverse (World Bank, 2018, p. xvii).

As a result, the practice of using peace processes to end conflict is in crisis. Partly the crisis is an internal one for peacebuilders. With contemporary peacebuilding practices more than thirty years old, the failure to deliver positive peace, and instead deliver ‘un-ending transition’ of a ‘no-war-no-peace’ nature, increasingly triggered serious introspection on the reasons for lack of deeper success (see eg., the Principles for Peace initiative (2025), and Institute for Integrated Transitions (2025), for very different perspectives).

Peacebuilders have focused on better inclusion of civic actors as the antidote. The peace process focused on getting armed actors to reach a ‘deal’ to stop the conflict. Peace processes therefore prioritized armed-actor understandings of the conflict above those of ordinary civilians and in particular women, who had always been committed to peace and working in non-violent ways. Peace processes empowered armed actors to shape the new political dispensation and take up leadership in it, in ways that proved difficult to make work over time. Yet, as better inclusion in peace negotiations was promoted, efforts often focused on increasing the representation of marginalized groups such as women. These efforts eclipsed the more difficult business of supporting a complex political project of compromise between armed actor deals required to end the conflict, and civic aspirations to address root causes of conflict and reduce the power of armed actors.

6.6.5 *Conflict and Mediation Fragmentation*

While peacebuilders focus on how an imperfect peacebuilding practice could be improved, a more profound mediation crisis has emerged. The peace process model no longer seems to map onto new conflict dynamics (Bell, 2024; De Coning, 2018; CHD, 2025b). A new form of disruption to negotiating ends to conflict has been driven by changing conflict patterns in some of the most protracted conflicts—Afghanistan, Iraq, Libya, Myanmar, Sudan, South Sudan, Syria, and Yemen.

These contexts see multiple conflicts within countries operating as a complex conflict system. Peace processes tried to mediate between them to create a new more inclusive political settlement. Peace process design was focused on achieving a deal between an authoritarian and violent state that was ‘owned’ by a dominant political grouping, and one or several major armed opponents. However, conflict does not look that way anymore. It is characterized by fragmentation, with multiple, often small, armed groups who come together in strategic alliances, and then fall apart again. This was brought home to us when we began to find and collect ‘local peace agreements’: it was sometimes difficult to judge when a local agreement was a ‘peace’ agreement because it appeared to focus on building an alliance to stop fighting between two groups, so they could unite and fight even harder against others (See, Bell & Wise, 2022; Bell et al., 2021). The current conflict in Sudan, for example, comprises a web of local, national, transnational, and geopolitical inter-state conflicts and armed actors that move easily across these levels to leverage their position (see Burke, 2023). This dynamic makes it harder to resolve conflict with an in-country mediated agreement.

As Sudan also illustrates, while peace processes evolved around conflict that was primarily ‘internal’, that is it arose mainly within state borders, conflict is today much messier in terms of whether it is ‘within states’ or ‘between states’. The conflict in Ukraine provides a further example. It is a conflict between two states—Ukraine and Russia. However, the conflict has taken place almost entirely within Ukrainian territory. A previous phase of conflict in 2014 was addressed as if it were an internal conflict in Ukraine (see eg., Ukraine, 2014). Internal dynamics in Ukraine were later used by Russia as justification for invasion in 2022.

Alongside the changing nature of conflict, peace processes have been undermined by a breakdown in the international consensus, fragile as it was, that mediating ends to war within established international legal

rules is broadly a ‘good thing’. While international organizations such as the United Nations used to have central responsibility in mediation, now a range of mediators all intervene in overlapping, competitive ways, often with motives that are unclear (Carothers & Samet-Marram, 2015). Local armed groups ‘mediation shop’ over who will mediate, and non-rules-based mediators are often attractive to conflict actors (Lanz, 2021). Indeed ‘peace mediation’ itself is now a space of geopolitical contestation where multiple parties mediate (see Peter & Rice, 2022; Hellmüller & Salayemah, 2023; CHD, 2025b).

In short, a peace process model premised on finding a government/non-state elite deal to end ‘the conflict’ no longer maps onto how conflict is conducted. Conflict in many states is better thought of as a complex conflict system involving local, national, transnational, and even geopolitical conflict that cannot be resolved by focusing on one level only. Some thirty-five years on from its inception, a profound problem of managing enduring transitions now exists and is fundamentally disrupting both formal institutionalized peacebuilding and the efforts of peacebuilding non-governmental organizations.

6.7 MEDIATION DISRUPTION AND ADAPTATION

Conflict disruption has forced mediation practices to adapt, but it has also changed who mediates and why (see generally Whitfield, 2024; De Coning et al., 2023). The mediation picture is no longer one that circles around a nationally mediated peace accord. Rather it is one of constant adaptation that has formed a messier landscape of what I have termed ‘multi-mediation’. I define multi-mediation as:

the accidental and deliberate use of multiple overlapping mediation processes directed towards the discrete problems and actors that make up a complex conflict system, with a view to unwinding key elements of that system, but with an uncertain final destination in terms of ‘peace’.

Multi-mediation has evolved not as a matter of design but as the messy reality of discrete overlapping mediation innovations that respond to conflict fragmentation with different task-focused mediation initiatives (see further Bell, 2024). The types of mediation that co-exist include:

Localised disaggregated mediation. International mediators are now more likely to be engaged in local mediation than they were, in part

because they operate in contexts where an overarching process is not possible, but also because they recognise local conflicts as part of the wider conflict dynamic. The United Nations, for example, has supported local mediation processes in Central African Republic and South Sudan, alongside support for wider attempts to produce national transitional constitutional frameworks and constitutions. Donors now regularly support mediation efforts in localised conflicts, and increasingly both regional organizations and private mediator groups support localised mediation to de-escalate emergent nation-wide conflict before it is established, or after a peace process when conflict threatens to re-ignite (see Adhikari et al., 2025).

Disaggregated issue-focused ‘mediation constellations’. Mediation innovation sees new ‘mediation constellations’ established in the form of issue-specific forums of international organizations, conflict actors, and sometimes technocrats coming together to de-escalate or unwind dimensions of a fragmented conflict. External states sometimes negotiate because key issues need urgently addressing to avoid catastrophe, and sometimes in the hope of building towards a process that might bring discrete efforts into one mediation frame. These constellations operate both in intra-state and international conflict. In Sudan, for example, prior to the outbreak of conflict in April 2023, different processes and agreements addressed the military-civilian opposition negotiation over a transitional central government on one hand and the intra-armed group negotiations at the periphery on the other. There were then attempts to connect the two processes over time, although ultimately a new phase of war broke out. In Ukraine, several different mediation constellations emerged—for example, negotiations between Ukraine and Russia as regards humanitarian corridors at the start of the war; ongoing prisoner exchange agreements, sometimes facilitated by the United Arab Emirates; a UN-brokered agreement to get grain out of Ukraine; and ongoing attempts by the International Atomic Energy Agency (IAEA) (2025), to ensure that fighting around nuclear power plants does not cause nuclear catastrophe.

One side’s ‘internal’ mediation. Multi-mediation is also generated by ‘intra-party mediation’ between actors that are understood to comprise ‘one side’ of the conflict in any loose binary description, but who in fact are a coalition of different armies and groups with varying conflict goals. These actors may have an enemy in common, but also quite different visions of the state they are trying to achieve as an alternative. They may

find it difficult to mount a common negotiating platform without prior intra-group dialogue and agreement. In Myanmar, for example, a coup by the military in February 2021 saw civilian defence forces, ethnic armed organizations, and civic actors self-mediating with forms of international support to create a National Unity Government and a common possible federal vision of the country (see Adhikari et al., 2025). In Yemen, in 2022, a Saudi-created ‘Presidential Leadership Council’ (PLC) brought together many diverse non-Houthi political and military interests into a form of interim government, in anticipation of a speculative future peace process (South24, 2025). Yet, the PLC had no shared vision for the country. Therefore, processes of internal brokering or mediation have been needed to support the PLC and help it broker relationships with the Southern Transitional Council (STC) and allies, whose leaders are also part of the PLC. These efforts all sit against a backdrop of a separate Saudi Arabia and Houthi negotiation, which in a sense deals with only one axis of the conflict system, albeit a key axis. The conflict system in practice involves multiple internal military-political actors, and multiple external states (the United Arab Emirates and Iran have also had connections to the conflict) (Tielemans, 2025).

Globalised mediation initiatives. Multi-mediation is also produced by new competitive and overlayed global mediation-dynamics (see Peter & Rice, 2022; Hellmüller and Salayemah, 2023). International organizations, regional groupings of states, individual states, and private mediators of different hues are all engaged in conflict resolution but sometimes with different goals. Their positions may change as they mediate alongside each other. For example, Saudi Arabia-Iran negotiations shifted several mediation dynamics in the region until the outbreak of the Hamas-Israel conflict, which then shifted regional dynamics again. In Sudan, an ever-growing plethora of initiatives have been launched to try to address the new conflict dynamic erupting in 2023. Normative mediators such as the United Nations can face difficult decisions as to when and how to try to stay involved with deal-making efforts. In Syria, for example, the Russia-Türkiye-Iran-Astana talks that continued from 2022 to 2024 started to displace the UN’s mediation primacy and gradually normalised the three states’ military presence on the ground. After the revolution of 2024, the United Nations had no real mediation role with regard to the transition (Beaujouan, 2024). The reality of global multi-mediation has provoked innovation in what types of inter-mediator

groups are needed and possible, to enable different types of mediators to work collectively to support peace processes (Whitfield, 2025).

Multi-mediation as alternative ‘non-process process’?

At present, eclectic multi-mediation responses to fragmentation dynamics are not a coherent alternative to the peace process. Although often supported by the mediation community, discrete initiatives tend to be seen as ‘doing one’s best’ while waiting for a proper peace process to appear. However, if no successful holistic peace process is possible, understanding how to better connect and cohere mediation initiatives may be the only process possible.

The complexity of the mediation landscape calls for different forms of negotiation intelligence, which can perhaps only be delivered with help from PeaceTech initiatives.

6.8 DIGITAL DISRUPTION

Digital technology is tied up with this new world (dis)order. When writing the first version of this book, I suggested that digital transformation was not a cause of the new conflict and mediation dynamics, but that issues such as disinformation and cyberwarfare were accelerants. Since then, developments in AI and WarTech mean I now see things differently.

In the last two years, disruptions of peacebuilding due to digital transformation, conflict mutations, and global order disintegration, have all gathered pace and now connect. The new global (dis)order is now propelled by three accelerating dynamics: the geopolitics of fragmented conflict and fragmented mediation; the arms race involving the digital transformation of war; and the power of digital tools to undo democracy within stable states. It is an order where a few largely unaccountable global tech companies now hold unprecedented power as part of the mix. Their power lies in their accumulation of data, a trend that looks likely to continue (Hao, 2025).

Digital disruption and conflict and mediation disruption all involve ‘blurring’. The disruption of the digital revolution blurs the connections between people, things, and computing, while conflict and mediation disruption blurs the relationship between conflict and peace. That is a lot of blur.

The digital revolution and conflict fragmentation are now intimately bound up in a dynamic that carries peace threats within states and between states. Paradoxically, I suggest this backdrop also propels PeaceTech. Double disruption means that peacebuilders are being compelled to be more tech-savvy. The speed of change of the field is propelling digital innovation of peacebuilding as an almost required response. PeaceTech also seems to offer some new ways of supporting the new conflict and mediation dynamics of this new world (see Wäehlich, 2024; Puig-Larrauri, 2024). These PeaceTech modalities are explored throughout Part II of the book.

6.9 CONCLUSION

The label PeaceTech is an attempt to capture a distinctive domain of digital transformation—that of peacebuilding. PeaceTech aims to disrupt war but also may carry consequences for disruption of peacebuilding that we should consider and try to manage. Yet both these disruptions occur alongside two other fundamental disruptions of peacebuilding. The first is the disruption caused by the changing nature of contemporary violent conflict, and indeed changes to the constellation of actors who now seek to ‘mediate’ in such conflicts. The second is the disruption of conflict resolution caused by the wider moment of digital disruption and the increasing use of war as digital incubator.

For me, a commitment to peace means trying to find new ways of working in this newly fragmented conflict world. In one sense the chaos drives my own instinct to explore what technology can offer to map, track, and respond to the new forces of change that seem to be carrying us in a negative direction. However, engaging in PeaceTech also involves continually asking: how do digital and peacebuilding disruptions entangle and what are the overall consequences?

What trick with the knife are we learning to do?

Questions

1. What is a ‘complex conflict system’?
2. What are the unique challenges of mediating an end to conflict where a conflict system exists?
3. Do you see links between disruption of peace processes and peacebuilding due to changing conflict patterns, and disruption due to digital innovation?
4. In what ways is the relationship between peace and conflict becoming blurred?
5. Do you see digital innovation as an accelerator of the new conflict and peace context, or in part responsible for it?

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CHAPTER 7

PeaceTech Ecosystem

Abstract This chapter examines the types of individuals and organizations engaging PeaceTech, such as local peacebuilders, international organizations, regional organizations private businesses, and nongovernmental organizations, and their different incentives for doing so. I point to new roles such as ‘PeaceTech enablers or connectors’. I examine how this ‘PeaceTech ecosystem’ structures what is produced as PeaceTech.

Keywords PeaceTech ecosystem · PeaceTech Enablers · Funders · United Nations · Corporate Social Responsibility

7.1 WHO DOES PEACETECH?

Remember the opening stories in the book. Seán struggling to distribute peacebuilding funds to local groups, to shore up (or substitute for?) a failing peace process? Atem and Warren designing an app to stop kidnappings and cattle rustling? Aker wondering how to address sexual violence? Owen in his Ivy League university in the United States, observing satellite Earth images and seeing conflict unfold?

Let us return to the stories to observe who is doing PeaceTech and why. What drives their digital innovation efforts, and what drives when and why they collaborate?

7.1.1 *Observe, first, the collective story*

The stories together illustrated how digital technologies not previously available are now centrally used in peacebuilding activities, but often in an ad hoc, unconnected, and experimental way. They illustrate the range of organizations, including both traditional peacebuilding communities and organizations who have some connection to peacebuilding even if it is not their main business. The latter can include academic researchers tracking agricultural developments or private companies such as the satellite companies, who have become involved in PeaceTech intentionally or unintentionally, say, by making their capacities open source, or taking on a PeaceTech-related job.

7.1.2 *Observe Each Story*

Each story shows a different type of peacebuilding actor with a different relationship to the conflict and any peace process. They show very different personal and organizational energies and incentives, and very different types of access to financial and technological resources for digital innovation, as illustrated by a short examination of each.

7.2 LOCAL PEACEBUILDERS

Local peacebuilders Atem, Warren, and Aker, will have perhaps a lifetime commitment to address the social troubles around them in an attempt to improve their lives, and those of their community. They will engage with both conflict and peace processes over decades but may have limited resources to work with. They will have copious high-level expertise in how conflict ‘works’ often not internationally or academically recognized as such. They will likely see the conflict less as a singular conflict but as a complex system in which types of conflict such as armed-actor violence, gender-based violence, violence against children, and the structural violence of social injustice, all operate to reinforce each other in ways that are difficult to unravel and disrupt. They will often ‘multi-hat’ in different roles and organizations simultaneously, as peace and social justice entrepreneurs.

Local peacebuilders will often understand the potential for conflict system mutations with a predictive and analytical capacity that outpaces the most advanced technology. For example, they may anticipate how

armed actors will adapt into organized criminals who run drugs or people-trade along routes they once used for arms; or how programmes to demobilize armed actors sending them home with weapons may increase intimate-partner violence against women. This local peacebuilding expertise is vital to ensuring a peace process works by connecting a narrow armed actor ‘deal’ to wider projects of social justice that over time can transform a transactional agreement into a broader social contract. However, local peacebuilders often struggle to influence international peacebuilding projects whose goals can be set around international agendas for change often focused on reform of institutions.

7.3 INTERNATIONAL PEACEBUILDERS

In contrast to the local actor, the international actor such as Seán or Conall may not ever be in the country ‘properly’ if at all. They may monitor and assess from afar, whether that is the relative safety of a gated community within a capital city or outside the country altogether. Like local peacebuilders they will often be deeply committed and passionate about peacebuilding but, ultimately, they do it as a career choice rather than a life-necessity born out of their situation.

Internationals in-country may struggle to get a sense of the huge, wide, diverse country they will never fully see or know. Their presence will be temporary, from less than a year to a maximum of around three years, although they may return for stints across a career or lifetime. They may be isolated to one part of the country, with in-person interactions with local peacebuilders and conflict parties constrained. Those outside the country will work with information about what is going on and little to no contact with people within the country unless country nationals happen to work within the international organization itself. Addressing remoteness is itself the subject of digital innovation—virtual reality has been used to sensitize remote UN staff to local contexts they work on.

All of these people and their organizations will work with things called ‘log-frames’ (setting goals and indicators of ‘success’); ‘theories of change’ (that define what they are trying to achieve); and even ‘exit strategies’ (that specify the end-goals for success at which point the international organization may leave and take its staff and resources to another conflict situation). The need to square these bureaucratic demands with international staff’s often very partial knowledge of hugely complex conflict

system (see Autesserre, 2014) will often drive digital innovation, in particular regarding collection and analysis of data.

7.4 PRIVATE COMPANIES AND PHILANTHROPY

Less visible but present in our stories were private companies. These may involve an entrepreneur who is passionate about peace or is from a conflict country. The businessperson may offer local peacebuilders the company's tech know-how directly by setting up a philanthropic wing or indirectly through a strong commitment to open-source technology that peacebuilders can access. Examples include SecDev Foundation and SecDev Group, as well as the CISCO support for MercyCorps, set out in Chapter 4. Individuals at the heart of these businesses may have originally set up business for a peace-related purpose. Or they may view peace and security as inter-related. Their philanthropic contribution to PeaceTech may well be part of a broader commitment to 'do good', closely aligned to what they understand to be the social value of their own business. SecDev Foundation's SalamaTech discussed in Chapter 4, for example, built on the cyber-risk awareness of SecDev Group to design its support to civilians in Syria.

Even without this type of deep peace commitment, businesses have a range of business incentives to engage in corporate social responsibility (CSR) activities that may drive them to contribute to PeaceTech (Posner, 2024).

However, there can also be more profit-oriented business benefits to PeaceTech, beyond those of CSR. Not-for-profit innovation in the peace-building field can build expertise for the company's business as a whole by offering a 'proof-of-concept' example of an experimental but potentially profitable technology. An offer of small-scale satellites for 'conflict early warning' (discussed further in Chapter 10) may enable its development and later purchase by, for example, a country's intelligence service. At that point the business may lose control over exactly when and how technology is used, and what ethical constraints are in place.

Other businesses may engage in PeaceTech as an element of their business offer, either as the entire offer or as a paid-for PeaceTech application of a more general technology. Businesses-for-hire may have little capacity or interest in fully interrogating conflict and peace impacts and often have to develop forms of conflict-awareness 'on the hoof'.

Elon Musk for example, famously used his Starlink satellite system (Starlink, 2025) to provide mobile broadband to Ukraine. This is a digital innovation that can ‘beam in’ internet capacity in hard-to-reach places, as Ukraine became after Russia invaded and where Starlink became particularly vital as Ukraine’s telecommunications infrastructure was targeted. There is some ambiguity as to whether Musk’s company was paid by the US government, and if so whether fully (Smith, 2022).

Even if the motivation was altruistic, being the first high-profile provider of satellite-enabled internet in places with no cables is a significant business prize. Being able to demonstrate capacity in a context such as Ukraine has a proof-of-concept benefit that can assist future commercial take-up. In fact, Jayanti (2023) documents that an initial free service was followed by a service that cost the US government an undisclosed amount. SpaceX claimed the cost of provision it was incurring was £400 million a year. The US government also paid directly for much of Starlink’s Ukraine ground infrastructure. By May 2022, a year and three months after entering Ukraine, SpaceX valuation was raised to \$127 billion and the company had raised capital of \$2 billion.

Musk and SpaceX, however, quickly encountered conflict-related dilemmas. News reports and Musk’s own tweets indicated that while he was happy for the internet to be used for civilian government, he was unprepared to have the mobile internet used to enable Ukraine’s long-range drone strikes (Sabbach, 2023). When asked about whether SpaceX had thought about this in advance, President and Chief Operating Office Gwynne Shotwell said, ‘We didn’t think about it. I didn’t think about it. Our Starlink team may have, I don’t know. But we learned pretty quickly’ (Roulette, 2023).

Musk and SpaceX may have been concerned to draw a distinction between supporting Ukraine’s defence of civilians and supporting Ukraine’s proactive war effort—particularly one that could escalate by attacking Russia on Russian soil (see Musk, 2023). Enabling civilian tasks and military ones, or supporting military defence and supporting military offence, all seem different so one can understand why a business might be happy to support some tasks and not others. However, Musk and SpaceX may also have been concerned not to be seen to be actively involved in the conflict in ways that might draw them in as targets or jeopardise a more neutral stance towards a conflict party (in this case Russia) in the future. These types of concern, of course, are legitimate, but they require

forms of conflict analysis and forms of political judgment that businesses are often not well placed or comfortable to engage in.

The story has an added layer, as a public dispute in February 2025 between the then-new US President Donald Trump and Ukrainian President Volodymyr Zelensky led to fears that the United States and Musk, as a close ally of President Trump, might withdraw the use of Starlink, or the US government refuse to support it. There has therefore been some attempt by the European Union to search for a replacement (Posaner, 2025). The incident has exposed the risks of relying on one main tech provider.

7.5 UNIVERSITIES

Universities also feature on the edge of our PeaceTech stories: recall Warren, an African student at a Norwegian University, and Owen, a North American researcher in a North American university. Both of these researchers—one a peace and conflict researcher (double-hatting as a local peacebuilder), and the other a researcher on agriculture, were able to use support from university colleagues to gain skills or partnerships that enabled them to innovate with technology.

Our own PeaceTech work at the University of Edinburgh comes out of this type of relationship as described in the next chapters.

Universities often comprise the ‘research and development’ engines of PeaceTech, developing proof-of-concept work to support peacebuilding applications. However, they can also act as conceptual developers of the field of PeaceTech and PeaceTech enablers, supporting students and practitioners to enter the PeaceTech world.

A number of initiatives centred in North American universities have been central to building both technological capacity and PeaceTech as a field of scholarly activity. These include:

Peace Innovation Lab, University of Stanford (2025). This Lab has been at Stanford since 2008, initially as a class and then a project within the Persuasive Technology Lab and eventually as its own Lab. It focuses on the connections between business, technology, and peace, with a particular mission to ‘catalyse a PeaceTech sector’. Their work lies at the intersection of behavioural psychology, technology, innovation, and business.

PeaceTech and Polarization Lab, Kroc Institute for International Peace Studies (2025). This lab is an interdisciplinary research lab

with four key areas: prosocial tech design, focused on how design and algorithms affect human behaviour; deliberative tech and democracy, exploring platforms to support dialogue and public problem solving; AI for public discourse, using artificial intelligence to support people to tackle toxic content online; and tech ethics and governance of digital public squares, advising governments on how to support prosocial technology innovation. The wider Kroc Institute for International Peace Studies also houses the Peace Accords Matrix (PAM) which provides peace agreement data and is discussed further in Chapter 12 (Peace Accords Matrix, 2025).

Beyond North America, similar initiatives exist.

Peace Innovation Institute (Hague) (2025) is not strictly a university project, but was produced as a spin-off from Stanford's Peace Innovation Lab in 2018 in collaboration with the City of the Hague. The Institute provides a focus on the relationship between peace and business, or as they put it: 'making peace profitable'. This Institute describes its mission as to 'catalyse a peace tech sector and industry' and 'create new frameworks and curriculum for the ethical and safe deployment of emerging technologies and innovation'. In particular, it is working to provide a 'Peace Data Standard' to allow organizations using technology to 'measure their peace impact in the background'. The idea is to try to address structural issues in capitalism by reconfiguring how corporate social responsibility is activated for peace by providing a credible way of measuring a company's peace contribution – a bit like 'carbon credits' in the environmental field (see Guadagno et al., 2018).

University of Ulster has had an **InPeaceLab**, with activities relating to the relationship between peacebuilding and technology.

The **EUI-based Global PeaceTech Hub** (2025a) already mentioned, was established to network academics and practitioners, as the name 'hub' suggests. It brings together EUI's School of Transnational Governance (2025), TheGovLab (2025), and the University of Lucerne's Institute of Social Ethics (2025) and focuses on exploring PeaceTech as a globalizing phenomenon.

PA-X Peace Analytics, University of Edinburgh (PA-X Peace Analytics 2025a). We work in particular to develop 'peace analytics' in the form of a new capacity to use structured and unstructured, quantitative and qualitative data to understand the ways in which peace is incubated, created, and sustained, as set out throughout this book.

The Centre for AI in Government (CAIG), University of Birmingham (2025), also undertakes work on Peace and Artificial Intelligence as core to its mission.

The Interdisciplinary PeaceTech Network (University of Bristol, 2025). This network was started by academics in UK universities, notably the Universities of Bradford and the PeaceTech Group at University of Bristol, to promote ‘skill sharing and mutual understanding across the very different fields of technology and peacebuilding.’ They define PeaceTech as ‘the multiple ways that technology is being used to advance peace and sustainability around the globe’. The organization seeks to network those engaged in PeaceTech’s different fields.

7.6 PEACE TECH FUNDERS

All of the PeaceTech projects in our initial stories needed funding, whether for PeaceTech innovations, for digital innovation, or for core work in which digital innovative practices were used. PeaceTech engages a broad array of funders engaged in supporting PeaceTech that include:

- University research-grant-giving organizations
- Donor states
- International organizations and funds
- Businesses and private philanthropy
- Venture capital investors

7.7 PEACE TECH ‘ENABLERS AND CONNECTORS’

A number of key PeaceTech organizations work as ‘PeaceTech enablers’. These are often forms of non-governmental (NGOs) or not-for-profit organizations. Their purpose is to build PeaceTech capacity and ways of working, and to develop and support good practice. The following main organizations with three slightly different missions are important and useful to understanding this type of role.

PeaceTech Lab. PeaceTech Lab and its CEO Sheldon Himelfarb were at the heart of the development of PeaceTech as a concept and a tool, in a sense as the foundational enablers. The lab began its life at the Center of Innovation at the United States Institute of Peace (USIP) (USIP, 2025b), a national peace institute established and funded by the US Congress

using a bipartisan approach. The Lab was founded in 2008 and became a nonprofit in its own right in 2014 and continued until closed by President Trump in 2025 (Johansen, 2025). While at the time of writing USIP has re-opened, it is unclear what the status of PeaceTech Lab now is, and none of its materials are currently publicly archived. This story itself bears witness to the paradoxes of the current moment of double-disruption: PeaceTech was dismantled at a point when the US was seeking to engage more directly in peace negotiations as part of its global ambitions.

When PeaceTech Lab clearly existed, its mission was to drive ‘action-oriented solutions by bringing a diversity of experts together: data scientists, social scientists, engineers, MBAs, global influencers, media ambassadors, and creatives’ to ‘collectively develop effective peacebuilding solutions’. This work has been incredibly diverse. PeaceTech Lab had programmes on digital challenges to peace such as misinformation and hate speech. However, it also ran a ‘PeaceTech accelerator’, that helped support PeaceTech start-ups in particular with secure access to cloud computing but also by offering workshops on easy-to-use Tech for peace-builders, as well as a master’s degree programme. It also supported similar labs in other countries, although their existence now also seems uncertain.

Build Up (2025a). An interesting connector organization, Build Up is, in its own words, ‘a global non-profit that works beside local organizations, to identify and address emergent challenges to peace through interventions, research and training, that combine best peacebuilding practices, participatory methodologies and digital technologies.’ This statement speaks to double disruption, in viewing new technologies as capable of responding to a shifting peacebuilding field, in which digital transformation may also be a threat. One of its programmes relates to digital conflict, and another to participation or inclusion in peacebuilding.

Build Up

- enables local groups to access technological capacity and funding for innovation
- supports innovation in peacebuilding
- provides tools that enable groups and individual to use technology even where they have few technical experts
- provides thought-leadership on the principles and values that should underpin PeaceTech.

Its work is critical to plugging some of the ethical gaps we address in Chapter 16 by providing guidelines for good practice.

New York University, Center on International Cooperation (NYU CIC, 2025a). NYU CIC is a non-profit centre housed at New York University and that focuses on policy connecting politics, security, justice, development, and humanitarian issues. This organization has had a focus on data and worked as PeaceTech-enablers, convening broad PeaceTech events and leveraging a strong connection to the United Nations, whom CIC works to support.

AI for Peace (2025). This is a relatively new organization that exists to support ‘constructive dialogue and engagement between academia, industry and civil society’ with a view to ‘maximizing the benefits and minimizing the risks to human rights, democracy and human security’ of artificial intelligence. It does this through a form of new service, circulating updates on AI, producing publications on the use of AI for peace (see Panic & Paige, 2024), holding events on AI and Peace, and supporting other AI and peace initiatives. AI for Peace has five focus areas regarding use of AI: humanitarian action; human rights and democracy; human security; AI for children; and AI for Peace Ethics.

Digital Peacebuilding Community of Practice (Alliance for Peacebuilding, 2025). The Digital Community of Practice is a network established by NGOs to be a ‘community of practice’. Its founders are Alliance-for-Peace, the Toda Peace Institute, Mercy Corps, and Search for Common Ground. Its work has so far concentrated on ‘digital dialogue and social cohesion efforts, peacebuilding approaches to counter speech and online content that drives conflict, violence, and atrocities, digital media literacy, and broader peacetechnology initiatives.’ It provides resources, including publications and guidance.

ICT4Peace Foundation (2025). ICT4Peace works to support use of information communication technologies for ‘crisis management, disaster risk reduction and peacebuilding’.

Types of organization in the PeaceTech Ecosystem

- Peacebuilders—local and international non-governmental groups—looking to increase tech savviness.
- Private company CSR/Philanthropy Wings

- Ecosystem-building enabler and connector organizations and networks, non-governmental/not-for-profit organizations (NGOs)
- Companies with relevant software
 - Companies focused on a peace impact
 - Companies for hire
 - Hybrid companies with a range of outputs and motives
- Individual tech experts: visualizers, software engineers, data hardware engineers
- United Nations (and other regional organizations)
- Universities
- Funders
 - State funders
 - University grant funders
 - Entrepreneur funders
 - Philanthropic funders
 - NGO funders
 - Venture capitalists

7.8 UNITED NATIONS

The United Nations operates as a PeaceTech innovator and PeaceTech enabler by supporting digital transformation relating to its various peace-keeping, making, and building activities. It also works with member states to ensure that digital tools are developed in harmonisation with UN norms and goals, such as its Sustainable Development Goals. As regards Peace Tech, the UN:

- Innovates to produce PeaceTech applications
- Creates institutions to connect departments and initiatives engaged with PeaceTech digital innovation
- Enables PeaceTech infrastructure so that it can be used by external actors
- Promotes and standard-sets to ensure ethical and responsible development of PeaceTech

The UN seems to be the only possible location of a PeaceTech master-plan that could cohere initiatives across countries and contexts. However, in practice the UN has many different peace-focused spaces and initiatives that are scattered and difficult to keep track of, most of them now with forms of digital innovation. A quick examination of the e-guide for UN staff on the UN's Peace and Security Pillar illustrates the institutional complexity of the UN's peace architecture (UN, 2021b). It therefore tends to work with broad policy directions and discrete organizational responses, although there are ongoing efforts to cohere these.

7.8.1 UN Policy Direction: Digital Transformation

Digital development has been set as a strategic objective by the UN Secretary-General (essentially the CEO of the UN) and is now captured in a range of development plans relating to the UN's ways of working, for example, UN 2.0 and the Information Communications and Technology Strategy (see UN General Assembly, 2022, refined in UN General Assembly, 2024). These strategies are now formally supported by a new Office for Digital and Emerging Technologies (UN ODET, 2025). The ODET also has responsibility for implementing the Global Digital Compact (UN ODET, 2024), a UN framework that aims to create a safe, people-centred digital future underpinned by international cooperation.

While UN policies and strategies continue to develop, digital innovation has already been translated into multiple departmental missions for many years, including those dealing with peace. Indeed, digital transformation has been a bit chicken-and-egg: many departments, propelled by their immediate needs, embraced digital innovation that in a sense drove the wider strategy that now underwrites further innovation. A number of general and department-specific reports and policies therefore underpin particular areas of peace-related digital innovation (see box for key examples), giving the UN its own internal PeaceTech ecosystem.

Institutionally, the UN works to try to join up initiatives to consciously create its PeaceTech ecosystem. The ODET, among other things, works to advise senior UN leadership on key technology trends to guide its strategic approach. It also works to strengthen system-wide coordination within and across the UN system on digital and emerging technologies. More informally, a UN Innovation Network (UNIN), (UNIN, 2025a), operates as an 'informal, collaborative community of UN innovators from across the UN'. It promotes innovation across the UN and hosts

UN Groups on five key topics: behavioural science, digital, blockchain, innovation scaling, and generative AI. UNIN subscribes to Principles for Digital Development (2025), an initiative by multiple humanitarian organizations that was informed by early-stage UN departmental, country, and organizational initiatives.

UNIN provides an Innovation Toolkit (UNIN, 2025b) that provides digital innovation resources that present a useful picture of where and how innovation is happening in the UN. Interestingly, the Guide begins by ‘acknowledging innovation is complex, uncertain and somewhat disorderly’.

Alongside this digital transformation policy and institutionalisation, more specific UN AI policy and institutionalisation is now also rapidly developing, as we consider further in Chapters 13 and 14.

Individual units within the UN, under this broad policy direction and driven by their own needs, often have their own digital transformation initiatives in the PeaceTech space, as set out below.

PeaceTech-Relevant UN Policy (Examples)

Keeping Watch: Monitoring, Technology and Innovation in UN Peace Operations (Dorn, 2011)

Performance Peacekeeping: Final Report of the Expert Panel on Technology and Innovation in UN Peacekeeping (UN, 2014)

UN Secretary-General’s Strategy on New Technologies (UN, 2018)

The UN Secretary-General High Panel on Digital Cooperation Report (UN, 2019)

The UN Secretary-General’s Data Strategy (UN, 2022)

UN 2.0 Quintet of Change (UN, 2025d)

Data for Peace and Security (NYU CIC, et al., 2019)

Strategy for the Digital Transformation of UN Peacekeeping (UN, 2021a)

Information Communication Technology Strategy (UN General Assembly, 2022 and 2024)

Office for Digital and Emerging Technologies (2025), A Global Digital Compact (UN ODET, 2024)

Digital transformation strategies are now in place across peace-related departments, as we turn to.

7.8.2 *UN Global Pulse*

UN DPPA Global Pulse (2025) is described as the ‘Secretary-General’s Innovation Lab—a hub for experimentation to support and advance the UN Charter’. It works through UN Global Pulse Labs, now called Offices, in Indonesia and Uganda with Offices also in Finland and the US. UN Global Pulse and its Labs or Offices work in a sense as ‘ecosystem builders’ as discussed above, by supporting projects and innovation. While largely development-focused, UN Global Pulse connects to conflicts in the relevant regions directly and indirectly, and so intersects with PeaceTech.

7.8.3 *UN Department of Political and Peacebuilding Affairs (UN DPPA): Mediation and Policy Division*

The UN DPPA’s Mediation and Policy Division is centrally responsible for: policy planning; mediation support; gender and women, peace and security; guidance, learning and training portfolios; and the Innovation Cell. All of these areas connect to digital innovation in the peace mediation field. The Mediation Support Unit (MSU) in particular supports mediation policy and practice in peace and transition processes (UN DPPA, Mediation Support Unit, 2025a). The MSU both supports use of digital technologies in peace processes and addresses the problems digital technologies can cause for peace processes. A report into Digital Technologies and Mediation in Armed Conflict (UNDPPA & Centre for Humanitarian Dialogue, 2019) assesses the opportunities and risks related to the use of digital technologies in four key areas of mediation practice; conflict analysis; engagement with the conflict parties; inclusivity; and social media and communication. MSU and its partners advance work across these priority areas and support mediators in effectively integrating digital technologies into their day-to-day practice in peace processes around the world (UN DPPA MSU, 2025b). For examples of UN DPPA and MSU PeaceTech outputs see the box below.

Conflict Analysis: *Framework for Digital Technology Conflict Sensitive Analysis* (UN DPPA MSU, [2024](#));

Course on Digital Process Design and Facilitation (UN DPPA, Build Up, CHD & Tandemic, [2025](#));

DPPA Practice Note: Addressing the Malicious Use of Information and Communications Technologies in Mediation Processes (UN DPPA, [2024](#)).

Engagement with Conflict Parties: *Monitoring of Social Media Provisions in Peace Agreements* (UN DPPA, CHD, & Build Up, [2024](#)).

Inclusive processes. Online Course on Digital Inclusion and Women in Peace Processes (UNDPPA, MSU, [2025b](#))

Communication and Social Media. *Social Media in Peace Mediation* (Lanz et al., [2021](#)).

The MSU is supported in this work by sister organization, the Innovation Cell (UN DPPA, [2025b](#)). The Innovation Cell is ‘an interdisciplinary team dedicated to helping the Department and its field presences to understand and explore, pilot, and scale new technologies, tools, and practices in conflict prevention, mediation and peacebuilding.’ The Innovation Cell has developed multiple initiatives and guides, for examples see the box below.

Making People’s Voice Matter (UN DPPA, [2025c](#))

Social Media Analysis Checklist (UN DPPA, [2025d](#))

Two further aspects of the UNDP A Innovation Cell’s work deserve mention as critical to the PeaceTech ecosystem more widely. First, the provision of an open access Peace and Security Data Hub (UN, [2025e](#)), modelled on the UN Humanitarian Data Exchange (UN, [2025f](#)), itself also a useful PeaceTech resource. These are essentially data repositories which work to curate relevant global data and make it easily accessible on an open-source CKAN ([2025](#)) data management system. This initiative plays a systemic PeaceTech role.

Second, the Innovation Cell has become a leading actor within the UN system on the responsible use of AI, particularly Gen- AI, for political analysis, inclusive dialogue, and mediation support. This work includes developing practical use cases with Special Political Missions, strengthening governance frameworks for AI workflows, and piloting tools that support conflict analysis, horizon-scanning, and large-scale digital dialogues. Through these initiatives, and its partnerships with academia and technology institutions, the Innovation Cell operates in an enabling capacity, helping to create a shared digital infrastructure, piloting new tools, and developing a wider community of practice for PeaceTech.

7.8.4 *Peacekeeping and Political Missions*

Peacekeeping is a vital component of third-party support for conflict prevention and for supporting the implementation of peace agreements. It involves sending UN troops and other staff into conflict zones to help ensure peace. Special Political missions are often also put in place to help implement peace agreements (see UN Missions, 2025).

UN Peacekeeping has seen further digital innovation initiatives. In 2021, a new *Strategy for the Digital Transformation of UN Peacekeeping* was published (UN, 2021a). However, digital transformation had already been in progress for some time. UN Political Missions have also engaged in digital transformation projects, in particular related to data analysis to support conflict resolution. A digital interface—the *Situational Awareness Geospatial Enterprise (Sage)* Computer IT system (Manning, 2018) now supports mission reporting in select countries, using the Ushahidi software developed in response to the Kenya election crisis discussed earlier. The system provides for incident reporting by peacekeepers and for ‘situational awareness’, and it has diverse forms of data feeding into it. This tool is part of an attempt to provide peacekeeping ‘intelligence’ to support safe and effective operational capacity, and can ingest a huge amount of data, including data collected from intelligence technologies that are themselves experimental for the UN (for example, tethered balloons, see Druet, 2021).

More recently, a distinct system called the Comprehensive Planning and Performance Support System (CPAS) (UN Peacekeeping, 2025) aims to support ‘adaptive management’ by peacekeeping missions by providing a data basis drawing on formal datasets and mission-specific data and reporting, to support better planning and decision-making (see further

De Coning & Brussett, 2018). We will return to these data initiatives in later chapters.

7.8.5 *Other Peace-Related Departments and Digital Innovation*

All of the key UN organizations whose work connects in some way to peacebuilding also have their own digital transformation initiatives. The following examples illustrate.

- The UN Refugee Agency—UNHCR that has responsibility for those displaced by conflict has an Innovation Service, which includes a programme on digital inclusion of refugees in planning (UNHCR, 2025b).
- UN Women has an innovation strategy, focused across its work (see UN Women 2017). It has supported the PeaceFem app (2025) which my research team at University of Edinburgh has been involved in creating, described further in Chapter 9.
- The UN Office of the High Commissioner for Human Rights (OHCHR), which coordinates its human rights work and works in critically conflict-affected states, has a Hub for Human Rights and Digital Technology (UN OHCHR, 2025), including a useful resource page.
- UNICEF working for children's rights has a digital transformation mission (UNICEF Digital Impact, 2025) and addresses the impact of digital technology on children.

7.9 REGIONAL ORGANIZATIONS

The UN has built a PeaceTech ecosystem that is rapidly proliferating as a fragmented set of activities that overarching bodies work to cohere. Regional organizations are working to support digital transformation across their regions, in ways that can support PeaceTech initiatives. However, they have fewer specific PeaceTech tools.

The EU supports European-wide digital transformation through its EU Digital Single Market Strategy (EC, 2015), and the 2030 Digital Compass (EC, 2021). These strategies underpin a variety of initiatives relevant to PeaceTech, for example, through legislation such as the AI Act (2024) and the Digital Services Act (2022), through digital diplomacy,

and by establishing a Cyber Diplomacy Toolbox to counter malicious cyber-attacks (EU Cyber Diplomacy Toolbox, 2025). However, it has no more detailed PeaceTech policies.

The African Union supports an Africa-wide digital transformation strategy (AU, 2020), but this is more about supporting African digital development than setting out a clear strategy for digital transformation of the organization itself. However, there have been significant attempts to support cyber-diplomacy (AU, 2024b), and to put in place an AU Continental Early Warning System (AU, 2018). A Continental Artificial Intelligence Strategy (AU, 2024a), while not explicitly peace focused, addresses how to have a people-centred, development-focused, and inclusive, approach to AI, setting out tasks such as establishing a suitable governance framework. Digital transformation strategies have also been produced by ASEAN (2022).

7.10 THE ECOSYSTEM

The above panoply of initiatives and actors has been described by NYU CIC as a PeaceTech ecosystem. The UN and regional organizations can also be understood to have their own internal ecosystems. The PeaceTech ecosystem refers to the diverse range of actors and institutions building a PeaceTech concept and practice (Panic, 2020). The metaphor of an ecosystem refers to ‘complementary dynamic environments in which innovative approaches are implemented.’

It is possible to map this global PeaceTech ecosystem in lots of detail. NYU CIC and EUI have done just this in interactive actual mapping of diverse projects. The Global PeaceTech Hub Global PeaceTech Map (EUI, The GovLab, University of Lucerne, 2025b) sets out 182 PeaceTech projects. The NYU CIC map (2025b) is connected to an Ecosystem report (Panic, 2020).

Indeed, nearly all PeaceTech reports spend time mapping and illustrating PeaceTech to try to capture what it comprises. They produce long lists of interesting examples. By the time reports are published, however, the world they describe is already out of date. Collectively, PeaceTech reports and mappings reflect an ecosystem that is constantly changing and populated by eclectic actors and initiatives that come and go. The NYU CIC and EUI mappings are online and interactive and ongoing in part to enable mapping a fluid PeaceTech world, with maps that can be changed over time.

The NYU-CIC PeaceTech Ecosystem report suggests five elements are important to building the PeaceTech ecosystem in the future:

- Building trust through human-centered approaches
- Capacity building
- Innovation
- Providing principles and frameworks
- Building community and partnership

7.11 A WORD ABOUT ECOSYSTEMS

Rather than doing organizational/initiative mapping—the existing ones are ongoing and excellent—I have focused more on thinking about the types of organizations involved and why they might be involved. Not just, ‘who’ is doing PeaceTech, but why and how?

I am interested in how the ecosystem is produced and what it in turn produces.

The word ecosystem is interesting here. We think of an ecosystem as ‘just there’. Yet, the whole idea of an ecosystem is an attempt to talk about both agency and natural development and how they come together, say, to create a garden.

We know that things we do and don’t do affect a garden’s ecosystem—like putting slug pellets or not putting slug pellets on our vegetable patches. Other changes to the garden ecosystem happen randomly—like a major frost that destroys some plants but not others. Yet others are produced by legal regulation—such as preventing people from using certain pesticides. The ecosystem will also have boundaries that are often artificially created and sustain the particular form of life there—whether it is by the garden wall or our labelling of a particular habitat as a protected ecosystem.

Ecosystems, like life itself it would seem, develop stochastically. This is a great word that means ‘partly by design and partly due to random elements.’ In other words, we control some things, but not others, and cannot always control how these interact.

7.12 CONCLUSION

My functional account of the types of organizations involved in the PeaceTech ecosystem, as set out above, starts to tell a story of how complicated it can be to understand where and how digital transformation of peace making, keeping, and building is taking place. The field is eclectic and overlapping, with rich resources.

If we step back, it is worth asking—what does the PeaceTech ecosystem sustain, what does it not sustain, what could we re-balance if we could? Are the motives of those in the ecosystem aligned? Does that matter?

These seem important questions for understanding how to access and navigate the ecosystem, and we explore them by looking at practice applications of PeaceTech in Part II and a fuller exploration of how PeaceTech praxis, ethics, risk, and technomorals intersect in Part III.

Questions

1. Do any of the types of organization in the PeaceTech ecosystem surprise you, and why?
2. Are there any types of organization missing?
3. What do you think this ecosystem would be good at producing? What might it struggle with?
4. What do you think of the PeaceTech maps? How coherent is our concept of ‘what is PeaceTech’?

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PART II

Doing PeaceTech



CHAPTER 8

PeaceTech as Hack

Abstract A range of transformative digital technologies are now used to support discrete peacebuilding tasks. These include mobile phone technology and ‘applications’ or apps; gamification; virtual reality; and big-data capacity to analyse social media or surveys, sometimes with forms of AI. This chapter examines PeaceTech innovation regarding discrete peacebuilding activities. This is PeaceTech as a digital ‘hack’ designed to support discrete peacebuilding tasks. It involves a ‘once-off’ task that digital tools assist. In some cases, hacks can produce a reusable new methodology. I examine whether a digital ‘hack’ to peacebuilding tasks is a form of responsiveness to peacebuilding needs or an unambitious fiddling-round-the edges sort of response to ‘double disruption’. I ask, ‘what is going on *really*’?

Keywords Hacktivism · Modularization · Retrofitting · Adaptive peacebuilding

8.1 TASK-BASED DIGITAL INNOVATION

We ended Part I by asking what the PeaceTech ecosystem provides. PeaceTech appears as a messy tapestry of examples, and multiple accounts of it begin with mapping what forms of PeaceTech are going on, because it can be difficult to paint a coherent picture of the concept.

One answer, therefore, is that the ecosystem incubates scattered PeaceTech hacks to assist discrete peacebuilding tasks. This is perhaps because peacebuilding itself involves a diverse set of practices. The label PeaceTech suggests a whole that is more than the parts. But does PeaceTech as a coherent set of practices exist? After all, people are using technology in new ways all the time, with whatever they are doing.

This chapter examines PeaceTech as ad hoc digital peacebuilding-support and considers how it supplements low-or-no-tech practices to create greater peace process reach and traction. I call this PeaceTech as ‘hack’ because it tries to make peacebuilding practices more efficient and effective through task-specific apps, online methodologies of consultation, improved security of communication, or technical fixes for peace agreement implementation tasks.

In subsequent chapters, we will consider PeaceTech bundles of work that have ambition to be ‘of scale’ and offer themselves as solutions at a system cross-conflict level because they provide entirely new capacities. However, this chapter asks—are once-off applications in fact the main and best contribution of PeaceTech?

8.2 PEACEBUILDING TASKS

At the beginning of our PeaceTech journey, we asked experienced peacebuilder Andy Carl to map PeaceTech as a field; his work continues to influence ours and this book. He did not start with technologies or interventions of scale. He noted that PeaceTech solutions could appear very ‘supply-side’ driven—solutions produced for which no need has been articulated (Carl, 2024). Working from a more ‘demand-side’ perspective, Andy set out a list of peacebuilding tasks and needs. His framework has a broad application to all forms of peacebuilding, but it is useful to showing how key tasks undertaken to create and sustain a peace process can be the subject of digital experiments in-country (for further examples focused on inclusion, see Hirblinger, 2020; and Schirch, 2024). I set it out here in modified peace-process applied form.

Understanding (analysis and sense-making) using innovative data-driven approaches

- Conflict and situation analysis to inform peace and conflict prevention and management response strategies

- Understanding and seeing trends and patterns
- Media monitoring and news aggregating
- Public perceptions, views, and opinions analysis
- Early warning and conflict and security risk monitoring (including maps and satellite image analysis),
- Processing and translating big data
- New data generation

Learning (knowledge and skills-building) using innovative communication technologies, data, and interfaces

- Informing stakeholders' peace process strategies, tactics, and decisions
- Conflict and peace-related data sets and analysis
- Comparative learning
- Knowledge-sharing
- Informing of the strategic learning needs of primary parties in negotiations

Enabling and supporting mediation digitally through data, online meetings, and virtual reality

- Enabling virtual meetings
- Facilitating consultation feed-in
- Improving mediator access to comparative data
- Helping mediators understand conflict contexts
- Reaching hard-to-reach communities
- Providing for education

Strategic communications and enabling participation in peace processes (with conflict parties and wider society) using digital innovation

- Encrypted channels of communication for digital mediation
- Strategic public communications on peace processes and agreements
- Alternative and safe (virtual) space(s)
- Digital dialogues (online)
- Digital platforms for engagement

- Enabling collaboration

Influencing and educating through digital means

- Influencing behaviour and personal choices through gamification and online information
- Promoting ideas, values, attitudes, and behaviours as above
- Mobilizing civic constituencies and activism
- Countering abusive, coercive, and militarized uses of digital technologies
- Immersive Environments
- Pro-peace and pro-resolution (positive) digital communications
- Resourcing (encouraging business community to value and invest)
- Collecting data and countering hate speech and rumours

Accountability and Transitional Justice using online mechanisms

- Online advice, counselling, and resources
- Online memorialization and virtual site-visiting
- Listening and promoting understanding through online tools
- Promoting digital engagement with transitional justice mechanisms

Countering cyber-attacks, rumours, and disinformation

- New ‘hate speech’ lexicons that enable hate speech to be identified in key conflict dialects, or identifying colloquial forms of hate speech
- Ways of collecting data that can be quickly erased from devices using cloud computing

Managing (and organizing) using generative AI

- Project planning
- Evaluating peacebuilding

Interestingly, ‘PeaceTech enabler’ organizations often also set out tasks and match possible ‘methodologies’ that digital innovation can enable. ConnexUs (2025), which describes itself as a ‘social network’ and involves a collaboration between Build Up (2025a) and peacebuilding NGO

Search for Common Ground (2025), for example, provides an interactive web-based Digital Peacebuilder's Guide (Search for Common Ground, Build Up, & ConnexUS, 2025). The Guide is a great 'ecosystem' intervention that supports digital design and capacity. The list of tasks overlaps with Carl's. It includes tasks such as 'advocacy awareness' that have analogue methods and some digital peacebuilding techniques that have no analogue counterpart, such as digital information hubs, or games that can be used for peacebuilding. It is a terrific resource worth exploring for inspiration. The guide provides a choice of 'goals', with each goal linked to a set of digitally enabled tasks that in turn link to a 'digital peacebuilding approach'. Each approach includes a good description of the digital tool or technique, what skills are needed to be able to use it, and compelling examples of each in action in a conflict context. You can use it to find real world examples of the types of digital innovation in the list above.

8.3 'ONE THING' DIGITAL TECHNOLOGIES

There are a number of digitally transformative technologies that come into play in 'once-off' PeaceTech applications, as some examples illustrate.

App-ization. In Chapter 1, Atem and Warren made an app to address localised violence. Seldom discussed as a game-changing technology on business courses (although the underpinning mobile technology is discussed), is the capacity to put small programmes into simple 'apps' as in forms of programme that can be used simply and easily from a mobile/smart phone. Apps are now a common form of PeaceTech tool designed for conflict contexts. Apps can be used to gather data. KoboToolbox (2025), for example, provides a survey/data collection tool for challenging settings. KoboToolbox can be used online or offline, and synchronises in brief moments of connectivity, enabling transfer off local mobile phones. It provides those collecting data with pre-programmed automated ways of creating statistical graphs and forms of descriptive analytics regarding the results of any survey.

Another interesting example is **eyeWitness to Atrocities** (Lexis/Nexis, 2025), provided by LexisNexis and the International Bar Association. This is an app that provides a mobile camera capacity to human rights defenders to document human rights abuses. The app uses metadata, storage, and verification mechanisms that meet 'trusted chain of custody' requirements of international fair trial standards as regards evidence. The

app can be ‘disguised’ on phones, where the security of human rights defenders is a concern.

Gamification. A range of self-managed deliberation tools provide forms of gamification or deliberation that aim to bridge polarization on contentious issues relating to the peace process. **Sole, Self-organised Learning Environment, Colombia** (2020), for example, has used a self-organised learning environment platform in Colombia to engage people in answering big social questions, with a view to peacebuilding. Also in Colombia, the **Atrévete online deliberative platform** involved a gamified process that supported participants in discussing controversial peace process issues (see Restrepo, 2018). These forms of online deliberative tools often create forms of moderated debate, which try to increase understanding across polarized views and change views through the process of engagement.

Deliberation Platforms. There are now a variety of tools that can be used to enable deliberation, or to survey people on their views in ways that go beyond questions and answers to exploring what might change their perspective. Increasingly, these use forms of AI for analysis. UN DPPA Innovation Cell, for example, has used Remesh to support digital conversations in Yemen, Libya, and Iraq (UN DPPA, 2025c). Remesh (2025) is an online platform, which in this case was used for participants to anonymously share their hopes and opinions on their country with UN leadership. The platform then used AI to analyse participant responses in real time, to help UN officials better understand views of peace constituencies. We will examine this use of AI further in Chapter 13.

Virtual Reality. Virtual and augmented reality has played a role in enabling visualization and forms of gaming. The UN DPPA Futuring Peace initiative, already mentioned, has experimented with using virtual reality to connect a range of people, including mediators, to situations in-country that are impossible for them to visit in a number of different contexts (UN DPPA, 2021; UN DPPA Global Pulse, 2019).

Big Data, Machine Learning and AI. Big data on the views of conflict-affected populations drawing on varied resources plays a key role in informing conflict analysis and supporting mediation efforts and can be garnered from social media platforms and large-scale surveys. Forms of machine learning can enable information from, say, peace process submissions or platforms such as Remesh, to be parsed into subjects very quickly and brought together with other data points such as X/Twitter or other social or online media analysis.

Data visualization. Data interfaces, dashboards, and interactive maps enable ways of participative interactive visualization of information about peace and conflict situations and can facilitate access to resources. For example, the Carter Center’s Syria Conflict Mapping Project (Carter Center, 2025) has used analysis of open-source information related to the Syrian conflict, together with consultations with people in-country, to document and map over 200,000 conflict events in Syria. The project also mapped changing relationships between thousands of armed groups and changes in the lines of control between them. This information was then used to provide mediators and humanitarian responders with up-to-date analysis of developments in Syria.

8.4 PEACE TECH VALUE-ADDED

What does PeaceTech as Hack offer to peacebuilding? As noted in Chapter 5, in the business world digital transformation projects are driven by the concept of value, as in what they add to the business profits by adding efficiency, speed, or automation of tasks that reduce staff costs. If you look at the lists above, the digital methods change core peacebuilding practices potentially adding value in a number of ways.

Remoteness and capacity. Hacks offer a capacity to work more remotely from the people being interacted with and therefore bring staff and budget efficiencies. They also provide capacity to navigate lack of safe travel, or dangers in face-to-face meetings.

For example, in Ukraine in 2014, **Donbass Dialogue** (2025) created a crowdsourced dialogue platform to provide a way for those looking for nonviolent resolution of the conflict in the Donetsk and Lugansk regions to interact and share ideas across divided communities that were often spatially segregated across conflict lines. **Incore’s Cain** project in Northern Ireland (Incore, Cain, 2025) has provided a database of physical memorials to victims across the country with geolocations and photographs. The memorials database is also available in ‘app’ form, enabling those who want to visit the memorials to do so. The resource also enables relatives of victims who may not be able to visit memorials because they feel unsafe or live abroad, to visit virtually.

Scaling up and out. Hacks offer a capacity to reach and incorporate the views of many more people than analogue methods because of their greater systematic capacity to survey, greater capacity for automation

of survey and responses, or because innovation reaches new constituencies who are remote physically or disengaged from formal processes. X/Twitter analysis, for example, can reveal social attitudes (at least of X/Twitter users), and inform how to influence audiences, or what forms of disinformation need to be combatted. These are new peacebuilding tasks that digital transformation in a sense enables and creates.

In a peace process, digital innovation can improve the reach of consultation. For example, in Libya, an interactive website in Arabic established in 2017 enabled engagement with the UN's National Action Plan for Libya. A key element of this Plan was the organisation of a National Conference and a preparation process. The website enabled people to engage with the process and submit views (see further UN DPPA & CHD, 2019; Lanz & Eleiaba, 2018). **Everyday Peace Indicators** using SMS to reach remote communities, already mentioned, provides another example of how a simple technology can be used to increase and expand population reach.

Appeal to new constituencies. Hacks can also extend peacebuilding's reach to children and young people, and in particular young men who are the recruitment ground of armed groups, but also possible next-generation peacebuilders. Butterfly Works' Arabia Felix games discussed earlier, are an example.

Scientific method. Hacks offer an apparently more 'scientific' method of canvassing views because they add capacity to quantify communications and responses and develop data analytics regarding survey responses. They provide a better evidence base than impressionist or personally biased information as to 'what people think' (although of course biases can exist also in data gathering).

New mechanisms of influence. Hacks offer new and different ways to influence. Digital developments such as 'gamification' of peace and use of deliberative platforms aim not just to engage people in questions of peace, but to almost get into minds and shape attitudes or ideological positions. During peace processes, digital innovation can improve strategic communication or help to counter-act disinformation or counter-messaging. For example, PeaceTech Lab had developed Hate Speech Lexicons in different languages that understand overt and coded vocabularies of hate speech, across dialects, to enable hate speech in social media to be identified, monitored, and combatted in conflict areas.

New Systems of Support. Digital interfaces offer new mechanisms for institutional support. For example, in Sudan the **Conflict Sensitivity**

Resource Facility (2025) aims to support a range of international actors and interventions to have a ‘conflict sensitive’ approach, so that they coordinate to support a struggling peace process (at time of writing, disrupted by conflict). It works by providing guidelines, research, and a space for ‘critical reflection’ on conflict sensitive practice. The interface provides an interactive map of Sudan, designed to support aid workers and peacebuilders.

8.5 ‘AD HOC-ERY’—GOOD OR BAD?

Ad hoc digital peacebuilding is responsive to people just wanting to do ‘one good thing’. But is it sustainable? Is ongoing experimentation or ‘hactivism’ good or bad? Does it deliver on the promise of digital transformation in the peacebuilding field? And—perhaps most crucially—does it address the wider disruption of peacebuilding in a positive way?

PeaceTech hacks are not necessarily all ‘once-offs’. They can be transformed into something more if some of the technological applications can be designed for re-use and re-purposing, or if a business model can be developed to sustain the initiative. Organizations are also beginning to build open-source tools that scale how PeaceTech capacity can be accessed. For example, Build Up has recently released Phoenix (Build Up, 2025d), a tool for conducting social media analysis that is open source and can be used by any organization, thereby meaning people do not all have to create their own capacity.

However, even a cursory glance at PeaceTech initiatives indicates the number of experiments and software innovations that have disappeared into the mists of time. Perhaps that does not matter if a very context-specific, time-limited use was intended and the job was done. Nonetheless, questions should always be asked, ideally at PeaceTech design-stage, about use of resources and what constitutes good design practice in terms of future use.

Beyond these practical questions, how should we understand and evaluate PeaceTech ‘value-added’? More than that, how should we understand PeaceTech’s techno-politics? I suggest three different ways of understanding the relationship between PeaceTech ‘task-focused’ experiments, and the practice of peacebuilding, each of which provides a different way of understanding whether and how ‘tech’ adds value and what the techno-political consequences of using a digital approach to the task are.

8.5.1 *PeaceTech as Retro-Fitting*

When you have an old house and want to add wall and roof insulation to bring it up to the energy efficient standards of new houses, you will be ‘retro-fitting’. Retrofitting is the act of adding something more technologically advanced than previously existed, long after the building has been built, to make it more efficient.

One view of PeaceTech-as-hack is that it involves ‘retrofitting’ digital innovation to standard tasks (on retrofitting cf., Walker, 2024). In nearly all of the examples above, what is offered is a new digitally enabled way of doing something that peacebuilders always did better, such as building trust, improving communication, monitoring outcomes. What the technology offers is a better, more efficient way of doing something that used to be done another way—a form of value. The analogy of retrofitting suggests the practice of peacebuilding remains the same, much as the retrofit house is still the same house. It is just how it works that is ‘improved’.

8.5.2 *PeaceTech as Modularisation*

However, sometimes PeaceTech seems to offer a more radical modification of peacebuilding practices than the retrofitting analogy captures. Desai and Lang, examining the development work of the UN Global Pulse’s PulseLab Jakarta, have suggested that we should think of digital innovation, less as ‘retrofitting’ and more as ‘adding a module’ to traditional development planning practice (Desai & Lang, 2022).

Modularisation lies at the heart of contemporary business practice and involves creating a standard base machine that can then be customized in multiple ways by the attachment of different modular components in different combinations (see e.g., Mertens et al., 2023). Adding different components can change what it is that the machine is. A phone can become a top-spec camera, or, as we saw in Chapter 3, a fitness watch can become a ‘health wearable’.

For businesses, modularization has the advantage of creating a flexible production system that enables multiple customized configurations of a product, while reducing what is re-fabricated each time. It reconfigures production processes from an engineer-to-order to a configure-to-order operating model. In other words, building products moves from

‘building-from-scratch’ to ‘assembling-from-parts’ production. Modularization makes products less effortful to customise and therefore reduces costs because the internal complexity in fabrication is reduced by having standardised components.

Desai and Lang (2022) unpick how digital transformation in the form of ‘big data’ and ‘data analytics platforms’ changes what we understand development interventions to be. In the development sphere, they suggest that the idea of ‘modularisation’ is a better analogy than either the idea of retrofitting digital techniques onto an old practice or the idea that digital tools provide a completely new way of working. They suggest that digital innovation bolsters a shift in development practice, from supporting better outcomes to supporting better planning processes.

Desai and Lang, however, suggest that modularization does not simply enhance development planning but instead works as ‘a set of techniques for disrupting and enhancing an existing planning regime’. They argue that its transformative effects are always ‘made operational in the context of that relation of enhancement and disruption’ (Desai & Lang, 2022, p. 312). In other words, digital modularization attempts to enhance development planning practices, but by adding digital components it disrupts how development planning proceeds. For example, digital innovation can produce agile data on human responses to development planning, or new forms of inclusion, that then provoke new planning adaptations. Therefore, development planning is transformed into a more fluid responsive ongoing process. This insight has resonance in the PeaceTech context.

Modularisation is a useful way to understand what digital technology contributes to peacebuilding. Many PeaceTech examples focus on better communication, participation, and inclusion, and seem to offer not just better efficiency but a new capacity to deliver a more ‘adaptive’ form of peacebuilding better suited to the double disruption age we are in. PeaceTech enables new ways of surveying and hearing civic voices with reference to a national peace process, and new ways of engaging citizens in deliberation, and enabling international actors to ‘see’ and understand what people in the country want of the process. At the local level, modularization offers projects agile tools for avoiding, or mediating violence in their immediate neighbourhood, like Atem’s app in Chapter 1. The ConnexUs Guide in a sense holds out an offer of modularization by asking what the peacebuilder is trying to do. Then, rather than retrofitting a digital tool to an old practice, it points to a new way of bolting digital

innovation onto the practice to make the peacebuilder differently agile and flexible. The bolting on also customises the practice to be something different than it was before, different in scale, in reach, in responsiveness, and so disrupts more contained ways of doing business because it calls for ongoing adaptation.

Is this not exactly what is needed in the age of double disruption? Adaptive peacebuilding is a term that De Coning coined in response to the early challenges of ‘double disruption’ (De Coning, 2018). Adaptive peacebuilding focuses less on achieving pre-defined peacebuilding outcomes and more on fashioning experimental interventions to respond in an agile way to complex political processes where unexpected things happen. Adaptive peacebuilding requires ongoing information gathering and ongoing agility of response, and this in a sense requires the type of value that digital modules add to the practice. It is almost impossible to separate adaptive peacebuilding from PeaceTech innovation. De Coning’s own work arose in the context of arguing for new data-driven platforms to support peacekeeping, that were ultimately responsible for the UN CPAS Comprehensive Planning and Performance Assessment System (UN Peacekeeping, 2025), discussed in Chapter 10.

Modules, however, can also be bolted on to practices other than peacebuilding. Many of these same digital techniques can be bolted on as modules to forms of war. Bolting the same tools, such as those enabling social media analysis, to war-making tasks leads to more agile, flexible, and efficient ways of pursuing war, which change what we even constitute to be war, as cyberwarfare illustrates.

Does this matter? Most tools can be used for good and ill, as we discussed in Chapter 2. In my view it does, even if there are no easy answers. The fact that digital modules can support not just peacebuilding but warmaking often enmeshes peacemakers in business relationships with businesses that are simultaneously central to war efforts. Digital modularisation can also lead to a form of remoteness that quickly becomes a curious fake-real space of hactivism, in a context in which war-making and peacemaking themselves are intertwined in new ways. For example, a key dynamic of double disruption is the way in which it is now difficult to label mediation processes and agreements as clearly about either peace or war. They now often provide for peace in one direction and war in another. The ability to articulate peace to be war and war to be peace, and to fuel this with disinformation, when coupled with peacebuilding’s

potentially increased ‘virtual’ nature, leaves ‘reality’ somewhat suspended across the board and hard to pin down.

However, virtuality may have upsides as well as downsides. Hirblinger argues that some of the ‘non-tangible’ outcomes of digital technologies are not fake but part of a ‘*a subjunctive*’ sensitivity for future worlds that ‘could’ or ‘should’ be’ (2023, p. 113). That is, digital technologies can enable people to new forms of imagination for peace.

8.5.3 *Hacks and ‘Double Disruption’*

A third related, more provocative idea as to ‘what is really happening’ is suggested by David Chandler’s work in the development field (2017). Chandler suggests that a kind of unravelling of certainty as to ‘big development interventions’ reflects a new recognition of the profound political difficulties of achieving structural change in development contexts. He suggests that in the absence of believing in structural interventions anymore, experimental once-off hacks that digital innovation offers are attractive. He uses the term ‘hacktivism’ and an analogy with ‘life hacks’ to explain. Big issues cannot be solved, but experimental ‘hacks’ that offer small improvements may make a big difference in a chaotic world that seems out of control and out of your reach to change. You can’t cure the pain of human existence, but you may be happier if you make your bed in the morning, sort of thing.

Chandler seems partly attracted by the move, as he sees it, from the certainty and hubris of ‘the big international development intervention’ towards a more modest task of helping people in their more local development projects. However, he is simultaneously sceptical, arguing that the move to hacks is also a move to accept a socio-economic status quo, given an inability to change it.

Does this analysis have resonance in the peacebuilding field? If the ‘big peace process’ is no longer possible in the world’s most protracted conflicts, and logics of war and political marketplace are prevailing over logics of civiness, then what is left? Supporting local people to ‘do their own thing’ adaptively, including in a remote way by providing digital resources. This support becomes perhaps the only sensible intervention and is now often presented as the solution to peacebuilding’s current crises of funding, certainty, and global positioning (Muggah, 2025).

It is interesting, is it not, that Seán in Chapter 1 was working for the UN, but on local peace—something that might not immediately

be recognised as a ‘threat to international peace’ that the UN is set up to address. Yet, local agreement making makes sense as a strategy for unravelling a complex conflict system in the new double disruption context—particularly if no other peace process is possible. However, does support to local peace projects essentially admit defeat with respect to ending the national conflict status quo?

8.6 RISKS

Hacks, of course, have risks. Chief amongst them is the risk that those employing apps, or games, or deliberative platforms may not be sufficiently aware or technologically competent to ensure that they are not cyber-hacked, which could leave users insecure. However, there are other risks that do not fall within our normal assessment of ‘risk’, as we consider further in Chapter 16, including the risk that virtual or remote engagement creates a profound ‘unknowing’ of any of the contextual character of conflicts, or the real people who suffer in them.

8.7 CONCLUSION

Is the charge that ‘hacktivism is a capitulation to the status quo’ fair? Not entirely. Perhaps I am wrong, but Chandler himself seems a little conflicted as to whether experimental responsiveness to the difficulties of big structural change is to be welcomed as a less hubristic, more practical form of development practice, or rejected as pro-status-quo. In the peacebuilding area it can be argued that ‘ad hocism’ is not a new product of digital technology’s impact, but already existed due to the scattered, overlaid, and often un-strategic practices of peacebuilding itself. Was peacebuilding already a set of hacks that attempted to impact on conflict, and if so, was that bad? Lederach (2024) after all, points to the importance of ‘pocket peace’, to neutralise local conflicts before armed actors can link them up to form a nation-wide conflict system. He does not view localised ‘hacks’ as a capitulation to the status quo but sees them as operating in an invisible holistic way. Lederach holds out a picture of peacebuilders of different types moving through conflict landscapes, picking up and setting down tasks and leaving traces for those around them to follow, rather like bees in a colony. Their individual hacks become part of a systemic anti-conflict dynamic, capable of unwinding a conflict system.

The digital revolution's connections to war have also required new digital peacebuilding hacks to combat digital innovation in warmaking, such as tackling online disinformation. Some of the structural interventions in the field, such as hate speech lexicons for use with AI or social media monitoring tools seek to enable peacebuilders to engage in these new tasks.

My view is to draw on Lederach to suggest that peacebuilding hacks have a capacity to unwind conflict systems. If a conflict system exists that is a system made up of related conflicts rather than a singular conflict, and needs to be unwound, then perhaps it is time to ask ...

How do local actors try to build peace from nothing? What activities of international peacebuilders support this? How do local people engaged in 'civicness' attempt to widen and deepen elements of a peace process into something capable of having nation-wide impact? What would it mean to leverage PeaceTech better, to support these activities?

For me, PeaceTech-as-hack poses the question of whether digital innovation could be more ambitious. Could it help cohere hacks into an incrementalist vision of piece-by-piece 'conflict unwinding' as a matter of strategy? I think there is something in how hacks can be made to add up. How would the current PeaceTech ecosystem would need to change to support this strategic vision?

Questions

1. What do you think about PeaceTech 'hacks'? Are there any examples you particularly like?
2. How do they 'hack' more traditional ways of 'doing peacebuilding'?
3. Which analogy for how PeaceTech works do you think works best?
4. What is good and bad about 'life hacks'? Do these same things apply to PeaceTech 'hacks'?
5. Should PeaceTech try to be more systematic? How?

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CHAPTER 9

Doing One Thing

Abstract How does one operate as part of the PeaceTech ecosystem? Often digital transformation projects start by ‘doing one thing’. In this chapter, I offer two stories relating to how our PA-X Peace Analytics team produced ‘single-use’ PeaceTech tools that could be argued to be hacks. The stories illustrate the difficulties of PeaceTech delivery in practice and the types of relationships that must be created to deliver workable products. I point to how developing PeaceTech tools requires constant interaction between theory and practice, or praxis.

Keyword Ceasefires · Women mediators · Covid ceasefire tracker · PeaceFem

9.1 BACKGROUND

The PeaceTech Ecosystem has evolved from many attempts to produce tech products to solve discrete problems. It therefore supports PeaceTech as eclectic hacks, more than a holistic digitally transformed field, as examined last chapter. The eclectic nature of PeaceTech innovations stand somewhat in contrast with WarTech, whereby practices of war are becoming digitally transformed—utterly.

However, the stories that follow illustrate how developing even modest discrete tools requires a myriad of relationships and capacities that are

themselves constitutive of the ecosystem. In these stories I trace how we developed two discrete ‘tools’ and illustrate how these were embedded in praxis approaches that had an eco-building dimension.

9.2 CEASEFIRES IN A PANDEMIC

When the COVID-19 pandemic was in its early days and the world struggled to respond, the health threats of conflict seemed more unnecessary and preventable than ever. It was therefore unsurprising that close to the start of the pandemic, the UN Secretary General publicly called for “a global ceasefire in all corners of the world to focus together on the true fight—defeating COVID-19” (United Nations, [2025c](#), [2020](#)). In the days and weeks that followed, over 180 countries, the UN Security Council, regional organizations, civil society groups, peace advocates, and millions of global citizens all endorsed the UN Secretary-General’s ceasefire call.

The question was: would it make any difference? Would people respect a ceasefire?

Ceasefires are commitments by those involved in fighting to stop fighting, temporarily or permanently (Clayton et al., [2025](#)). They can also be called truces, armistices, cessations of hostilities, or humanitarian pauses.

Explore Ceasefires

You can explore further how ceasefires work in our peace agreement data, by searching ‘ceasefires’ at the PA-X website (PA-X Analytics, [2025a](#)). For an interesting project on both written and unwritten ceasefires, see the ETH Zürich ceasefire dataset (ETH, CSS, [2025a](#), [2025b](#)). For our ongoing analysis of ceasefires, see our key findings and policy recommendations (PeaceRep, [2025d](#)).

There was some precedent for anticipating that the UNSG’s ceasefire call could be effective. Ceasefires are sometimes agreed in the face of a health crisis, for example to ensure access of medicines or vaccines. These are what are sometimes called ‘de-confliction’ agreements (a form of

humanitarian agreement) that can also enable things such as how humanitarian trucks will receive permission and protection to pass through checkpoints (see Dorith Kool et al., 2021; Haider, 2022).

In any short ceasefire, a window of possibility is created. Even where the ceasefire addresses a specific moment or task, it may somewhat ‘disrupt’ the conflict, shifting its landscape. People can see what life without the conflict is like, and their response can influence armed actors who claim to represent them to consider moving from conflict. Armed groups can take risks and find new political opportunities open to them, including forms of international recognition, that give them confidence to move from violent pursuit of their goals. However, armed actors also fear even temporary ceasefires as armed activity is often held together by mounting military operations.

9.3 RAPID CEASEFIRE ‘DATA’

Through PA-X Analytics (2025a), we provide peace process data, including a repository of all written publicly available ceasefires. This data led to our involvement as part of a group of practitioners who advise, mediate, and monitor ceasefires under the auspices of USIP. The group involved peacebuilding organizations, individual mediators, mediators from the UN Mediation Support Unit (UNDPPA MSU, 2025a), and researchers with expertise on ceasefires. Members began to exchange information on how the UN Secretary General’s call was being implemented, with a view to providing practical support. Collectively the group had direct contacts into a large number of active conflict situations.

The group exchanged information on pandemic ceasefires, in a sense generating ‘data’ on what was happening with ceasefires. Surveying country experts is a recognised form of data collection. Practice-based knowledge was supplemented by researchers engaged in documenting ceasefires, with established methods of unearthing them, such as ETH Zürich’s Govinda Clayton and ourselves at University of Edinburgh. Triangulating this information gave a comprehensive understanding of what type of ceasefires were happening, what were not, and what the nature and impact of the ceasefires were.

9.4 THE COVID CEASEFIRES TRACKER

To support the group's thinking, and to make information more widely available, we suggested building a small online interface for recording and exploring ceasefires. This was to become the Ceasefires in a Time of Covid-19 Tracker (PA-X Analytics, 2025d). Originally, the aim was to pull together all the information we had, to create a small dataset that would enable easier ongoing monitoring and public information and engage affected communities in contributing ceasefire information.

The PA-X team was able to offer to create the interface because we had designed a previous database to have a structure that could easily be repurposed and reused, namely, the PA-X Amnesties, Conflict and Peace Agreement Database (PA-X Analytics, 2025b) providing open access to Professor Louise Mallinder's data. The ceasefire data was able to use the same data model.

9.4.1 *Creating a Dataset*

Despite having information about COVID ceasefires and expertise to construct a coherent dataset, it was more complicated than we at first anticipated. It is not possible to simply ask—'is there a ceasefire, yes or no'. We found many reported COVID ceasefires that were technically armed group 'no first strike' policies. These may look similar to a ceasefire but involve unilateral commitments not to undertake armed action if none is taken against you. Yet, subsequently one group's 'no-first-strike' policy sometimes can induce an opposition group to reciprocate positively with its own no-first-strike policy, creating a mutual ceasefire in-effect. Defining 'what is a ceasefire' and classifying purported ceasefires therefore required conceptual definitions to fit practice.

The process of constructing information as data, deciding what the data pertained to, and thinking about how to define terms in turn revealed substantive research insights (Wise et al., 2021). Different groups were calling ceasefires for different reasons. Some were unrelated to COVID-19 or the UNSG's call and had been reached because of a particular moment in the conflict, perhaps in a country not much affected by COVID at that point. Some relatively inactive armed groups in low-level conflicts declared a ceasefire as a way of reminding the world 'we are still here, we are still fighting for our cause'.

Ceasefires in a Time of COVID-19 Tracker

An open-access tool that tracks ceasefires and related events, such as commitments to move towards a reduction in violence, that have occurred during the COVID-19 Pandemic. Produced as a collaborative project between PeaceRep Edinburgh (PeaceRep, 2025a), the Peace Research Institute Oslo (PRIO, 2025), the Centre for Security Studies at ETH Zürich (ETH Zürich CSS, 2025), Conciliation Resources (CR) (Conciliation Resources, 2025), MediatEUR (European Forum for International Mediation and Dialogue), and the United States Institute of Peace (USIP, 2025a), with contributions also from the UN MSU in the UN Department of Political and Peacebuilding Affairs (UN MSU, 2025a). The data is available: (a) on a timeline, which can be filtered by region, country, and declaration type; (b) through a search tool that displays information in entry boxes; and (c) on a map where it could formerly be triangulated with COVID-19 infection data. A formal write up of the tracker is in *The Lancet*, where it received interest from medical professionals in the field (Allison et al., 2020).

Interestingly, the complex question of whether ceasefires were related to the UNSG Call or the pandemic meant that we did not call the tracker the ‘COVID Ceasefire Tracker’ even though we use that name as shorthand. Some ceasefires were not responsive to COVID, and sometimes it was hard to tell what the motivation was. We therefore felt ‘ceasefires in a time of COVID-19’ was more accurate.

To make different types of ceasefire visible and searchable, we categorised ceasefires inductively as: unilateral, unilateral-reciprocated, bilateral, and multilateral. We also found that ceasefires were often only declared for specific durations of time—e.g., three months, at the end of which time armed actors sometimes ‘extended’ the ceasefire. We registered ceasefires as ‘temporary’ if a clear end date was stated but did not classify any as ‘permanent’ (because how long is permanent?).

We registered ceasefires as unilateral where they were made by one conflict party, and bi- or multi-lateral if they included some element of agreement between armed actors. If a unilateral ceasefire was reciprocated by a unilateral ceasefire from opponents, we marked these ceasefires

as unilateral-reciprocated, which meant that people could see that there was a de facto ‘bilateral’ element to the arrangements, even though made unilaterally.

To present the full picture we included an ‘Update’ category to include ceasefire extensions or terminations, so that viewers could find out if the ceasefire was still formally in place. We also included ‘related events’ as part of the picture of what was in force—for example when a government or group rejected the unilateral ceasefire of another group. The UNSG ceasefire call itself was included as a ‘related event’.

9.4.2 *Iterative Design and Co-creating with End Users*

When we tested the interface with the group, someone suggested that a timeline and a map, rather than a search tool, might be more useful to end-users. We had capacity to do both. We were able to use an online timeline tool from Northeastern University, Knight Lab, US (Knight Lab, 2025), designed for open access re-use and with no-code functionality. We could therefore simply share Knight Lab’s simple Google Doc tables, for people to input data. This created a quick and easy mechanism for cross-group collaboration.

However, we also developed computer code to customise the timeline for our particular needs, and a mechanism to import and refresh when a new ceasefire was called or an existing one terminated. The customization enabled different ways of moving through the timeline and exploring it by country, or by type of ceasefire. We also used our visualization capacity to put the data onto maps. We worked to create toggle mechanisms to explore types of ceasefire or regional patterns visually on the map.

At each point in design we went back to end-users—mainly those in the mediator support group, but also others in country field missions who are part of our own practitioner ‘ecosystem’.

We were not, of course, the only project producing COVID data and interfaces. Countries were all trying to match health capacities. As health dashboards proliferated, we learnt about ‘dashboarding practice’ from colleagues (see Falisse & McAteer, 2022). We all became connected through university COVID research funding initiatives. This wider research infrastructure supported us to situate our work in wider questions of how data is given meaning.

9.4.3 *Reuse and Repurpose: Futureproofing all tools*

For our main PA-X Peace Agreement Database, we had been developing an API, or ‘Automated Programme Interface’. APIs enable structured data to be made public and ‘readable’ by others elsewhere. An ‘open API’ means that others can automate pulling your data into their platforms. John Hopkins University infection data on COVID was at that point the world’s best COVID data providing world-wide monitoring (John Hopkins, University of Medicine, 2025). They made their API public with clear terms and conditions for how it could be used. We could therefore ‘pull in’ their data onto our ceasefire map, which we did in ‘bubbles’ that showed how and when ceasefires overlapped with infection levels. We thought this was interesting to do, although it did not in the end yield any startling insights (see further, Bhattacharya et al., 2021). The attempts gave us a new capacity to work with APIs.

9.4.4 *Funding*

Originally, we started working on this project out of our interest and wish to be relevant to attempts to end conflict and support pandemic relief. However, over time, we started to get funding for this and other work, from a mechanism called the Covid Collective (CC) (2025) that brought together a range of practical research projects across disciplines and institutions to support conflict and development interventions during the pandemic. The CC was fantastic, as it gave us a wider set of researchers and end-users to engage with. This funding also supported longer-term collection of the data than we could otherwise have managed. We kept collecting data until March 2022. At that point, we felt that there was no real relationship between ceasefires being called and a pandemic that had largely eased, so we brought the specific COVID ceasefire data collection to an end. Interestingly, Johns Hopkins also stopped collecting COVID-19 infection data from 10 March, 2023.

9.4.5 *Ceasefire Tracker Outcomes: Quick evaluation*

The Tracker was useful to enable a wide range of people to learn quickly what was going on as regards ceasefires during COVID. It proved more detailed and accurate than news reports.

The Tracker played a role in supporting in-country ceasefire efforts and provided further insight into long-term effects of short-term ceasefires. As double disruption means that conflict are less able to be resolved in a ‘comprehensive peace accord’, our work continues to consider how various types of humanitarian agreement create ‘islands of peace’ through initiatives such as temporary ceasefires, which might unwind aspects of a conflict that cannot be resolved through a comprehensive agreement, including in Myanmar and Ukraine (Adhikari et al., 2025; Wittke, 2023).

Remote information, such as our data, played a particular role in a pandemic that meant that international actors were less present in country than at other times. The Tracker remains useful to informing ceasefire construction more generally, and we have been able to use it to consider when and how ‘health ceasefires’ work and do not work by bringing this data together with other historic cases of ‘vaccine ceasefires’ (See Russell, Wise, & Badanjak, 2021). In the long term, there is little to no cost to keeping in place an historic dataset and tool that has ongoing relevance to conflict resolution.

9.4.6 *Doing PeaceTech: COVID Tracker Lessons*

The project indicates the different elements that the project had to have to be successful, all of which point away from understanding PeaceTech as a once-off digital ‘hack’, even when a discrete-use tool is developed:

Data collection and creating a dataset. Technical data collection had to be triangulated with ceasefire expert information and analysed to understand and classify ceasefires into a dataset. This research required bringing together ceasefire experts, information, and database experts, and creating relationships between them.

Focus on End-users. The project emerged from co-creation among practitioners of different types. Co-creation was necessary to thinking about why people might want to look at the data, in this case primarily because they would want to understand whether anyone was responding to the pandemic ceasefire call, and whether other ceasefires were being called, even if not technically ‘in response’, and could be supported.

Analysis of the data. Analysis was needed to understand what was going on and how and why ceasefires were agreed. Here again the connection between researchers and a practitioner group of experts

was invaluable because it supported better understanding of cease-fires that helped us categorise the data in ways that made sense of it. The data was then better able to provide answers to practitioner questions.

Visualizing. We had to design a visualization of the data that was intuitive to the same types of experts were engaging with, for which we needed capacity to work with visualizers and database designers. Clear ‘specifications’ must be designed, in language that technical partners understand, and processes of liaising through iterative design processes established.

Data ownership. We had to deal with the attribution of ownership. Here the data interface was produced at University of Edinburgh, but the group had co-created the data. We enabled joint ownership by making the ceasefire tracker able to be i-framed into any website, so that anyone in the group could ‘own’ the outcome institutionally. The joint ownership of the product was then acknowledged through use of logos rather than legal agreements, although getting organizational permissions still required a level of bureaucracy.

Reusing past design. The project was also enabled by previous technical work and ‘reusing and repurposing’, assisted by the ways in which we had designed past interfaces to be able to be re-customised for other uses. We also made the ceasefire tracker infrastructure reusable and it now feeds into other initiatives.

Low-code speed versus bespoke capacity. Moving fast was enabled by using cool ‘no-code’ tools from other projects, and from the fact that other projects had made their APIs open access with clear terms of use for having permission. APIs pulled through updated data in an automated way without us having to invest further time and work to update manually.

Funding. The fact that we received funding was also useful. A relatively modest amount enabled us to extend data collection and spend some time analysing it in ways that are useful for future pandemics or temporary ceasefires.

9.5 THE PEACEFEM APP STORY

The PeaceFem app aimed to support women seeking to influence peace processes and also arose out of collaboration in a practice-based project. The project was called ‘Enhancing Women’s Leadership for Sustainable Peace in Fragile Contexts in the Middle East and North Africa (MENA) Region’ (GIZ, 2025). This project brought together several project partners, including ourselves, under the auspices of UN Women. Its central purpose was to enable peace processes to be more successful and more inclusive of women, and more reflective of their needs and demands. You can see a fuller explanation of the project and what it achieved in Iraq, Libya, Syria, and Yemen at UN Women (2022).

As one element of this project, we sought to make data and knowledge on gender inclusion more accessible to mediators and to women—and of course to women mediators. In a previous partnership with UN Women, we had developed data on all the references to women and girls in peace agreement provisions in the PA-X Peace Analytics Peace Agreement Database in what we call PA-X Gender (Pax Analytics, 2025d). Women and mediators find previous drafts on gender useful when trying to influence negotiation process. But before borrowing from other processes they also want to know ‘how did those provisions get there’—what did women do to get their needs written into peace agreements? And ‘what happened next’—was the agreement successful, were the provisions implemented, and was the situation of women improved?

Answers to those questions are not simple or not easily quantifiable. However, Inclusive Peace (2025), a ‘think-and-do’ tank, had conducted case studies on women’s inclusion in peace processes, and another project, Towards Inclusive Peace (Monash University, 2025), had also designed women and peace process case studies with a quantitative dimension for assessing gender provision strength and data on implementation. To supplement our data, we reached out to collaborate with both of these institutions. The full story of how we brought all this data as a piece of research and what we learnt is told more fully by Laura Wise (2023).

9.5.1 *PeaceFem—What Is It?*

The result was the PeaceFem mobile app (PeaceFem App, 2025), which can be used on Android and iPhones. It illustrates women’s inclusion in peace processes around the world. PeaceFem provides information

about strategies women's rights advocates have used to influence peace agreements, information about the enabling and constraining factors that shaped the space they had to influence, and the text of the gender provisions in the peace agreements, along with an assessment as to how well they were implemented.

9.5.2 *Doing PeaceTech: PeaceFem Lessons*

The following were the lessons of PeaceFem, and they overlap with those of the ceasefire tracker.

End users. The project grew from practice-based connections with women seeking to influence peace processes across the Middle East, and a wish to have a small but very instantly accessible way to support women in peace mediation in this region.

Data interoperability and literacy. A key initial issue was what case studies to focus on, and whether we had data on all the issues across those case studies. In other words, what did our collective data allow us to do? What gaps existed? To what extent did we have data that could be matched across relevant case studies, and that also matched with the peace processes that were useful for women to have information about?

Iterative design process and complexity of contracting. On this project also we needed to bring together a team of practice-based technical, research experts, and end users. On the data front, this involved: ourselves (University of Edinburgh), University of Monash, and Inclusive Peace, who all held different elements of the data. On the technical side it involved an app-design team, a visual designer. UN Women was a funder and commissioner and supported the convening of end-user women mediators. We at University of Edinburgh also brought our 'bridging' knowledge as to how to connect data and digital innovation, including how to write technical specifications, and knowledge of the issues to be traversed technically and legally.

All of this was quite complicated in practice, as it involved a web of relationships between the three data providers in two continents, UN Women in a third, and an app design company based in India. Establishing any iterative design process was difficult.

Intellectual Property Issues. The three research organizations providing data, University of Edinburgh, Inclusive Peace, and Monash University, all had to sign licencing agreements with UN Women, who technically 'own' the app. For us, this was complicated as our intellectual

property includes not just our coding and country data, but the design of the relationships between them, which were built into the app. Getting the right licencing arrangements took time across partners, even though everyone's data was already open access and there was good will for it to be made available and used in this way. None of us could risk inadvertently creating an accidental intellectual property obstacle to continuing to develop and use our own underlying data in the future by accidentally giving away ownership of our underlying intellectual property.

Languages. It was critical that the app was available in Arabic as well as English, and ideally with capacity to add more languages in the future. The app design and navigation had to be one that worked not just reading left to right but also right to left. Having Arabic speakers on our team was really helpful. The content of the app needed to be translated—but so did the 'rubric' of the app's search terms, and this was something that was easy to forget.

Future proofing. All the partners wished to extend the app to include more case studies over time. We made sure technical specifications included provision of a 'back end' that was user-friendly to load new data. This meant thinking through all the components that a new country entry would need, such as the country map, and thinking through how new languages could also be added without further app design down the road.

In practice, the app attracted a lot of interest beyond the Middle East, so we updated it to cover other countries. We added new languages of French, Indonesian, and Burmese, these last two in response to women in Asia who had specifically sought the app. We had no further money for translations, so we worked to future-proof the back end to enable new languages to be uploaded in the future without further app design.

We found that personnel within UN Women changed over time, so that relationship had to be built over again with people that were less familiar with what the project was about, how to commission the work from the app company, or even the previous licencing arrangements for all our data. This type of complication is common when working with international organizations, and points to the importance of documenting the project as you go, across those involved.

In terms of developing the app further, we are limited by what is appropriate for an app to do. An app cannot provide a comprehensive data interface and information; it can only make short-form information accessible. It is also important to keep the download size usable for women

with limited data download capacity. If a tool is successful there can be a temptation to keep developing it. However, there is a risk of what those in the tech field sometimes wonderfully call ‘enshitification’. This is the process by which improvements render the tool less, rather than more usable.

9.5.3 *PeaceFem Outcomes: Quick Evaluation*

PeaceFem is downloaded by women all over the world and can be used online and offline. Many of the Middle Eastern peace processes for which it was designed sadly did not progress. While some still contain possibilities for agreement, it is also likely that women will struggle to be heard as the focus is on deals between armed actors or states. The app has a discrete and modest ambition. It is perhaps most useful in providing people drafting or lobbying on clauses with rapid information on similar clauses in other peace processes. It can support groups seeking to think ahead as to what types of issues peace agreements can address. The app also works as a ‘billboard’, both for the types of activism that women used and the types of provisions they were able to influence. While the app gives basic information, it contains clear links to underlying detail of the case studies and partner websites. Women can use the app as an entry point for a deeper dive into comparative material on the underlying websites. The app connected to the wider ‘Enhancing Leadership’ project that had ‘regional and global convenings’ of women mediators and peacebuilders regularly, which brought women together across countries to learn from each other, in what was in-effect a large global end-user group.

9.6 WORK FLOWS

To what extent do the COVID ceasefire and PeaceFem projects give an indication of a digital innovation ‘workflow’? I would suggest it is the following:

Co-identification of a problem. In our experience, we always in a sense co-identified issues that digital innovation might help address with people in the field. It does not work to say ‘we have a tool, how can we use it’. Neither can one be vague about what the digital tool aims to do, such as ‘we want to help end conflict during the

pandemic’. A more specific question such as: ‘how can we collectively monitor ceasefires during COVID and make the data available?’ is a better statement of a problem that digital innovation may be an appropriate answer to.

Identify to what extent you have information or expertise to address that problem. How good is your data, is it the right data, do you trust it, is that reasonable, and how could you improve it? Do you need to form new collaborations? In particular:

- What relationships of trust do you have with others who seem to have relevant pieces of information or data to bring to the table and can you find a way to collaborate?
- What are the ‘ownership’ and legal difficulties with bringing that data together? Are these solved by licences? Do you have organizational capacity or support to negotiate intellectual property and licencing issues? Can these issues be solved by simpler non-legal agreements on how the data will be presented and used and who will be acknowledged and thanked?

Identify the end-users and establish mechanisms of feedback. For us and our partner organizations, this is an ongoing process.

Work iteratively (again!). Improving digital tools over time, based on feedback from end-users leads to better results. This process requires thinking about whether and how your relationships with technical providers have been established and will be paid for over time.

Try to locate yourself into a wider ecosystem on the very specific subject/practice area, as well as within ‘PeaceTech’. In our case, it was vital for both PeaceFem and the Covid Ceasefire Tracker to be in a wider research and practice set of relationships with people in the areas of gender and peacebuilding, and ceasefire mediation. It was also valuable to be part of a wider research community beyond the peace and conflict community, interested in how dashboards, their visualisation, and ‘things to do with COVID’ were being developed at that time.

9.7 PRAXIS AND THE PEACE TECH ECOSYSTEM

Both projects were single-function projects. They were not going to transform conflict landscapes, but they were designed to provide a practical function. Yet for us the main challenge of both projects was how hard it was to get even apparently simple digital transformations to deliver and be useful!

Knowing you need different forms of expertise, finding the right experts and bringing them together to have a conversation across very different types of expertise with very different languages, and then delivering a good and useful PeaceTech product is in fact very difficult. In our experience as ‘PeaceTech entrepreneurs’, there are real obstacles and challenges at each stage. The projects I described above nearly fell at each of the little hurdles of inter-organizational conversation, licencing, contracting, and also because turning qualitative and quantitative data into a small usable tool is conceptually quite difficult.

9.8 CONCLUSION

PeaceTech often emerges as a complicated praxis of bringing together different forms of theoretical, practical, and technical expertise across tech and peacebuilding domains. It instantiates a new peacebuilding practice in ways that connect theory to inform future practice. While the wider PeaceTech ecosystem can be very important to connect to, you will often have to create your own immediate ecosystem—your own little garden as it were. This will involve experimenting in a responsive way. Sometimes getting from the ‘nearly there’ to the ‘clearly usable tool’ will take years of further development and work. Some projects will falter, but the failures will enable other projects. Other projects will deliver and thrive.

In other words, operationalizing PeaceTech is not simply a matter of applying digital tools to peacebuilding problems as the word ‘hack’ suggests, but rather a matter of building a praxis community capable of developing an iterative approach to digital design. The outcomes are not just focused on the impact on the conflict, but also on building capacities for peace.

Questions

1. How convinced are you by ‘one good thing’ projects?
2. Is there anything that surprises you about the stories?
3. Can you see other lessons from the stories?
4. Did these projects exhibit hacks, modularization, or retrofitting?
5. Have you downloaded the PeaceFem app? Do it!
6. How useful do you think PeaceFem app is? What are its limitations?
7. What do you understand PeaceTech praxis to involve?

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Conflict Early Warning Systems

Abstract Conflict Early Warning Systems, or CEWS, are our first example of a sustained systematic PeaceTech intervention. They are widely used across multiple institutions and contexts globally. These initiatives use a combination of big data, analytical platforms, remote sensing, and AI to provide state-of-the-art CEWS, either at a country-wide level or even globally. CEWS have a hinterland in intelligence practices. As regards their use as PeaceTech, the idea of better ‘early warning’ is linked to ‘conflict prevention’ interventions that might prevent war before it happens or help a country mediate an incipient crisis in a peace process before it breaks down. We examine CEWS and their limitations.

Keywords Early warning systems · Conflict early warning systems · Knowledge foundry · CEWS gaps

10.1 I PREDICT A RIOT

Once during what was called ‘The Troubles,’ I walked up a street in Northern Ireland with international visitors. As we got near the city centre, I noticed that lots of young men were lurking in an unusual way, around the sidewalks. While none were wearing balaclavas or other disguises, hats were being pulled lower and scarves higher. There were very few whose faces I could see. There were other subtle behaviours.

Looks between them, and a sense of ‘waiting’. I felt a sort of feverishness in the air. Suddenly I was on high alert. I looked up into the town and realised a march was taking place and the young people could be expected to oppose it. We were right at the border dividing communities and I suddenly knew: ‘I predict a riot’. It would not be serious but could injure people. Police—whom I could see up the street and were clearly prepared, could fire plastic bullets if things escalated. The chance that my guests would have been hurt was slim, but I did not want to take it.

I told my guests, ‘let’s go back’. Some were quite upset with me when I told them I would explain later. There was trouble as it turned out. No one was seriously hurt, but it was better not to be around it. Interestingly to me, my guests were surprised at my decisions and the explanation I gave. They kept asking ‘but *how* did you know that was going on?’ They told me they had not seen anything untoward and were most surprised. For my part, I wondered how they could not see what was so obvious.

Now I realise I could have answered: I was alerted by my in-built, highly sophisticated, Conflict Early Warning System.

10.2 CONFLICT EARLY WARNING SYSTEMS: WHAT ARE THEY?

It was not a hunch that triggered my anticipation of conflict; it was my expert local knowledge of conflict combined with observed data. This knowledge came from a life lived in conflict, from having been in similar situations before, coupled with wider political understanding of conflict triggers. Knowledge and local expertise combined to produce an ‘instinct’ that was predictive. You will have had similar instincts in similar situations, and re-examination may show they were based on knowledge and rationality, despite being experienced in the moment as ‘a feeling’.

I called my reaction a built-in Conflict Early Warning System (CEWS) and boldly claimed it to be ‘highly sophisticated’, because it is impossible to parse out all the relevant data sources I unconsciously drew on and the life-long underlying expertise that informed what looked like an unscientific ‘hunch’.

Nowadays we think of CEWS as technological, data-driven, and scientific. CEWS have been a holy grail of conflict analysis and a central PeaceTech enterprise. Technologies, such as those we examined in Chapter 3, promise a capacity to deliver a science of early warning drawing

on infinite and varied data, at speed, to provide automated systematic predictions of conflict. Can it?

Oftentimes the local person's highly sophisticated 'hunch' will be better at predicting local conflict than a high-tech CEWS, and in practice CEWS often rely on hybrid forms of information from both 'data analytics' and 'human expertise'. Nonetheless, CEWS are here to stay.

10.3 FROM EWS TO CEWS

Early Warning Systems, or EWS, provide early indications that something concerning is happening, based on assessing physical events on the ground and using that assessment to predict consequences. They are used widely to monitor weather, natural disasters, and climate change—a confluence of natural events can indicate that a major event might be imminent, such as a storm or earthquake. We usually think of EWS as both systematic and automated, and therefore scientific in some way. Yet they mostly depend on human responses to be effective. In the conflict area, they have started to be called 'Conflict Early Warning Systems' or CEWS, the term we will now use. A range of definitions can be seen in the box.

Early Warning System: “a warning system that can be implemented as a chain of information communication systems and comprises sensors, event detection and decision subsystems for early identification of hazards. They work together to forecast and signal disturbances that adversely affect the stability of the physical world, providing time for the response system to prepare for the adverse event and to minimize its impact.” (Waidyanatha, 2010).

Conflict Early Warning Systems are: Systems to alert people to the risk or onset of militarily violent conflict. Their specific purpose is, “to identify and trigger actions to reduce the onset, duration, intensity, and effects of multiple forms of political violence” (Muggah & Whitlock, 2022, p. 1).

World Bank CEWS definition: A process that (a) alerts decision-makers to the potential outbreak, escalation, and resurgence of violent conflict; and (b) promotes an understanding among

decision-makers of the nature and impacts of violent conflict (Defontaine, 2019).

Hague Centre for Strategic Studies CEWS definition: A CEWS warns specifically for the onset, occurrence, escalation, or resurgence of various forms of political violence (Sweijts & Teer, 2022).

10.4 CEWS IN PRACTICE

We have already encountered CEWS as PeaceTech in earlier chapters, but examples of how they operate as CEWS are useful.

Ushahidi (2025a). Do you remember Ushahidi in Kenya, in Chapter 5? The platform initially began as a response to the violence around the Kenyan elections in 2008. Effectively a Kenyan CEWS, Ushahidi now provides a software platform designed to collect and combine the information necessary to other CEWS. The platform has developed over time from “a simple Wordpress blog with dots on a map into an entire ecosystem of software and tools built to facilitate the work done by human rights advocates, journalists, election monitors and those responding to disaster and crisis” (Ushahidi, 2025b). It now enables data collection from multiple sources: SMS, custom embedded web surveys, email, smartphone apps, X/Twitter, and bulk data imports from CSV files. This data can then be presented in a range of ways (Ushahidi, 2025b).

Hala Systems, ‘Sentry’ (Hala Systems, 2025). This system in essence triangulates data from sensors in the ground, crowd-sourced information about attacks, and the light paths of aircraft from open-source platforms, to provide information on attacks in Syria. It employs technologies that have overlapped with Ushahidi, such as smartphone apps for reporting sightings of planes, but also uses remote sensing and AI algorithms to triangulate and verify information. It communicates warnings through an ‘insight portal’ with situation awareness, collaboration tools, and geospatial analytics, not just to ‘inform’ a range of actors that they may need to take action quickly, but to *integrate* civilians, local responders, and global stakeholders.

The Sentinel Project (Boyd, 2015). This CEWS starts with alerting people to a ‘situation of concern’. It has produced a ‘conflict tracking

system' that is publicly available. The focus is on identifying risk of genocide and conducting 'operational process monitoring' regarding a possible evolving genocide. However, the project states an ambition for two more CEWS-type tasks: first, a vulnerability assessment that would be able to identify country characteristics and all the actors within a 'situation of concern' to identify the vulnerability to attack of key communities. Second, in the case of a predicted genocide, Sentinel predicts how severe it is likely to be (building upon information from the vulnerability assessment), and what the most likely perpetrator courses of action are—all designed to support responses. In practice, this work is still in a form of inception.

Strata (2025). A 'sister' project at University of Edinburgh, Strata is an 'Earth Stress Monitor' developed with the UN Environmental Programme (UNEP). It monitors not just climate impacts, but also security vulnerability. It is not strictly an EWS or CEWS but does use algorithms to show 'hot spots' where multiple risks coincide and people reside, and so points to places to pay close attention to. In marrying conflict and climate risks, the tool points to the need to understand multiple forms of conflict and climate risk together.

Beyond these examples, there are multiple diverse CEWS: this is a fast-proliferating field, often driven by research projects and non-governmental organizations. It is also a key focus of governments and regional and international organizations often for their own intelligence and operational purposes. The following list provides links to other examples, although is not exhaustive (for good overviews see Hegre, 2022, Hegre et al., 2021, Rød et al., 2024, and Sweijs & Teer, 2022).

Atrocity Forecasting Project (AFP) (Australian National University, 2025): aims to enhance forecasting of mass atrocities, performing in essence a 'Research and Development' function for CEWS (Butcher, et al., 2020).

Conflict Forecast (CF) (2025), an FCDO-funded project that forecasts 'outbreaks of political violence and escalations into internal armed conflict' (Mueller & Rauh, 2022a, 2022b, and 2018).

The Comprehensive Planning and Performance Assessment System (CPAS) (UN Peacekeeping, 2025), a UN system for supporting adaptive management in UN Peacekeeping missions. An example of a long-term foresight tool, as it supports long-term assessments as to how missions are going and how to improve them, rather than immediate 'early warning'.

Preview, German Government, includes a conflict forecasting component (for description see, Bressan, 2021).

The Violence Early-Warning System (ViEWS) (Uppsala Universitet, 2025), provided by the Uppsala Conflict Data Programme, generates monthly predictions of the number of fatalities in impending state-based conflict 1–36 months ahead, and probabilistic assessments of conflict (Hegre et al., 2019).

UN Situational Awareness and Geospatial (SAGE), United Nations (see Druet, 2021), a computer-based reporting system that supports an event database including enabling UN peacebuilding and peacekeeping operations and staff to categorise incidents in real time. It is powered using the Ushahidi software and is able to ingest a very broad amount of data including data that is structured, unstructured, quantitative, qualitative, and visual.

ACLED Trendfinder (2025a), tracks conflict surges, as part of the ACLED conflict data suite of datasets (ACLED, 2025b).

The UN and regional organizations all have forms of CEWS, as the box below illustrates.

UN and Regional Institutional CEWS

UNDP Crisis Risk Dashboard (2025)

AU Continental Early Warning System (2018)

EU Early Warning and Information System (EC, 2025)

EC, INFORM (2025)

10.5 WHO DO CEWS ALERT?

CEWS do not just warn for warning's sake. They aim to produce a response in a range of different actors (not necessarily all targeted by a single system), which can include:

Humanitarian agencies, alerted to the possibility of humanitarian consequences of conflict such as death or injury, hunger, new health needs, or mass movements of people. New humanitarian interventions can then be staged.

The diplomatic community, alerted to support local crisis interventions and forms of diplomatic or military or humanitarian intervention, or to plan to evacuate their own nationals. Anticipatory diplomatic responses may be particularly important if the nature of the conflict is such that it could trigger ever wider international conflict, for example, if it breaks out along a border or involves allies of a powerful geopolitical power, such as Russia, China, or the United States.

Local communities, alerted to move civilians out of harm's way, to operationalize their own community responses to violence, to assist those in flight, or even to conduct forms of mediation. As my own story indicates, local actors may in fact have had even 'earlier warning' of the conflict than technological CEWS provide.

Military actors, alerted to produce a range of military responses across quite different types of forces. Responses can be framed as counter-aggression, self-defence, community defence, or civilian protection. We may think of some of these responses as peaceful and some as conflict, so again, CEWS may be 'modular' and part of both PeaceTech and WarTech.

Are CEWS PeaceTech or War Tech? They perform PeaceTech functions when focused on 'conflict prevention' and peace process implementation. However, they are really 'Conflict Early Warning *and Response*' systems, and responses can also be military as Owen's story illustrated. Arguably, their origins are in SecTech or WarTech, and they are adapted as module to peacebuilding, rather than vice versa.

10.6 VARIATION IN CEWS

While the examples above are all CEWS, they illustrate the variety in how these can work. The examples all have different approaches to:

- the purposes and drivers of the CEWS
- the time horizons over which they warn
- the decision makers they seek to reach
- the methodologies and technologies for gathering, processing, and presenting EW information

- the geographic scope the CEWS covers, from specific countries or areas within them, regions, or ‘the world’

Let us examine further.

10.6.1 How Early Is Early? Variation in Time Horizons

CEWS operate to warn on different time scales, from warning about immediate threats to more future-oriented ‘horizon scanning’, and these link to the different conflict prevention tasks they aim to serve.

Nowcasting: warning about the emerging and ongoing. Ushahidi in its original incarnation offered an example of a ‘what’s happening right now’ system. It was designed to warn people of where they should go and not go in the moment. Hala works somewhat that way too with a focus on enabling civilians to protect themselves. Of course, a wider range of more structural responses to violence may also be enabled—in the case of Ushahidi’s initial work in Kenya, perhaps community responses to violence or mothers making sure teenagers and kids did not go and join in. Crisis Group has a Crisis Watch (2025) conflict tracker that it talks of as a ‘nowcasting’ tool because it tells people what is unfolding that may require a response.

Nowcasting may be so ‘now’ that it does not support timely intervention. Other purposes are also claimed for some nowcasting CEWS, in what can seem like a form of hedging. Hala notes that its system is not only about warning but is also about ‘accountability’ after-the-fact, because it documents attack details that can potentially provide a basis for any international assessment of human rights violations and war crimes in the future. Other initiatives, such as Sentinel above, similarly claim to really be about post-hoc accountability, although they offer a CEWS dimension.

Medium-Term Adaptive management – warning about the risks of conflict onset. Other systems aim for a more medium-term prevention planning capacity by trying to anticipate and respond to possible conflict challenges further down the road. These types of systems aim to inform future-planning processes at an organizational level. UN’s CPAS, for example, focuses on adaptive management in peacekeeping missions, complemented by SAGE, which provides support for an immediate incident response. Interestingly, although both are UN peacekeeping

innovations, the systems do not operate simultaneously in all missions and are not integrated as one platform.

Futures horizon-scanning—warning about long-term risks and conflict trajectories. Longer-term approaches to CEWS aim to anticipate conflict dynamics and scenarios well down the road. This type of system shifts the methods from immediate assessments of how conflict is unfolding, or even medium-term adaptive management, to help ‘scenario plan’ to address some underlying structural drivers of conflict that may need strategies for change. This type of approach is often embedded in governmental and international systems such as SAGE, Preview, and CPAS.

Do-It-All (DIA) Systems. This is my term and reflects that CEWS are increasingly being brought together with a range of other digital tools to address instability. These systems do not just warn, but also provide advice as to short-, medium-, and long-term responses, and also support quick access to good practice guides to support responses. For example, the United States has been developing an Instability Monitoring and Analysis Platform (Instability Monitoring & Analysis Platform, 2025) to enable policymaking in line with evidence. It aims to make open-access data and technology widely available through US government departments ‘to inform U.S. strategies, policies, and programs on conflict prevention and stabilization.’ While DIA Systems sound attractive in terms of efficiencies, they run counter to the ‘do one good thing’ approach and risk making so much data and analysis available that the right information at the right time, particularly when a crisis erupts or seems imminent, remains difficult to access.

10.6.2 *Who Are the ‘Decision-makers’*

Different CEWS are used by different organizations and therefore differ with regards to the relevant ‘decision makers’ they attempt to reach. For example, Ushahidi and Hala aimed in their initial incarnations to reach ordinary citizens, providing information to avoid violence, to Kenyans seeking to avoid electoral violence, and Syrians to avoid conflict violence, respectively. However, Hala’s system also required consideration of how information should be verified and documented for any future criminal process, and this design responds to the professional needs of lawyers.

Some systems are specifically organizational, such as the UN’s SAGE and CPAS for peacekeeping operation support, or the United States’s

IMAP. They aim to reach political decision makers involved in decision making to support UN peacekeepers or political mission planning.

Muggah and Whitlock have drawn a distinction between ‘first mile CEWS’, which are people-centred and bottom up, and ‘last mile CEWS’, which focus on threats communicated from the top down (2022, p. 8). Hala and Ushahidi are ‘first mile’ and SAGE and CPAS ‘last mile’. Muggah and Whitlock use this spatial reference to indicate proximity to people affected (first mile) and proximity to international responders (last mile). These are two different sets of decision makers, whose time needs and response capacities are different.

10.7 DIGITAL INNOVATION, AI AND CEWS

Differences of purpose, timing, and in the types of decision makers to be supported often drive the types of CEWS innovation employed. However, each element of CEWS design presents challenges.

10.7.1 *Digitally Supported Innovation in Theories of Conflict*

All data must be linked to a theory of conflict, which informs the attempt to analyse and predict what the data might point to happening next. A key difficulty here is that there is no definitive academic or other answer to ‘what causes conflict’ (for an accessible overview of theories see Overy, 2025). Very different types of methodology such as political analysis of context, historical analysis, economic analysis, anthropological analysis, and psychological analysis have been used to examine the issue of what causes conflict, and each come to different conclusions. Often these theories vary crucially as to whether structural factors determine conflict or if the decisions, choices, and actions of key people do. Increasingly, data-driven innovation looks for historical correlations between structural causes for which data exists and the outbreak of war and tries to bring these together to form a predictive tool. However, not all structural causes are easy to measure, or have reliable data. Also, relying on structural causes that correlate with conflict onset leaves out causes rooted in human agency, although developments such as using large language models (LLMs) are providing innovative ways of bringing quantitative and qualitative data together to improve prediction (see e.g., Mueller & Rauh, 2022a, 2022b, 2018).

10.7.2 *Innovation in Data and Analytics Used*

It is difficult to generalise about the data used in CEWS due to the variation illustrated by the examples.

Contemporary CEWS use multiple sources of information together with predictive data analytics often supported by AI. While statistics or ‘descriptive analytics’ tell us what a situation is, predictive analytics try to use a range of techniques of analysing data to predict what might happen next. Both ordinary and generative AI go further than prediction and can give forms of prescription as to ‘what to do next’ (see further Chapters 13 and 14).

The data in CEWS can be quantitative data about conflict or structural conditions that are often associated with conflict, such as poverty. Data can include unstructured data such as perception data, gleaned from social media analysis, reports, expert surveys, web-scraping news channels, organizational reports, or crowd-sourced data, such as reporting by people as in the Ushahidi example or remote-sensed data used by Hala. Not all CEWS are data-driven; some use more ‘old-fashioned analogue’ methodologies. For example, Crisis Group’s Crisis Watch unusually uses expert analytical assessment to create an interactive crisis map. The range of possible data for CEWS creates the possibility of millions of data points—in other words ‘big data’. However, the data needs theories of what causes conflict to create multi-factorial models capable of prediction.

10.7.3 *Innovation in Data Gathering Tools*

Digital transformation has also re-shaped the ‘data gathering tools’, as has already become apparent. SMS surveys, or tools such as KoboBoxTool, enable large-scale survey and analysis of information, all with a level of online-offline capacity useful both to low- or no-bandwidth settings, and useful also to security, because surveys can be beamed off the phone, or pad devices used in the field. Webscraping of news stories, or X/Twitter feed or other social media, all now feed into CEWS. A range of innovative tools operate within missions to enable people to log incidents in ways that automate their integration into the analysis and visualisation of the CEWS. Druet’s detailed description of SAGE provides an example of just how diverse the types of data drawn on can be (Druet, 2021). Where large-scale population data has been collected, including biometrical data such as iris scans, electronic finger-printing, or facial recognition, or other

forms of remote-recognition such as car-license plate recognition, that are all forms of ‘intelligence’, this data can also be used in CEWS although requires safeguards.

10.7.4 Innovation in Statistical Techniques

Ongoing refinement and development of statistical techniques for CEWS purposes is also the subject of ongoing innovation. While well-established statistical methodologies of prediction continue to be used, the area sees increasing methodological experimentation. CEWS essentially create models based on relationships between data and conflict onset in historic cases. Methods generate considerable academic debate, evaluation, and experimentation (see e.g., Khan et al., 2024).

The Global Urban Analytics for Resilient Defence (GUARD) project of the Turing Institute, for example, uses ‘spatial interaction’ theory, including data such as number of people killed at major road junctions, for predicting conflict (The Alan Turing Institute, 2025). Guo, Gleditsch, and Wilson, the project’s creators, have used deaths-in-conflict data, such as that mentioned earlier of ACLED and UCDP, all geocoded in space, to overlay it with other quantifiable information relating to political dynamics, and set it on a map, to attempt to predict where conflict will occur next (see further Guo et al., 2018).

A developing approach to CEWS focuses on conflict diffusion, rather than conflict onset. These CEWS predict how a conflict that has started can be predicted to diffuse across a country or other geographical space. This type of analysis requires further statistical innovation (see e.g., Racek et al., 2025).

10.7.5 Innovations in the Communication of Risk

Other digital innovations have focused on connecting the CEWS information to decision makers. Big data and systems often use dynamic interactive dashboards or interfaces, such as the platforms of SAGE, Sentinel, and CPAS to communicate with end-users of the CEWS. Some will be built using software such as Microsoft Power BI, and others using conflict-tailored software such as Ushahidi. Knowledge foundries, discussed below as ‘do-it-all’ systems, are another innovation, which take the idea of a ‘dashboard’ to a bigger scale to provide not just data insights

but predictive analysis, prescriptive advice, and capacity to jump between different types of data to access different types of insight.

10.8 WHAT DOES IT TAKE FOR A CEWS TO WORK?

On 14 April 1912, when the *Titanic* hit an iceberg, naval architect Thomas Andrews from Ballymena, Northern Ireland (not far from where Marconi had broadcast the first transatlantic wireless signals), the designer of the Belfast-built ship, was on board. When he heard the extent of the damage, he knew categorically from past calculations that the ship would sink. He also likely knew there was insufficient lifeboat capacity to save all those on board. Both pieces of information involved solid numerical data. A signal was sent immediately to nearby ships. One, the *SS California*, was only five miles away and saw distress flares and received a radio signal. However, it did not respond. Two inquiries—a British one and a US one—found that had it responded, all those lost at sea could have been saved. Another ship, the *Carpathia*, was fifty-eight miles away and navigated the ice fields to arrive three hours later—after the *Titanic* had sunk. It saved the lives of over 700 people in lifeboats, but over 1,500 people had already perished in the sea.

Those in charge of the *SS California* either misinterpreted *Titanic*'s signal as not signalling imminent distress or decided not to risk travelling through icebergs.

However, the *Titanic*'s distress call was not the first 'early warning' of the evening. Earlier, the *SS California* had stopped amidst the ice field and sent a warning to other ships nearby of the extent of icebergs—another EWS. Miscommunications on the *Titanic* meant that this warning did not reach the bridge, and the ship did not stop or drop its speed as advised. Instead, it powered on to its fate—another EWS gap.

Andrews, who was in fact our family relative, went down with the ship, along with other relatives. Some years later the two nearby boats were themselves to sink as casualties of war, sunk by German U Boats (submarines). The *SS California* was requisitioned for the First World War in 1915 and sunk in the Mediterranean, where its remains were never found. The *RMS Carpathia* was also requisitioned and in 1918 was torpedoed and sunk off the coast of Ireland.

The *Titanic* illustrates how early warning gaps open between warning and action. The first warning of icebergs could have prevented the ship being fatefully damaged. The second warning that the *Titanic* was about

to sink could have resulted in a more successful rescue operation. But the seriousness of both communications was not fully appreciated, not fully communicated to the people with decision making power or not taken seriously by them when it was. The warnings did not therefore trigger the necessary decisions for action.

The two nearby ships also in a sense fell victim to early warning gaps. The First World War that sank them was widely anticipated, but exactly who would fight who was not always clear. It began as a set of conflicts and decisions, in different places for different reasons, and over time the conflicts became almost accidentally networked and amplified into a global war (Clark, 2013). We tell it as a story of a ‘World War’ with a clear start and end, but it was really a story of a conflict system that was allowed to evolve. The multiple conflicts within the system required multiple treaties over several years to fully end the conflict. It is striking how many of today’s conflict hot spots link to the conflicts and peace decisions of that era.

CEWS gaps between warning and action often arise in the conflict field. The nature of conflict makes the link between information and action more difficult. An increased iceberg risk can sensibly lead a ship to stop or cut its speed. But a conflict risk, communicated as a risk, poses a more difficult question as to ‘what can be done to prevent the risk materializing’. Decision making involves balancing forms of risk that are difficult to calibrate. Diplomatic responses may be deployed, as they were during the lead up to the First World War, but other forms of response such as the use of force, are themselves high risk, and the chances of success for any intervention may seem low.

On the Titanic, it was a junior signal operator’s warning that was not taken seriously. Research has since demonstrated that the seniority and reputation of the person communicating the warning can determine how seriously a warning will be taken, more than the reliability of the information (De Meyer et al., 2019, p. 273).

For a CEWS to work as a peacebuilding measure, it would need to provide the following:

- **Reliable indicator.** Provide an indicator that violence is escalating or is about to escalate that is reliable and trusted because it is based on
 - Reliable analysis of what predicts conflict, and

- Appropriate and accurate data
- **Good communication.** Communicate information effectively to people in a position to influence whether violence develops or not.
- **Connect to decisions.** Connect to those people's mechanism of decision-making for intervening to stop the violence.
- **Produce responses.** Prompt responses that are effective in preventing conflict.

If any part of the chain breaks, the CEWS is unlikely to be preventative of the conflict as a whole, although it may ameliorate its effects, for example by moving people out of harm's way. Certain things need to be in place for each stage to be successful, and if any element is missing the chain to action breaks.

Reliable Analysis of what predicts conflict. Knowledge of what causes conflict is limited. As we have touched on, there is consensus about factors that are linked, but no real academic consensus on how and when they combine to cause conflict. Conflict events such as killings or bombings might indicate that more conflict is on its way but may not. Similarly, 'disagreeing about the sovereign status of a region' might cause conflict, or 'poverty' might cause conflict, but neither of these things predict conflict, because there are many instances where disputed status of a region, or poverty, have not caused conflict. Any predictive analytics capable of providing a CEWS, will find it difficult to decide what factors to explore correlations between, and what predictive conclusion to draw from them.

Even where good analysis exists, it may not be easy to combine possible relevant conflict triggers into a predictive methodology. Often political analysis of what causes conflict will have to be translated into some sort of algorithm that works with quantifiable data. A wrong calculation will lead to inaccurate prediction. Plus, one might be sceptical about explanations for conflict that do not factor in the unpredictable factor of human agency. Without going into the many deep and complex debates, it seems clear, to me at least, that some sort of complicated combination of structural conditions and the agency of armed actors, determines whether conflict results. It feels like a leap of faith to think that probabilistic data based on quantifiable drivers of conflict could produce completely accurate prediction.

Appropriate and accurate data. Knowing what to measure, and how to compute the measurement, can still leave a difficulty of what measurements to use. Even if we know what factors can be used to reliably predict violence, we need capacity to monitor and collect data on those factors. The problems are legion.

Deaths in conflict, for example, would seem critical to conflict prediction in an immediate sense, and in principle deaths in conflict seem quite a certain thing to measure. However, counting such deaths is a massive, complex undertaking. It requires both defining what is ‘in conflict’ (does it include the person who had a heart attack when they heard about their relative’s death or not?). It also requires a methodology for counting the deaths in question. For example, both ACLED and UCDP measure ‘deaths in conflict’, but they define conflict in different ways and use very different methods to ‘count’. UCDP defines conflict in terms of warring groups that have a publicly stated ‘incompatibility’ (or dispute) and uses two verified news sources to count deaths in desk-based review. ACLED counts different types of violent death—through protests, or shootings, using both traditional media and a network of in-country experts. This means, for example, that for UCDP much of the cartel drug violence in Mexico is not conflict, and for ACLED it is. Both methodologies are thorough and valid, but the methodologies are different and will produce different results (Cf. further Raleigh et al., 2023; and Öberg & Yilmaz, 2025). CEWS, of course, may use both data sources, but we may not know exactly how they are used to provide any predictive analytics and therefore may not easily be able to assess how different methodological choices affect the prediction.

If we move from ‘deaths in conflict’ to a range of other conflict-relevant data, such as the level of corruption in a country, the levels of relative poverty, or something like ‘the belief your situation can improve’, how reliable data is becomes even more challenging. Moreover, apart from deaths in conflict data, most other relevant data is ‘slow data’—produced annually and only capable of tracking slow-moving processes of change. Whether data is ‘fast’ or ‘slow’ affects the type of conflict prediction it is useful for.

Good communication of risk to decision makers that have capacity and will to respond. In the field of conflict, a more common gap arises in the lack of political will or capacity to respond. In Srebrenica during the conflict in Bosnia and Herzegovina, what has since been called a ‘slow genocide’ occurred over months, and eventually atrocities were

committed in sight of UN Peacekeepers. Yet nothing was done to intervene, due to a range of factors that constrained the political will of peacekeepers on the ground and their political bosses back ‘at home’. This was not a failure of warning but a failure of the will to engage Peacekeepers in fighting genocidal military chiefs, or to use aerial bombing, or other forms of intervention (for an account of the genocide see the chilling record in the International Court of Justice, *Application of the Convention on the Prevention and Punishment of the Crime of Genocide (Bosnia and Herzegovina v. Serbia and Montenegro)*, 2007).

If any one of these issues gaps arises, the CEWS will be rendered ineffective, or worse—counter-productive.

10.9 NEW GENERATION CEWS: AI HOCUS-POCUS TECH?

There are signs emerging of a new generation of CEWS that promise to overcome the warning-response gap by connecting data to more rapid and on occasion automated decision making.

These are systems that claim to apply deep machine learning and AI ‘to generate increasingly parsimonious assessments that are, crucially, then matched to a range of possible real-time decision options elucidating their inherent risks and payoffs’ (Muggah & Whitlock, 2022, p. 4). In other words, they claim to link automated predictive analytics with automated decision-making responses.

A range of ‘knowledge foundry’ systems now claim to be able to absorb and crunch a massive range of structured and unstructured data. For example, Palantir (2025a), which is listed in NYU CIC’s ‘PeaceTech’ ecosystem mapping, is one such company, and already has provided services to the United States/NATO in Afghanistan as well to multiple police forces.

When I say ‘purport’ to do this, a key issue is that often exactly how the algorithms work is not entirely clear, including: what data is being fed in; whether there are firewalls between data given for different reasons and projects; how the algorithms are used to make determinations; how and when they trigger an automated response; and when human decision making interacts with automated response. The phrase ‘connect to real time decision making’ also rather glosses over what those decisions might be. Customising these systems to particular contexts is also very expensive work. Palantir, for example, did not make a profit between its founding

in 2003 and the first quarter of February of 2023, despite high revenue (Capoot, 2023). In the last two years, however, it has made profit of \$210 million and \$462 million.

Palantir has innovated further, in particularly by taking AI ‘to the edge’. By that they mean off the cloud and into machines such as drones or remote sensors, which can then communicate directly with each other (see Palantir, 2025b). This move has the advantage of reducing ‘latency’—that is, the time taken for information to be exchanged. Remember the cloud/edge distinction? The push for faster analytics involves embedding artificial intelligence into machines themselves to enable faster, more automated responses. Edge AI can mean having the algorithms calculated in drones, planes, submarines, satellites, and remote sensors, which communicate directly with each other to process information and do calculations and make decisions faster.

Taking AI to ‘the edge’ involves stripping it down so that it can work in low-code environments with things like battery energy sources that are not limitless. Not everything that is possible in ‘the cloud’ is possible at the edge, posing the question: what might go missing and how does one evaluate what is lost in the process? Moving AI to the edge has energy reduction dividends. However, it is also a move that enables automated decisions without human agency or decision-making. Palantir gives the example of increased satellite imaging being automatically triggered if a ship or vehicle changes position (Palantir, 2025b).

10.10 RISKS

At PeaceTech conferences, new forms of CEWS abound. Some will disappear and others will be incorporated into existing companies and digital platforms. There are clear risks, such as personal data gathered for CEWS being used to support warmaking. For proponents of PeaceTech, ‘first mile’ initiatives focused on civilian protection are perhaps the most persuasive form of CEWS. However, these have their own risks, such as lack of inclusion (remember Aker’s criticism of Atem’s app), unpredictable outcomes (remember Owen’s story of armed forces intervening after an early warning), and vulnerability to cyber warfare. We return to these risks and the frameworks emerging to address them in Chapter 16.

In my view, a major risk of CEWS is the risk that the focus on prediction distracts from a focus on ‘what to do next’.

To a striking extent, the explosion in CEWS capacities and platforms has coincided with the era in which the largest and most dangerous wars on the planet all came with relatively little to no warning from the top intelligence agencies of the world: Ukraine, started by Russian's invasion; Myanmar, started by a military coup; Gaza, started by Hamas incursion; Sudan, started by a new battle between Sudanese Armed Forces and the Rapid Support Forces in Khartoum; the India-Pakistan border conflagration—short but dangerous given that both are nuclear powers. While war could have been expected in all these places at any time, the specific moments of flare-up seemed to be predicted only a few days or hours in advance, if at all. Only in the case of India and Pakistan was diplomacy immediately unleashed that was successful. The others have proved unsusceptible to diplomatic or military intervention, whether for reasons of political will or capacity.

10.11 CONCLUSION: FROM CEWS TO PEACE EARLY WARNING SYSTEMS?

CEWS are here to stay. Their future direction seems to involve innovation in:

- Types of data-collection tools and diverse types of data that can be incorporated
- The data science of prediction
- The ways of communicating that data back to end-users in ways that enable and support and even prescribe decision making
- Creating connected automated data collection and automated decision making, in ways that are deeply decentralized and happen between pairs of machines, using 'stripped-back' artificial intelligence
- Using generative AI to make advice from machines 'more human' and perhaps more plausible

Should we also try harder to predict peace? Social scientists, peace-builders, and militaries are strikingly bad at this. Interestingly, they are often more doom-and-gloom than is warranted because they are better at predicting continuity than change (Cox, 1998). There is much less attention on 'Peace Early Warning Systems' or PEWS, although some nascent examples exist. Crisis Watch, for example, puts peace talks on its map and

the United Nations Development Program has a ‘Social Cohesion and Reconciliation Index’ (2015). Didi (2025), a small-scale pilot initiative, aims to use newspaper accounts of conflict and other open sources to try to use Zartman’s theory of ‘ripeness’ to determine when a situation might be ripe for negotiations (see Zartman & Berman, 1982).

Does it matter that we do not have many PEWS, or are they just a nice idea but not necessary or useful? In my view they matter. If you are a civic actor in Yemen, it might be important to know what type of ‘peace’ might emerge if Saudi Arabia negotiates secretly with Houthis regarding the fate of your country and life. It might be important to a UN Resident Coordinator’s job to know if the country’s landscape is going to change and he or she will suddenly be managing a peace process. It might be important for a range of organizations to be able to react quickly with forms of confidence-building measures when a ceasefire seems possible or has been reached. But more than all that, it might be important to ‘see’ more clearly the projects of civiness at play in a country to understand the possibilities, constituencies, and conditions that are conducive to de-escalating conflict and enabling change. As my beginning example of my own ‘hunches’ illustrated, civic actors are often under-estimated sources of otherwise hard-to-reach data—they are lifetime experts in ‘the field’ that is their home country context.

Why do we map conflict events but neglect mapping dialogue processes, or mediation efforts even after the fact when risk of damaging them is over? Why do we not think about when peace processes are ‘active’ or might ‘break out’?

I suggest that in the world of double disruption, peace initiative mapping is even more important than before. Our own work has shown the multiplicity of peace-mediation efforts in the field, and new forms of diplomatic architecture such as ‘contact groups’ and ‘mini-laterals’ are now emerging (see also Whitfield, 2025), which sustain and attempt to deal with fragmentation of both the conflict and the peace mediation space. There is a need for good research capable of producing agile ‘intelligence’ on how this scattered approach of ‘multi-mediation’ (Bell, 2024) is operating in practice and how it can be brought into some sort of fast-paced strategy to prevent and end wars. While CEWS remains a profitable and ‘sexy’ area to invest energies, someone needs to work on ‘what to do once warned’.

Questions

1. Have you had an instinct in a situation of what would happen that you can now examine and see was rooted in knowledge and rationality?
2. How much do you ‘believe’ CEWS can be effective?
3. Which use of CEWS, such as nowcasting, medium, or long-term forecasting, seems the most useful?
4. Why do we map conflict and create multiple CEWS, and not map peace dialogue, or have even one PEWS?

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CHAPTER 11

Peace and Space

Abstract Geographic Information Systems (GIS), geo-coding, and remote sensing are other key digital innovations that offer PeaceTech transformation of scale. Satellites are one form of ‘remote sensing’. The images they produce comprise geo-spatial data, which can be part of a ‘Geographic Information System’ or GIS. This chapter examines the use of GIS in conflict prevention and peacebuilding, focusing on the importance and challenges of mapping peace and war.

Keywords Geographic Information Systems · Geocoding · Remote sensing · Space

11.1 WAR AND PEACE

Then... In 1502 Leonardo da Vinci, whose ornithopter is on the cover of this book, was working as a military engineer, a job he took at age thirty and would hold for seventeen years. While we remember him as an artist-scientist, he considered himself skilled in the art of war and created multiple technical drawings of new forms of weaponry. During the wars fought between 1499 and 1504 over control of Italian city-states, da Vinci found himself in the town of Imola with his boss at that time, Cesare Borgia, a nobleman, cardinal and, after retirement, a soldier for

hire. Borgia had ‘taken’ Imola in a war campaign of 1499 along with the city of Forlì (Encyclopedia Britannica, 2025b).

While in Imola, da Vinci was tasked with helping Borgia learn more about the town’s layout. He created his ‘Plan of Imola’—a kind of bird’s-eye map of the town using cutting-edge survey techniques and artistic imagination (all maps are ‘representations’). Da Vinci’s Plan looks remarkably like a satellite photo, with a three-dimensional effect. It is highly accurate when compared to the earliest aerial photos of the town. The map was significant, as it helped develop the very idea of cartography because it showed that maps were not just imaginative art but could be sources of information (see the plan at Chung, 2019). Da Vinci was to go on to create many birds-eye view maps, both because he was asked to and because he had ingenious engineering projects he wanted to explore that needed the maps. A video by Vox Almanac (Vox, 2019) also helps explain the Plan’s genesis. Da Vinci’s Plan was an early example of ‘WarTech’.

Now... Today, Planet Labs (2025) offers Dove ‘satellites for peace’. The satellite name is interesting. As their website in 2023 explained:

In the aerospace industry, satellites are typically referred to as ‘birds’. From the ground, it looks like they are flying across the sky as they travel along their orbits. There’s also a tendency in the aerospace industry to think of these satellites as birds of prey; satellite missions like FalconSat and Kestrel Eye bring to mind a circling hunter ready to swoop down and strike. Not so fun. (Safyan, 2014).

In contrast, Dove’s mission is,

to utilize space to help life on Earth, and that attitude permeates everything we do. These are peace-bringing satellites, enabling commercial, humanitarian, and environmental applications at a scale that has never been attempted before. We call our satellites ‘Doves’ so that the message is loud and clear. **Do good, foster peace, and take better care of our planet.** We’re focusing on applications such as deforestation monitoring, disaster response, improvements in agriculture, the list goes on. (Planet Labs, 2025, emphasis in original)

Subsequent new Planet Labs satellites have been called Owl, Pelican, and Tanager.

Planet Lab’s mission is PeaceTech-related, using the term in its broadest sense. Their satellites are used for monitoring both conflict and

factors related to it (meaning they note ethical concerns regarding what is made public).

Planet Labs' 'unique selling point' is that they launch millions of tiny satellites in groups they call 'flocks' into space. When I say tiny, the satellites measure around ten-by-ten-by-thirty centimetres—not much more than two volumes of the print version of this book put together.

11.2 EMBRACING FAILURE: TO BOLDLY GO

At the end of the last chapter, we explored Chandler's view of the turn to technology or 'hactivism', as in part based on the failure of traditional development approaches. Interestingly, Planet Labs came up with the idea for Dove satellites by embracing failure as a mechanism of experimental design.

Satellites are normally large and expensive to send into space. Developing and launching them is high-risk financially, as failure incurs a high cost. Planet Labs founders asked themselves—what if we sent up hundreds of tiny satellites? Then the failure of some would not affect the coverage of the network enabled by those that succeeded. The company model is therefore to launch dozens of simple satellites into low orbit, knowing that a percentage will fail, but that this failure will not cause the failure of the entire network.

This relatively 'low-tech' approach to satellites aims to 'disrupt' traditional satellite provision by providing an amended technology at a different scale of cost. Yet, so far, as with other PeaceTech companies, Planet Labs still struggles to make a profit, posting a 'break-even' position in 2025, although its growth continues (see Singh, 2025). Also of quirky note, some of the Dove satellites are adorned with Star Trek artwork, in a partnership with the Roddenberry Foundation (of Star Trek creator Gene Roddenberry).

11.3 'REMOTE-SENSING' ADVANCES

Images such as those da Vinci produced from the ground are now produced through a range of imaging techniques, including photographing from balloons or drones, as well as satellites. Aerial mapping can include topographical mapping or mapping of heat or light emissions.

Many remote-sensing technologies are available on the open market—for example, Google Earth (2025). Dove satellites indicate the ways in which satellite technology that was once hugely expensive and the preserve of militaries, governments, and big business is increasingly available to ordinary users (see further Card et al., 2015). Companies are also being created that make it easier to use satellite data. Strata, for example, who we met last chapter, has built its platform using the open-source Google Earth images. The Strata partnership includes a small, dynamic Edinburgh-based company called Earth Bloxs (2025), which provides a no-code way for educationalists and others to customise Google spatial technology and build it into their platforms. Incidentally, this is modularization in practice, as Earth Blox allows people to add satellite imagery to their practice as a module by reducing the level of expertise needed to ‘bolt it on’. Other similar companies exist such as Sarmap (2025), which supports processing of Earth imaging, and ATOM (European Space Imaging, 2025), which provides a platform for tasking, and project management, of satellite imaging jobs.

11.4 GEOGRAPHICAL INFORMATION SYSTEMS, GEOCODING, AND REMOTE-SENSING

Geographic Information Systems (GIS), geo-coding, and remote-sensing are the bundle of digital technologies that offer scaled transformation of both war and peace efforts. Satellites are only one form of ‘remote sensing’ (remember the fitness watch GPS?). The images they produce comprise geo-spatial data, which can be part of a ‘Geographic Information System’ or GIS (on terminology see further Farquhar, 2023).

A Geographical Information System is “a computer system that analyses and displays geographically referenced information. It uses data that is attached to a unique location” United States Geological Survey (2025).

Data to do with place can be recorded as geocoded points or areas, so that they can be located with reference to each other, for example, on a map. Geocoding involves assigning geographic coordinates to location

data and is not the same as mapping. A map is one way of visualising spatial data, albeit a common one. Geocoding can also comb data using AI. Google Maps (2025), for example, shows all addresses using both a map and a ‘street’ view obtained by photographing streets and locations. Its street view is produced not by satellite but by ‘Google street cars’, and sometimes walkers with backpacks that have special mobile cameras attached that take 360-degree images. AI then helps overlay the photographs on top of each other and blurs out car licence plate numbers and faces to create the street view image.

As our opening story about Leonardo da Vinci illustrated, the connection between war and geo-spatial data is strong both historically and today. Contemporary conflict event-data is all geo-coded. We have also already seen multiple uses of GIS in early-warning systems that often use maps to analyse where conflict is and point to conflict patterns. Is there a further capacity for GIS to support peace and transition processes beyond alerting to conflict-renewal?

11.5 SPACE, CONFLICT, AND PEACE

To understand the potential of GIS for peace, let us digress a bit. Conflict happens in real physical spaces. It seldom sprawls out evenly across countries and communities, but centres on areas that have people, important infrastructures, or important resources. The Turing Institute initiative described last chapter, for example, found a link between war and major roads. Like many forms of violence, wars map onto other social realities, meaning that armed violence tends to be worse in some spaces, for example, in borderland spaces between divided communities, poorer parts of countries or cities, or in areas in which minorities are present. These spaces of conflict reflect conditions of structural violence such as poverty and marginalization that also have a spatial dimension.

Researchers, including us, have argued that space requires more consideration in peace and conflict research. The various connections between conflict, peace, and space are useful for understanding the relevance of GIS to PeaceTech because they show how space matters (Björkdahl & Buckley-Zistel, 2022).

The spaces of actual conflict sit alongside a more conceptual, less ‘plot-table’ space. For example, towards the end of the conflict in Northern Ireland, I lived in North Belfast in an area that was majority Nationalist/Catholic and bounded on one side by a ‘peace wall’ that divided it from a

very similar neighbouring Protestant/Loyalist community. The road that our house sat on was one side of a half-mile triangle of three roads that had seen over twenty-five percent of all the killings during the conflict. Kids played on the streets and did not leave their area because of an invisible ‘sectarian geography’ that meant they felt at risk if they entered a Protestant neighbourhood just a block away. Anderson has evocatively called identity groupings ‘imagined communities’ because they involve communities of the mind, where differences between people are often created as much as real (Anderson, 1983). These imagined communities live and move through imagined spaces that create real-world physical constraints. Community members are acutely aware of safe and unsafe spaces and learn how to navigate both visible and invisible borders.

People are involved in ‘spatial practices’ that create, transform, or dissolve space with relation to peace and conflict. In Colombia, for example, communities have worked persistently across decades of conflict to create ‘zones of peace’. These zones are specific ‘territories in which local communities have attempted to persuade armed actors to abide by certain rules to mitigate the effects of the armed conflict locally.’ (Idler et al., 2015, p. 1). Throughout different phases of conflict, communities often try to create peaceful spaces in the middle of conflict, whether through community de-escalation attempts or by negotiating a border with surrounding armed groups.

Spatial dynamics make some spaces very significant. Peace processes and agreements often reconstitute what comprises ‘the nation state’, new international borders, new administrative districts, federal regions, or even ‘entities’ (Bosnia and Herzegovina provides a particularly complicated tapestry) with new interfaces and technologies. Conceptually, the disruption of peacebuilding discussed in Chapter 6, sees the global, the local, the national, and the transnational all blur; spatial signifiers such as North–South or centre-periphery become important nationally and regionally. Spaces such as cities, or capital cities, are often their own ‘space-apart’, and have divided spaces within. Capital cities are fiercely contested during conflict because owning them carries the prize of being seen to be the government with effective control (even where nationwide effective control has not been achieved).

Stopping armed conflict involves combining logistics with maps. Ceasefires, for example, are all about space. They involve lines of control,

buffer zones between armies, no-fly zones, and areas from which withdrawal must happen. In Syria and Yemen, as already noted, ‘micro-confliction’ local agreements attempt to create peace between communities, or to let humanitarian access through. These agreements can set up new ways of managing relationships in particular areas – checkpoints, airports, or borders.

11.6 GEO-CODING

11.6.1 *Conflict Data*

A space and peace research agenda is now beginning to emerge. GIS, geo-coding, and data visualization are all well developed as regards conflict events and enable new lines for this research with practical application. PeaceTech gives us improved capacity to understand the spatial realities of peace and conflict using geo-coded data, whether from population surveys, movements of people, satellite images, or sensors.

Conflict datasets are geo-coded and enable literal ‘mapping’ of conflict patterns. ACLED and UCDP conflict event data is all geo-located in ways that mean it can be connected across datasets—we explore how we have connected this to peace agreements in Chapter 12.

However, while conflict events such as killings take place in pinpointable locations, conflict as a system is perhaps better thought of in terms of ‘zones’. Mapping zones is more complicated than mapping points. In Ukraine, for example, multiple attempts have tried to ‘map’ in an ongoing way, zones of control as battlefronts advance and retract (see eg., Liveuamap Map (2025), for an example).

11.6.2 *Reporting*

Conflict and peace data also can involve geo-located news, X/Twitter, and other social media, or other forms of crowd-sourced reporting. Google has a source called GDELT (The GDELT Project, 2025) that geo-locates news stories—both the source of the story and the location reported on, with coding relating to conflict and peace events and sentiment (whether positive or negative) (see further, Gardner & Bell, 2022). Other forms of social media and crowdsourcing have techniques of geo-location, although there are also ways of evading it.

11.6.3 *Geo-coding Spatial Imagery*

Satellites and other remote sensors geo-code data and are important to conflict early warning mechanisms and ‘post-hoc accountability’ mechanisms, as we examined last chapter. With climate change comes concern to track its conflict-impacts, and satellite imagery can often map both, as Owen’s story at the start of this book and the example of Strata above illustrate.

However, satellites are not the only ways of capturing images from on high. Drones can also be involved, or even tethered balloons with arrays of cameras. We tend to think of drones as WarTech, but they can be attached to peacebuilding—modular-style. In 2017, for example, UNICEF launched an initial drone corridor for what it and UN Peacekeeping prefer to call ‘Unarmed Aerial Vehicles’, or UAVs, to distinguish what modularising for war turns the drone into. The corridor was to test the use of drones for humanitarian and developmental tasks, and in particular their ability to deliver vaccines in Malawi (UNICEF, 2017). These forms of surveillance now give peacekeeping forces a new form of ‘intelligence’ capacity. Drones, or UAVs, have been used by peacekeeping operations in Democratic Republic of Congo (DRC), Mali, and Central African Republic—all situations of hugely fragmented national conflict (UNICEF, Office of Innovation, 2025).

11.6.4 *Geo-coding Peace?*

Much less explored is how we might geo-code ‘peace’. This is something we have been experimenting with, in creating our Peace and Transition data. The geo-coding of COVID-19 ceasefires described in Chapter 9 was an attempt to geo-code peace.

We have also produced a map of our peace agreement data, indicating which countries have peace agreements (PA-X Analytics, 2025h). This map also shows regional patterns in their content. The map allows the user to explore the relationship between space and time—a concertina button enables the viewing of peace agreement geographical changes over time.

We have also ‘mapped’ peace at country level. For example, as regards Ukraine, we produced a ‘map of maps’ that layers different type of conflict event data so that trends can be compared and monitored over time. The map also includes data about location of, say, nuclear or other power

plants that seemed to be targeted by Russian attacks posing substantial risk of catastrophe.

On this map we also mapped types of dialogue or mediation (PA-X Analytics, 2025g). We collaborated again with the ETH Zürich to use data they had collected in the first few months of the war on attempts to negotiate ‘humanitarian corridors’. We represented the corridor mediations as arrows between beginning and end points on the map. We were not able to plot and represent the *actual* route of the corridor. The exercise also made us realise that it would also have been useful to collect more information about the ‘type of route’ involved in the corridor—whether a road, a railway route, or other.

Although conventional wisdom has been that no mediated peace process has been possible between Russia and Ukraine, the map visually illustrated just how much micro mediation is ongoing. The map provides a surprisingly ‘alternative’ story. This data informed new analytical research exploring whether ‘islands of peace’ might be a strategy for unwinding aspects of the conflict in an ongoing context in which immediate resolution seemed unlikely, and sought to understand the risks of this strategy (Wittke, 2023).

Other deals have a less easy way of pointing to the ‘to’ and the ‘from’, posing challenges for geolocation. For example, a grain deal in Ukraine focused on how the ten percent of the world’s grain that comes from Ukraine might get out through ports to the countries that depend on it (see further, Harland, 2023). What is the geolocation of this agreement? It is in a sense from Ukraine to the rest of the world. In practice, however, the grain had to transit through Ukraine’s neighbours. The deal soon was opposed by Poland and Hungary, as they found that the transit regime set up by the grain deal led to large amounts of grain arriving in their countries and staying there, to the detriment of their farmers. Their attempt to impose bans on grain then required further negotiations amongst EU countries, not least because their opposition threatened the EU consensus on support to Ukraine (Greenall, 2023).

In a move from ‘geo-location’, we are now attempting to engage in conceptual mapping of dialogues in Ukraine, Myanmar, Sudan, and others, using actor-network mapping. In all these places, ‘grand bargain’ negotiations with militaries seem both undesirable and impossible to achieve, but multiple forms of dialogue between different permutations of armed and civic actors exist. This initiative tries to work with the multi-mediation dynamic of double disruption by viewing conflict as a system

that needs to be unwound piece by piece. We can then visualize the ‘peace systems’ that address particular conflicts within the system.

Our peace agreement data also includes a collection of ‘local agreements’. These also pose challenges for map representation because the agreements do not exist in a ‘point’, but establish peace in an area. Our analytical research has identified three different types of area that different local agreements address and even create (Bell & Wise, [2022](#)):

- forms of ‘peace zone’, such as cities, towns or villages, where armed actors and civilians come to a local political settlement
- borderlands between communities
- ‘peace roads’ that enable security for those who are travelling through

How should these areas be represented on a map? Some of the edges of a peace zone or borderland may be conceptual as much as actual. Deciding on the relevant zone may require understanding of what the agreement was ‘about’ in ways that risk imposing an acontextual meaning. When does mapping create zones rather than just reflect them? As Thrift writes,

space formations such as borders, territories, battlefields, or buffer zones are produced by the practices of agents with particular agendas in mind. They are ‘the outcome of a series of highly problematic temporary settlements that divide and connect things up into different kinds of collectives which are slowly provided with the means which render them durable and sustainable’ ([2003](#), p. 95).

All mapping involves choices of this complicated sort, as even the attempt to represent a three-dimensional world on a two-dimensional page requires decisions as to how to represent. The choices have political import. For example, maps of the world have historically shown colonial countries as many times larger than the countries they colonised when they were much smaller. We have been working on solutions for geo-locating peace, researching the types of tools and standardised codes that can be used to map countries and administrative regions within them, and experimenting with how to create polygons to represent where local

agreements are in place (see Farquhar, 2023). However, which representation is ‘best’ will depend on what the end-user wants the map for. Ideally, choices over how to map would be locally elaborated.

Mapping challenges point to both the importance and the limitations of GIS and the need to adapt geo-plotted events to understand not just ‘points’, but zones and relationships and often also movement of ‘to’s and ‘from’s.

11.7 RISKS OF GIS

As Owen’s story at the start of this book illustrated, GIS poses distinctive risks when used to monitor conflict contexts. Many of these risks are related to the way aerial imaging can operate as a module that can be added not just to peacebuilding practices or similar, but to practices of war.

Space data needs its own specific ethical frameworks, because it poses distinctive challenges (for a good deliberative account of these challenges, see National Space Council Users’ Advisory Group Climate and Societal Benefits Subcommittee, 2023; see also XCEPT, 2022). First, satellites operate outside of domestic jurisdictions so what frameworks and regulations apply can be unclear. Satellites are the subject of a network of international treaties, notably The Outer Space Treaty (or more properly, the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, 1966). Regulation of image use tends to happen within particular countries but only if they have provided such regulation. There are also international frameworks that try to redress the balance between countries watching and countries being watched, such as the UN’s Remote Sensing Principles (UN General Assembly, 1986). However, regulatory and ethical gaps remain (Padole, 2024).

Second, space data is collected to look at phenomena at broad scale, for example forest fires, droughts, or population dispersal. This data involves fewer personal privacy risks, although with improved imaging these are growing. Its use to view at scale means that the ethical imperative is often to ‘see more’ to understand a context, while personal data ethics focuses on how to collect ‘only what you absolutely need’.

Third, remote-sensed data such as satellite images is very clearly dual use as it can support peacebuilding or war-making, because it provides population-specific data on a large-scale (see further Chapter 16). The

companies that provide images often are also engaged with intelligence services or support armies, not all of whom act within the bounds of international law. Geo-locating people, or ceasefire zones, can all be used for war.

Fourth, there are distinct challenges of interpretation. Satellite images are not always easy to read and require expert interpretation. Satellite companies involved in both war and peace projects increasingly use forms of AI to ‘reconstruct’ images of what is being shown. For example, that a particular ship is an oil tanker, and has the oil tank on the surface or within. This type of image reconstruction uses AI and deep learning to combine the satellite image with databanks of images to select the best fit and then presents that image as what is being viewed. However, it is important to understand that even the best interpretive methods still have a level of inaccuracy. Some provide accuracy of up to ninety percent. However, a ten-percent misclassification risk is considerable if one is planning to destroy a vessel identified as armed, or estimating the risk to surrounding civilians from bombing. Ethical frameworks using appropriate mechanisms for evaluating accuracy are still being researched and debated (see e.g., Paolanti et al., [2024](#)).

11.8 CONCLUSION

We began this Chapter with the story of da Vinci in 1502 and Dove Satellites over five centuries later. One is a story of WarTech, and one a story of PeaceTech. But which is which?

Today we still revere da Vinci as the epitome of the Renaissance—a period associated with a civilizing shift to art, culture, and knowledge. We see less of his drawings of complex killing machines than his medical art promoting life. Nor do we easily associate the renaissance with the invention of gun powder and new forms of war in which he was complicit. Some suggest that da Vinci perhaps worked for Borgia simply because he needed a job to support himself to produce art. They point out that the multiple drawings he did for weapons show uncharacteristic dysfunctions that mean that they would not have worked. They muse that given da Vinci’s skills, these errors were perhaps the deliberate sabotage of a secret pacifist.

As regards Dove, we discussed earlier Elon Musk’s SpaceX programme with its Starlink satellites that have the very birds-of-prey names such as ‘Falcon’ and ‘Kestrel’, and that provoked Planet Labs to name their

satellite ‘Dove’. In 2020 SpaceX entered a five-year partnership with Planet Labs to launch the miniature Dove Satellites into space (Bradshaw, 2020). The partnership brings climate change efficiencies as Dove launches can be undertaken as part of other launches. However, the partnership also points to possible misalignment between Dove’s environmental mission and SpaceX’s ambition of mounting commercial flights to space—something that has huge negative environmental impacts.

Relationships of philanthropy, business, war and peace, climate harm, and environmentalism increasingly entangle in ways that make it difficult to assess and predict their moral consequences.

Questions

1. What peace and conflict spaces can we map, and which can we not map?
2. What are the dangers of mapping?
3. Are you excited by the potential of satellite and other forms of aerial imagery for peace? If so, why? If not, why not?
4. What ethical and risk challenges most worry you? In what types of ways can these be mitigated?

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Peace Analytics

Abstract This chapter examines data analytics for supporting peace and transition processes. I term this ‘peace analytics’. To explain and illustrate how peace analytics work, I tell the praxis story of our development of the PA-X Peace and Transition Data. The story illustrates the key relevant data sources for peace analytics and the key ingredients for effective use. Developing peace analytics requires addressing matters such as ‘data-interoperability’. The chapter makes the case for peace analytics to support ‘adaptive’ peace processes, which helps support peacebuilding in the age of double disruption.

Keywords Adaptive peacebuilding · Peace analytics · Data interoperability · Dashboarding

12.1 SEARCHING FOR POLITICAL IMAGINATION

In Northern Ireland, during the conflict and as the peace process emerged, I worked, with others, to support human rights issues being addressed in the peace agreement. The conflict lasted thirty years—at that point, my whole life. As a ‘multi-hatter’, I was also involved in a ‘Women into Politics’ programme aimed at helping women in all political parties engage in the peace process, and to form a women’s party if they wanted (they did, and did!). This programme operated primarily in

women's centres in Belfast often located in areas that are predominantly in a Protestant or Catholic community. It then brought women together in mixed Belfast-wide discussions.

With the arrival of the peace process, we worked to understand how the process should and could improve human rights, equality, and inclusion and so address root causes of the violence. Many of the human rights issues had underpinned the conflict or become part of how it was waged. We argued for human rights reforms even in the midst of violent conflict, often to no avail. When the peace process arrived, we asked: what could and should we expect to change 'all at once' if there was a peace process? How could human rights issues be addressed in a mediation process that would assume a central focus on sovereignty issues? What form of drafting would capture human rights commitments in ways that could support effective implementation?

Instinctively I, and others, looked to see what people were doing in other peace processes. How had issues like police reform, removal of emergency law, or release of prisoners been addressed? When and how did human rights issues enter processes? What types of argument were persuasive? How had mediation design enabled those arguments to be made? When and how had women influenced a peace process? What had they asked for? How might the experience of women in other countries benefit women in Northern Ireland? What followed was a journey to pioneer what I term 'peace analytics'.

12.2 'PEACE ANALYTICS'

Peace Analytics is a third emergent area of ongoing digital innovation with capacity to produce impacts of scale across conflicts. It relies on digital innovation in the area of data analysis and statistical methods of computation, and more recently large language models and AI.

Data analytics: The science of using raw data and computational analysis for use of discovery, communication, and interpretation of patterns in the data to inform how real-world phenomena operate in practice.

Peace analytics. This use of data pertaining to peace-and-conflict-related issues, for use of discovery, communication, and interpretation of patterns in the data, so as to inform conflict resolution and peacebuilding practice.

Data. ‘Organised information’ whether quantitative (numeric), qualitative, pictorial, or text.

We have seen examples of peace analytics and relevant data already. For example, CEWS are data driven and increasingly integrate quantitative data with other forms of data. While CEWS focus on predicting and responding to conflict, peace analytics aim to support and resource peace and transition processes, although much of the data for both tasks is the same.

Peace analytics has capacity to plug already-mentioned CEWS gaps, such as mapping peace or dialogue or civiness. It can perhaps be used to predict the onset of peace. However, challenges remain. I point out these challenges and ways of overcoming them by continuing the praxis story of how the early search for comparative material as an activist developed.

12.3 EMERGENT PEACE ANALYTICS

As an activist and academic, in the final years of the conflict, excited by the end of conflicts elsewhere in the world, I began to orient my work to how conflict could be ended in Northern Ireland. With the help of the Harvard Negotiation Project, I mounted a new course on negotiation skills at Queens School of Law, which at that time was the main training ground for future politicians. I changed my research agenda. Northern Irish scholars and activists often looked to countries with historic or solidarity connections for comparison, such as the Israel-Palestine conflict, or apartheid South Africa, or to a lesser extent Sri Lanka (see Guelke, 2024). Yet, I wondered if these were the best comparators. I looked for other peace processes with peace agreements. To my surprise I found a lot more than I expected, many of which I was only vaguely aware.

I started to collect peace agreements—increasingly obsessively! I worked to understand the conflicts and peace processes they produced. These days were—amazingly—before the internet was fully part of our lives. I often wrote to both armed groups and governments to get

texts of their agreements. I was surprised that they sent them in quick response. Many were quite proud of the agreements they had negotiated. Other times I had visited the country to assist in mediation or met someone from it, and was able to get hold of texts that were only available in-country. In yet other contexts, pioneering individuals had made compilations of documents that were only available in local bookshops.

As the internet took off, some agreements appeared on the web only to disappear because governments changed, or organizations decided not to keep an archive. I learnt to download agreements as soon as they appeared and worked to verify content. Some countries over time developed detailed web resources. The Israeli Ministry of Foreign Affairs, for example, put up all the Oslo Accords between Israel and the Palestinian Liberation Organization (PLO), and they are still accessible even if less easily than at the time (Government of Israel, 2025).

I began to develop a definition and list of peace agreements. I tried to stay neutral as to how long the agreement had lasted or the form the agreement took—as a ‘treaty’ or a signed text, or an interim constitution, or UN Security Council Resolution (all modalities of documenting agreement) provided there was evidence of formal party agreement (Bell, 2006). I also collected agreements regardless of whether they were successful or failed. My first ‘census’ was published in 2000 as an appendix to my first book ‘Peace Agreements and Human Rights’ (Bell, 2000).

12.4 PA-X PEACE AGREEMENT DATABASE

Over time, this collection transformed into the PA-X Analytics: Peace and Transition Process Data (2025a). PA-X provides a census, or complete collection, of all peace and transition agreements from 1990, when the Cold War ended and the contemporary peace mediation practice largely began, to the current day. It comprises over 2000 agreements found in 150 peace processes involving over 1500 signatories. A much different, more expansive resource than that I initially contemplated and embarked on (see Bell & Badanjak, 2019).

PA-X includes agreements at all stages of a peace process classified into:

- ceasefire agreements
- pre-negotiation agreements that involve ‘talks about talks’—who is going to come to the table, with what status, what agenda, and what pre-conditions met
- partial framework agreements, which address multiple issues but do not purport to be a final agreement
- comprehensive agreements, which purport to offer the main promises necessary to end the conflict
- implementation agreements, reworking agreements to include new actors or address new issues

Each agreement is searchable by name, country and entity, region, peace process, and stage. Each agreement is classified into over 250 searchable topics with extracts of the text, covering all the critical issues in peace negotiations. These are set out in a fully elaborated codebook and manual, and data exists also as a machine-searchable corpus of texts (which enables machine learning—more on that later). Search results can be exported as PDF or CSV files of the topics included in a spreadsheet, or a timeline. PA-X enables both quantitative and qualitative research on peace process design, issues, and actors. The peace agreement data now forms part of a wider suite of peace and transition process data tools.

12.5 PEACE PROCESS DATA

PA-X is not, however, just a database of agreements. It is fundamentally data that is designed to enable comparison of peace and transition processes. I wanted to compare agreements because I was interested in peace process design and evolution: what was agreed at different stages of a peace process, which actors were present, what issues were addressed as critical, and how did drafting capture commitments? As I collected agreements, I became aware of fundamental questions as to whether agreement comparisons were comparing ‘like with like’. The ‘National Peace Accord’ in South Africa (1991), for example, sounded very similar to a comprehensive agreement, but in fact was a partial agreement that paved the way for the later Interim Constitution, which operated in-effect as the peace agreement between the apartheid government and the ANC, and indeed

other groups (South Africa, 1993). The need to compare agreements by understanding their role in a process prompted the creation of the stage classification system set out above, and in so doing revealed how different mediation processes unfolded, as coding informed process design theory. Process data is an unusual form of data. Most other data in the field is ‘event’ data, such as an armed event, a killing, or an agreement’s signing (which PA-X also operates as).

When we collected the whole spectrum of agreements, we found many more agreements than people tend to remember. Processes moved forward and backwards, with new agreements re-shaping what had come before. As we visualized our data in process form, we began to see and communicate the long-term nature of peace processes as incremental and iterative, rather than focused on a comprehensive peace agreement. You can explore our ‘messy’ peace process interactive visualization (PA-X Analytics, 2025f) to see what the forwards and backwards movement of peace processes looks like (for an account of the process of production see, Bell et al., 2022). The research and visualization, illustrating messy processes, I suggest, changed the mediation field. It helped researchers and practitioners approach negotiations not as leading to a final agreement, but as ongoing complex processes of change over time (see e.g., Paffenholz, 2021).

These global peace mediation trajectories mirrored what I was experiencing in Northern Ireland. The Agreement signed in 1998 included significant human rights and equality provisions that we had argued for. While we had seen the Agreement as an endpoint in the conflict, we were soon taken aback by how difficult it was to get parties to implement their promises. It was interesting to see across peace processes how an agreement is often the beginning of the peace process ‘proper’, rather than its end.

PA-X was born from two other motivations. I wanted to create a ‘census’ of peace agreement practice not only to trace processes over time, but to be able to produce descriptive statistics of who negotiated what issue at what stage of a process. I was also driven by trying to preserve an archive. I had found these documents so useful, and difficult to collect and parse through, so it seemed good for others to benefit from my work. Plus, the archivist in me cared about the documents surviving as artefacts. The documents, often with initials scrawled on every page, or with hand-written addendums, are visually interesting and important.

12.6 FROM PA-X TO PEACE ANALYTICS

Over time, PA-X data has extended. We have created or incorporated other ‘interoperable’ datasets beyond peace agreements to build a more detailed and broader picture of peace processes and their relationship to conflict. Interoperability means that data from different datasets can be used together in ways that make sense. PA-X includes PA-X Gender, which includes a ‘deep dive’ into gender provisions in peace agreements (PA-X Analytics, 2025d). This is the dataset that underpins the PeaceFem app described earlier in Chapter 9. We also created PA-X Local (PA-X Analytics, 2025e), comprising agreements that deal with small geographic areas in broader armed conflicts, such as that which Atem was working on in Chapter 1. This unique collection of very localized peace agreements documents processes between rural communities, or among the key actors in cities. While our local data is not a ‘census’, as many more local agreements exist than can be found or collected, it does provide interesting data of how ‘fragmented peace’ is produced in contexts of fragmented conflict, where local conflict can often spark national conflict and agreements are needed to de-escalate conflict at early stages, or to ‘mop it up’ in the aftermath of a national peace agreement (see Bell & Wise, 2022).

The PA-X suite includes an Amnesties, Conflict, and Peace Agreement (PA-X Analytics, 2025b) dataset, developed by Professor Louise Mallinder of Queen’s University of Belfast, as part of our research collaborations. This is another ‘process’ dataset, as amnesties are not events but unfold gradually through iterative agreements and often legislation. By working to combine PA-X amnesty data with Louise’s earlier collection of amnesties, we had robust data that was interoperable with peace agreement data.

Amnesty data is important because amnesties remain controversial in peace mediation and often pose a stumbling block to agreement. Amnesty is often the price of reaching peace between armed actors. However, while armed actors will often have a mutual self-interest to ‘forgive and forget’, agreeing to do so sells out victims and ‘accountability’ in ways that come to undermine peace agreement implementation down the line. The amnesty data helps to move beyond assertions that amnesties are either all good or all bad, by illustrating the many options for their design and evolution over time. In so doing, it illustrates innovative ways to square the amnesty-accountability circle.

12.7 PEACE ANALYTICS FOR DOUBLE DISRUPTION

We are now producing additional data, to help support mediation responses to double disruption.

12.7.1 *PA-X Tracker: Measuring Success and Failure*

To address changing conflict and peace dynamics after a ceasefire or peace agreement, we developed a Peace and Transition Process Tracker (PA-X Analytics, 2025g) to support innovation in monitoring how peace processes are implemented through agile forms of adaptive management, as touched on earlier. The Tracker brings together carefully curated data relating to conflict and peace, and our own suite of peace and transition process data, including the new datasets below.

Most conflict arises in contexts that already have had conflict (Collier et al., 2003). Peace agreement implementation is an important strategy of prevention. Our next step was therefore to set up analytics to measure implementation. As Richard Caplan points out, peace has no settled content, so we cannot easily measure whether it has been achieved (2021). Instead, he suggests, we have to define ‘peace impacts’ that can be measured. Peace impacts can include reduction in armed violence, but also measurements of democracy or economic measures (see box).

There are, however, data gaps. Relevant data does not always exist for all conflict countries, is not always reliable across case studies, or does not cover a long enough time period to capture peace agreement implementation longitudinally. Data-matching is needed and remains difficult. Nevertheless, an expanding array of data for measuring peace impacts exists (see box below).

Composite data sets relevant to peace (that crunch many of the datasets below). For example, the Global Peace Index (Vision of Humanity, 2025).

‘Institutional peace-related event’ datasets. That is, datasets dealing with particular political institutions, for example, NELDA Elections dataset (Hyde & Marinov, 2025), and COLPUS Varieties of Coup D’Etat (Chin et al., 2021, 2025).

Political indicators. For example, V-DEM Varieties of Democracy Dataset (V-Dem [2025](#)).

Conflict and Security Indicators. For example, ACLED, UCDP ([2025a](#)), and Correlates of War, and SIPRI databases (SIPRI, [2025](#)) on issues like military expenditure.

Economic Indicators. For example, The Government Revenue Dataset (International Centre for Tax & Development, [2025](#)), and the Global Food Prices Dataset (World Food Programme, [2025](#)).

In addition to this, there are qualitative measurements of ‘success’, which can be given quantitative value. For example, the PAM Peace Agreement Matrix approaches peace agreement implementation success in terms of ‘were the promises made in the peace agreement met?’ It follows political events for a 10 year period after the Agreement was signed, to see if commitments were honoured, using news sources (Peace Accords Matrix, [2025a](#); Joshi & Darby, [2012](#)). PAM assigns numeric values to how well the commitment was honoured, which allow for some quantitative assessment.

AI generally, and generative AI in particular, as well as data such as GDELT now offer new tools for undertaking this type of enterprise, which was until now done more manually (see Gardner & Bell, [2022](#)). The new disruption of peacebuilding efforts, and the unravelling of the global order that supported them, pushed us to consider where peace analytics could go.

We designed a Peace Process Tracker that builds a better picture of how actors assemble and disassemble for peace or for war, often with uneven impacts across measures. We suggest that this approach better supports adaptive peacebuilding and the ongoing construction of the ‘multi-level’ peace processes that need to be constructed to address multi-level conflict systems. We want to do this in ways that are sustainable over time.

To understand how data support for adaptive management might work, consider the tube station in the London Underground, where an automated announcement repeats ‘mind the gap’ to warn of a dangerous gap between the train floor and the platform. COVID dashboards illustrated the usefulness of minding gaps between areas with COVID infections and where hospital beds, quantities of PVC masks, and gloves, etc., were located.

Our project similarly uses data analytics to suggest where to ‘mind the gap’ between peace agreement commitments and implementation. This could be the gap between promises made and actions unfolding, between national and local perceptions of peace, or between negative and positive concepts of peace. We are able to highlight outcomes achieved and where gaps are opening that perhaps need peacebuilding projects, including those that new forms of mediation could bridge.

However, there are considerable issues that have had to be wrangled to take peace analytics in this direction. They include:

- Agreeing and defining what peace or ‘peace impacts’ are
- Finding appropriate data that is reliable and consistent in conflict settings, which might measure them
- Finding ways to bring different types of data together intelligently
- Localizing data through new localized data collection, or finding ways to disaggregate it by area
- Connecting data findings to analysis

Our Tracker in a sense acknowledges that there is no settled meaning of peace—it is something that is constructed through the very debates as to how it should be measured (remember Ken Bush and his knife?). We therefore have created a Tracker with ‘different ways of seeing’ progress, across very different types of knowing and data. It is useful in the questions it prompts—for example, as to why ‘good things are not going together’—as much as in the answers it gives. The interface has the following components, in this initial iteration at least.

A country timeline of formal institutional change. The timeline builds on earlier ‘process-oriented’ data interoperability we set up to bring together automated timelines of peace agreements across all stages of the process, constitutions, elections, amnesties, and coups. This event data updates automatically. The timeline enables comprehensive political process tracking over time.

Peace agreement topic analysis linked to quantitative implementation data. A dashboard links agreements to a range of peace impact indicators. We think the need in the field is not more data, but less data. Knowledge of interoperability and data limitations should constrain what data is chosen. We therefore only include customized bundles of data that have time periods and geographies that cover conflicts, and that we, and

others in the field, trust and already use, such as those listed above, and notably deaths in conflict data across datasets. In countries where we have local researcher field teams, we add localized perception data.

Peace agreement qualitative implementation data. We have developed a natural language processing (NLP) methodology based on semantic similarity (see Gardiner, 2023), to connect agreement text to where implementation of its key commitments are monitored in reports. As regards particular peace agreement commitments, we are now able to extract implementation data of a narrative type. For this, we need accurate implementation reports, which for some countries exist and for others do not; for the latter, we will have to source good quality consistent narrative information. The NLP tool is reusable for other tasks, such as comparing how topics are treated in different drafts of agreements, or topic modelling consultation responses in an automated way, and comparing peace agreements and the constitutions that follow.

Actor Networks. These show who has signed agreements and what third parties were involved and connect this data to group dynamics within country (see further below). We have extended our visualization practice to ‘mapping peace dialogues’ and examine ‘islands of agreement’ and trace the connections between them.

The PA-X Tracker does not aim for a static overall ‘measurement’ of peace. It paints a picture of what is going well, what is going poorly, and where indicators sit together ‘oddly’. The intention is to support deliberation by actors in the field as to: is this real or an artefact of data collection efforts; why might the picture be mixed; what does it mean; and how should it be addressed?

12.7.2 *MEND Mediation Data*

The above data is also now supplemented by two further datasets, also focused on providing negotiation intelligence in an age of double disruption. The first is a new Mediation Events and Negotiators Database (Peter et al., 2025). MEND tracks some of the world’s most violent conflicts and logs all mediation and mediation-related events involving external third-party actors, regardless of whether these events result in a formal peace agreement. It captures mediation occurring in formal peace initiatives and mediation efforts running in support or in parallel to these. Each record corresponds to a unique event, providing detailed metadata about location, third parties, local actors, and individuals involved.

12.7.3 *Peace Agreement Actor Data*

We have also used ‘Named Entity Recognition’ (Henry, 2024), to produce a new Peace Agreement Actor Dataset (Badanjak & Henry, 2025). This data systematically denotes the entities that sign peace agreements as parties or third parties, with associated metadata such as actor type and country in which they are based. It comprises 8211 signatory instances by 1310 unique actors, across 1689 peace agreements.

This data enables us to link agreements to specific actors in UCDP or ACLED based on who signed them, rather than by country or conflict level alone. Additionally, the dataset can provide insights into third parties that have signed and mediated agreements and allows us to examine topics likely to appear when certain third parties are involved.

12.8 DATA INTEROPERABILITY

We have also worked to create interoperability between our dataset and other datasets with which we either have partnered or have worked collaboratively in PeaceRep to develop. This work helps build new data capacities, and also a wider culture of data interoperability in the field over time. Connected data includes Constitute (2025), a database of the world’s constitutions and a new International IDEA Database in Constitution-Building Processes in Conflict-Affected States (International IDEA, 2025). We have combined structural data on peace processes with our own detailed perceptions surveys carried out in the field by local researchers in South Sudan, Syria, and more recently Ukraine.

Emergent peace analytics, as illustrated by PA-X, has its research and development driven by praxis connections as outlined in our earlier stories of ceasefire and gender data. Our efforts are part of a broader picture of peace analytics that includes UN Peacemaker, designed for mediators (UN Peacemaker, 2025a), and UCDP peace agreement data (UCDP, 2025b), relating to peace agreements tied to UCDP conflict-and-armed-actor data, a collection that by 2021 had reached 375 agreements (Davies et al., 2022). The already-mentioned Kroc Institute for International Peace Studies, Peace Accords Matrix at the University of Notre Dame focuses on the implementation of thirty-four ‘comprehensive agreements’ over a ten-year period, with new data on partial agreements. ETH Zürich has recently released a ceasefire dataset of lateral, verbal, written, and non-implemented ceasefires from 1989 to 2021 (ETH CSS, 2025a, 2025b).

Collectively this work has built a foundation for data analytics in the peacebuilding field—or ‘peace analytics’, as we term it. The following are the lessons we learned as to the infrastructure needed for peace analytics.

12.9 CHALLENGES OF DATA DEVELOPMENT

12.9.1 *Software Choices*

A key obstacle to developing a new dataset is finding the right software to use to produce it. The software is vital to how simple or hard the ‘back end’ of data input will be, and how user-friendly the front end will be. My earlier attempts at a database had been frustrated by using ready-made database programmes that tend to be the software installed on university computers, which did not quite ‘fit’ what we were trying to design. They soon became difficult for people working with them to use because ‘workarounds’ to make them fit required training on systems that were not intuitive. I soon wanted to customize the data in ways that existing software does not easily allow. My collection had massively grown to well over 1,000 documents, and it was clear that direct topic-based access to the language of texts was very useful. As time progressed, it felt much simpler to design a dedicated interface for topic-classifying agreement content that staff could more easily use and that would offer capacity to alter data structures or change one’s mind over what topics to classify.

12.9.2 *Staffing and Environment*

A first breakthrough was finding the right team in University of Edinburgh’s Information Services, to deliver a specially designed database with dedicated back-end and front-end interfaces.

My team expanded to include a political scientist who was highly expert in quantitative analysis, Dr Sanja Badanjak. This was transformative for the nature, ambition, scale, and professionalism of the project. Sanja brought her own vision of what the database could be, came with a strong understanding of conflict data (and its constraints), and introduced me to terms such as ‘data interoperability’. She created, for example, a system for using country codes that link the data to nearly all the relevant conflict data (and wider). This was achieved by building in ISO country codes as standardized codes (2025), and then supplementing that with the Gleditsch and Ward List of Independent States, which

can account for things that ISO, being an official account of countries, cannot, including, for example, countries that no longer exist (Gleditsch, 2025; Gleditsch and Ward, 1999). This development gave us interoperability with three datasets providing information on conflict deaths and other events: UCDP, ACLED, and Correlates of War (2025), which deals with low-level conflicts, civil wars, and interstate wars. As noted earlier, these all have different thresholds of deaths and different methodologies for counting, which again need to be understood before using them. But bringing them together enables their trends to be compared in ways that points to whether a trend is real or an artefact of the data.

An amazing team of researchers also came on board, who engaged in and co-developed how we defined and documented topics. The staff team developed topic definitions collaboratively, all suggesting modifications that would evolve a form of ‘good practice’. At each point we would often need to modify our ‘back end’ and ‘front end’ interfaces for coding and enabling searching of data. This process also added quantitative innovations such as ‘weighting’ provisions depending on whether they were purely rhetorical or made a clear commitment to change, adding to the data analysis that could be undertaken.

As our work developed, we had to add skills and components: employing data engineers and visualizers. We have had to think how to architect and engineer our data into a more sustainable computing environment. We have also tried to think about how we make what we have learned open source and reusable by creating curated Peace Analytics resources.

The work has also involved constant re-training and mutual learning-support, as we grapple with ‘large-scale computing’, datamarts, or CKAN (2025)—platforms that coordinate different types of data in one database to curate data and data pipelines for how that will feed through to visualizations and similar, and different ways in which databases can be created and maintained. It has also involved thinking through complex ethics, data protection, and security issues.

12.10 END-USERS OF PEACE ANALYTICS

We have always designed our peace process data with five main communities of end-users in mind, and all are active users of PA-X. We work in collaboration with these end-users in multiple ways, and many of the

ideas of how to develop the data come from their articulation of needs and concerns.

Armed actors in conflict. These include both state security forces and non-state armed combatants, who seek to move to peace and want to know what a process looks like. Non-state combatants often come from a position of little to no expertise on peace process design because they are considering ending it for the first time. Providing a resource that armed actors can use is controversial. But if conflicts are not to continue forever, then they need to be brought to an end, and getting armed actors to agree to end the conflict is very often the least costly way of doing this in both moral terms, and in terms of the cost to human life.

International organizations and mediators who are involved in negotiating conflicts. The idea of PA-X was that it would provide ‘Peace Agreement Access’ for mediators, so they could draw on topic-based resources that they were encountering in negotiations, and also look easily at regional or comparative examples.

Organizations focused on ‘inclusion’ in peace processes, in particular the inclusion of women. These can often be international non-governmental organizations—human rights groups or peacebuilding organizations, who seek to ensure that people additional to those doing the fighting get a chance to shape the peace agreement and the country’s future.

Civil society actors in country. These actors often seek to understand how they might shape the peace agreement, or work to secure its effective implementation, and how they can shape demands into draft propositions for an agreement.

Researchers. PA-X now supports most of the quantitative research on peace processes, as it provides a transparent and reliable basis of counting and quantifying peace agreement commitments over the duration of a peace process. This means that the research it supports now goes well beyond our own team. PA-X has enabled a new research capacity.

12.11 WHAT DOES ‘PEACE ANALYTICS’ HELP US TO DO?

What use is this type of data—what type of support to peace processes does it enable, particularly in a context where conflict and mediation patterns are shifting?

Evidence-based innovation in peace process design and drafting. Our data is used frequently by mediators—of all different types—to understand how different issues in peace agreements are drafted, what is possible at what stage in a process, and what is at stake in the drafting. We have a set of ‘Peace Agreements and...’ publications that in part originated in response to mediator requests to understand how particular issues were dealt with in other contexts (see e.g., PeaceRep, 2025c). Local peace mediators, and representatives of some of the protagonists of the conflict, also use the database and call us up from the field. The database is not a set of drafts for cut-and-paste; it is more a precedent-finding tool for sparking political imagination in new conflict contexts.

Development and monitoring of new norms addressing peace process inclusion. As noted earlier, the UN Security Council and international courts have increasingly produced new norms or ‘laws’ as to how peace agreements should deal with certain things, such as UN Security Council Resolution 1325 of 2000 providing that women should be included in peace negotiations, and that peace agreements should reflect gender concerns. Early PA-X Gender data helped provide the evidence base that issues relating to women were seldom included in peace agreements, and since that time the data has been used by the UNSG to monitor implementation in annual reports. Findings that women are rarely present in pre-negotiation talks, or at implementation talks where commitments to gender are sometimes renegotiated (see Bell & McNicholl, 2019), influenced UN Secretary General recommendations that new efforts to include women focus on at *all stages* of a peace process. Subsequent UN Security Council Resolutions have recommended that efforts for inclusion take place at early and late stages of peace processes (see e.g., UN SC Resolutions 2242 (2015), and 2493 (2018)). Updated data on where women figure in peace processes and how well any peace agreements address gender issues continues to feature in the Annual Security Council updates. The PA-X Gender data (PA-X Analytics, 2025d) and our efforts to create a Peace and Transition Process Tracker have also led to PA-X eco-system building support, with team member Laura Wise supporting UN Women to explore its own women-in-peace-process tracker.

Supporting mediators, civil society, donors, and international organizations to understand that peace processes are dynamic and

iterative and need long-term mediation support, rather than a once-off burst. Our messy peace process visualization, and the data that underlies it, has helped create a broader vista amongst international mediators, donor states, and international organizations of how peace processes unfold. It illustrates multiple iterations of peace through multiple agreements. This is important knowledge for people who often arrive in-field on short notice. The data illustrates that a comprehensive agreement has had a ‘before’ and will have to have an ‘after’—even if international actors are no longer present. Seeing things from a longer time perspective changes the ways in which people approach negotiation in the moment.

Understanding new dynamics and trends in conflict and peace, and supporting those involved in peace processes to adapt. More recently, our work has provided an evidence base for understanding changes in peace process patterns, including who mediates, which has helped paint a picture of what in Chapter 6 I called the double disruption of peace processes that has come from shifting conflict patterns. These changes are now of central concern to a range of actors, and are underpinned by the clear evidentiary basis of our data that resonates with the experience of those in the field. The data illustrates, quantitatively, things that I described in that Chapter, such as:

- comprehensive agreements are on the wane, and the UN has been less involved in mediation over time
- interim transitional arrangements that contemplate social processes of reform are a prevailing modality for ending conflict, but go wrong in different contexts for similar sorts of reasons
- we are now in an era of geopolitical competition over ‘who mediates’ in peace processes, which is part of a struggle to shape global order to move away from international law norms
- many countries experience ‘iterative transitions’ against a background of fragmented conflict that is simply not amenable to a ‘big elite deal’ that once characterized peace processes

This information has been critical to how mediators and international organizations view and respond to contemporary conflict resolution challenges. It has also radically re-shaped our research agenda. It is worth pointing out that similar peace analytics efforts have made similar types of contribution in different ways, related to their design. One of the

most interesting is perhaps that of the Peace Accords Matrix, which was written into the Colombian peace agreement as a methodology that could be employed to monitor and support the peace agreement's implementation. The monitoring of whether agreement promises were kept has been vital to the implementation process and is now being used in other implementation contexts (see PAM, [2025b](#), [2025c](#)).

12.12 CONCLUSION

Peace Analytics adds value to those involved in peace process support. Like Monet's Cathedral At Rouen series of paintings, or the wonderful Atlas of Economic Complexity (Growth Lab, [2025](#)) that has served as inspiration for our data, the Peace and Transition Process Tracker is designed to show things from multiple perspectives, all of which give a slightly different view. Our peace analytics support ongoing peace process design and implementation in an era of peacebuilding disruption that includes falling funds for mediation support. It provides different ways of understanding and evaluating 'progress' in peace process outcomes. It also enables a form of 'negotiation intelligence' around past negotiating positions of conflict actors, international mediators, and innovative ways of mapping the complex mediation clusters that are operating in any one conflict at any one time. In doing so, our platform aims to support mediation practices in the new post-peace-process world and provides a working example of how peace and conflict data can be made interoperable.

Questions

1. What types of data do you think are useful to peacebuilders?
2. When and how is 'evidence' from other peace processes useful to knowing 'what to do next'?
3. What would make peace and conflict data more usable to a wider range of people?
4. What more data, and of what type, could be helpful?
5. How do you see Gen-AI shaping what is possible?

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AI for Peace

Abstract Artificial intelligence (AI) involves computer programmes that mimic human intelligence. It includes ordinary or traditional AI, and forms of generative AI (Gen-AI). This chapter considers the use of AI in ending wars in particular by supporting ‘listening at scale and documentation management in peace processes, providing for translation, supporting deliberation and political persuasion, and providing ‘negotiation intelligence’ as to who is mediating to what end. In the next chapter we consider whether AI hype is justified and examine the opportunities and challenges AI presents in the peacebuilding field.

Keywords Artificial Intelligence (AI) · Traditional AI · Generative AI (Gen-AI) · Artificial General Intelligence (AGI) · Peace analytics

13.1 AI FICTIONAL STORIES

In the last two years, AI has come to the fore of public consciousness and discussion, partly due to the arrival of generative AI (Gen-AI). AI has already featured, though somewhat hidden, throughout the book, particularly in Chapter 10 on Conflict Early Warning Systems and Chapter 11 on Space and Peace. Here AI was the almost invisible thread that stitched different sorts of data together to create actionable insight, for example, by matching images from space to images on the ground, by

computing conflict risks based on complex mathematical analysis of how past dynamics had played out, or by integrating large-scale social media data into CEWS. In many PeaceTech applications both traditional and generative AI are used, often together. This chapter will therefore talk generally about AI but try to point out when Gen-AI alone is being discussed.

To explore AI's impact, let's imagine Seán, Conall, Atem, Warren, Aker, and Owen from Chapter 1, a few years down the road from where we first found them. It should be stressed that the futuristic stories are entirely fictional and bear no relationship to any actual stories inside or outside of this book.

13.1.1 *Seán*

Seán's job supporting local peacebuilding has totally transformed. So much so, that he sometimes wonders if it is at risk, particularly given the wider cuts in funds to the United Nations. He routinely uses Gen-AI tools such as Claude (2025), ChatGPT (2025), and Co-Pilot (2025) in many of his tasks. He finds AI-generated summaries and synthesis of multiple reports very useful, even though he needs to then edit them considerably. He has also found the occasional instance of 'hallucination'—that is, where his AI chatbot makes up things that didn't happen. However, Seán is rapidly improving the way he phrases questions or 'prompts' the AI, and this has improved responses. He doesn't tell his boss what he is doing, and so always remembers to change the AI style to his own as part of the editing process.

Sometimes out of curiosity, Seán asks the chatbot to give him an assessment of a project's success to compare with his own evaluation. He does not trust the AI evaluations but finds that if he asks the AI to 'justify its answers', the evaluation gives him useful food for thought. He has also experimented with tools like Google NotebookLM (2025), which constrain the Gen-AI answers to information contained in documents uploaded by the user. These tools reduce hallucinations and enable him to check answers against source documents.

Reading local partner reports, Seán suspects that some of his project partners are also using AI to help write reports. The reports are all well organized in terms of the criteria the partners must address but often contain rather bland platitudes that could apply anywhere. Seán is curious as to where Gen-AI use could lead. Could his AI end up reviewing and

marking projects that the partner's AI has written up? How does AI affect his relationship with his local partners? Could an AI-driven process of reports talking to each other gradually remove all of them from any 'ground-reality'? What happens when the data he is compiling 'runs out' because no one is creating it anymore because they turn to AI to generate information? What will happen when no one has funds or incentives to create the new data that the AI relies on for 'training'?

Despite these doubts Seán remains excited by Gen-AI potential. Since everyone is using Gen-AI, he wonders if more creative processes are possible that would use Gen-AI to add value to relationships and knowledge, rather than subtract? Could Gen-AI help reinvent what project evaluation could look like? Or could he persuade his bosses to endorse AI for timesaving, making more time available for visiting projects in the field?

Seán feels another deeper unease about AI, which he shoves to the back of his mind. He is aware that Gen-AI uses masses of energy and water. Three of his local peacebuilding projects are focused on how to mitigate the impact of climate change on local conflicts, because desertification is causing displacement that can cause new inter-group tensions. The country is simply getting hotter and hotter. He wonders about the ethics of using AI in this context—how different is it from flying or driving, and why is it so hard to get a sense of his own carbon footprint from his Gen-AI searches?

13.1.2 *Conall*

The food aid organization for which Conall works has embraced AI big-time and now leads the field. It has invested a lot of money setting up an interactive platform to monitor the peace-and-conflict impacts of its food-aid decisions. The platform isn't perfect and has cost a lot of money. The system ingests all the organization's data and information and recommends which type of food aid might have a positive peace impact on a local area. His team examines the AI recommendations before implementing them. While the team often disagrees with the AI recommendations, considering them provokes useful conversations over what data the team trusts, how the AI model works, what is an artefact of data creation, and what might be real new insight. While the team seldom simply adopts AI recommendations, the AI-provoked deliberation often

leads to improvements in how they use AI, how they collect data, and how they deliver food aid.

Conall is aware that his organization's AI platform depends on being fed lots of data. His team has been the central point of liaison with the AI platform provider. The AI company promised an almost magical transformation in decision making, and that any data on armed group dynamics with relation to food aid would be firewalled from any other AI usage.

Yet Conall has some concerns. First, the AI company does not understand his organization's core business or operating context, and in turn his organization does not understand the company's 'AI Black Box'. Meaningful engagement with the company as to how to improve the platform is therefore difficult. Second, his organization seems to think that at some point the AI insights could be linked with more automated decision making of where and how food is delivered, bypassing his team's AI-prompted deliberation. Third, the AI-company also has a more lucrative contract with the state's authoritarian government and provides a service flagging and targeting suspected members of armed groups and even civilians that oppose it. Despite assurances that there are firewalls between organizations and projects, there is no way of monitoring or testing whether they are in place. Conall often thinks the temptation to blend data across projects must be huge.

13.1.3 *Atem*

Atem's app has recently won a PeaceTech prize as a 'next-generation' local monitoring tool. It no longer relies just on crowdsourced WhatsApp warnings to prevent armed group kidnappings of young people, but also integrates data relating to violence levels in neighbouring areas, monitoring of social media posts, and climate monitoring that indicates when an issue like drought might put pressure on local resources in ways that might motivate kidnappers to strike. Atem now works with a young start-up AI company full of people his age. They have produced the AI model that propels the app. The team is amazingly dynamic and fun to work with, but they can't quite explain to Atem in non-technical language how the AI balances the data to make predictions. They do explain that they have developed predictions by using past data to design an AI model. They claim their model was refined until it gave over eighty percent correct predictions when tested against past incidences, but Atem often

wonders if that really means his app's predictions are now eighty percent accurate, and whether eighty percent is 'good enough'.

Atem has been persuaded to deploy the new-look AI-driven app. He has been issuing warnings when the AI system triggers an alert. However, he takes extra special care to communicate warnings of imminent risk that come from human input, as he trusts human intelligence the most and it is often much more specific as to what risk is imminent. He is worried that his new app is perhaps producing 'false positives' and he is therefore 'over-warning' and heightening fear and tension in his community rather than decreasing it. He thinks about designing some sort of human-centred process to involve the community better in decisions about whether and how they want warned. He hopes the app company will meet with the community to assist him in understanding what it means to 'calibrate threat of kidnap'. These dangers of over-warning are an ethical and process-design concern that he had not thought of at the start. He worries his peace-focused funders will not want to fund this additional work or may see it as a red flag that the app is inaccurate and pull funding altogether.

13.1.4 *Aker*

Aker's work to address sexual violence has also changed. She has been appointed by the country's government as a commissioner on a national dialogue process and is now heavily involved in its country-wide consultations on what reform might help end the conflict. She continues to support the organization she founded that works with women victims of sexual violence in conflict. She has also retrained with a 'women-in-AI' outreach programme, acquiring digital skills, and is quietly working to promote good use of technology across the organizations she 'multi-hats' in.

On the National Dialogue Commission, Aker is trying to source Gen-AI software that would take tens of thousands of pages of documents, some handwritten, to extract themes and concerns that might help the National Dialogue create agendas for deep-dive consultations across the country. She is finding that current AI-enabled document management tools are not good at extracting the key conflict and peace themes that have surfaced in the consultations. The AI also cannot ingest handwritten notes, or cope with many of the national and local languages the Commission works in. She is working with a tech company to improve AI in local

languages, and to build conflict-and-peace specific large language models (LLMs) that might work better for National Dialogue topic-modelling purposes.

However, Aker is also facing other problems. In her local organization combatting sexual violence she is very aware that ‘Technology facilitated Gender-based Violence’ (TFGBV) is now a part of the experience of the women she works with. TFGBV includes women being targeted on social media with misogynist hate speech threatening violence, and also the increasing use of non-consensual intimate image abuse to try to intimidate women out of public political life. As an emerging young leader who is tech-aware, Aker has been drawn into high-level conversations with the social media companies as to how to prevent these forms of abuse. But an inadequate form of automated content moderation is all they seem able to offer, and they admit that with respect to some local languages they have no content moderation capacity at all. An international organization is now supporting Aker to encode hate speech terms to improve LLM-detection capacity in local languages and improve AI-driven content moderation. These efforts, in her view, could also help the National Dialogue Commission deploy strategic communications to counter misinformation and hate speech. She feels she is not just addressing her own problems but building a new infrastructure for future peacebuilders.

13.1.5 *Owen*

Owen is still working on satellite observation imagery to monitor climate change effects on crops. He works part-time at the university and is now also a part-time consultant with one of the key companies running a CEWS knowledge foundry system driven by AI. Owen’s role, however, is only consultative—he has advised on the data to run the programme—for example, roofs disappearing off houses as a sign of an armed group in the area. The company uses satellite imagery, past data, improved surveillance, ‘remote sensing’ by cameras on air balloons, and social media monitoring, to try to predict whether an armed attack is imminent.

The technology is amazing. Satellite data uses AI image recognition technology to visualize what weapons the imagery might be showing. The accuracy of the image matching is given as a percentage. This information is triangulated with photographs from social media pictures taken in the same area to confirm whether an armed group is gathering. If triangulation shows it is, the data goes to a military unit and weaponized drones

are launched. These drones target the armed actors but also scan and estimate the number of civilians in the area. The underlying computer system then calculates the combatant-to-civilian acceptable kill ratio, which is set to a ratio of one-to-one for civilian to lower-ranking combatants, and one-hundred-to-one for civilians to a high-level commander—a rate that has radically increased the number of acceptable civilian deaths since last year. There is supposed to be a ‘human in the loop’, and Owen understands that this involves last minute human review, involving a military data specialist and a military lawyer working under a time pressure.

Owen has a lot of qualms about even his minor role in a process that is linked to any use of force. However, not all wars are unjust, and even before AI was used many armed actors and villagers were killed in small conflicts. Now at least he is helping civilian protection and any killing is done by a regular army within some sort of ethical framework. Or so he hopes, as the army are in essence a party to the conflict. He nonetheless worries that the line between peace and war has become blurred, and AI now makes it difficult to understand how civilian-combatant distinctions are being operationalised. While he believes in just wars, he finds it harder to decide when one exists. Some days he muses that he no longer knows if he is on the side of the angels because he is not sure how far to trust the government that has commissioned the project, or the AI that drives it.

13.2 AI AND GEN-AI REFRESHER

While the stories are completely fictional, the AI developments are not. AI has many forms and these stories involved both traditional AI and Gen-AI (see Chapter 3). Indeed, I have found it more useful to think of AI as a field of study and techniques, rather than a set of tools, although clearly the term covers both.

As already set out, artificial intelligence is in the simplest definition computer intelligence that mimics human intelligence in ways that make it difficult to tell the difference (for a simple description of AI and terms for peacebuilders see Panic, 2020). But where did AI come from and how did it arrive on the peacebuilding scene?

In 1949, famous computer scientist Alan Turing described the ‘imitation game’, sometimes known as the ‘Turing Test’, as the test of whether a machine can exhibit intelligence equivalent to that of a human (Turing, 1950). This type of imitation has been the goal of Gen-AI, which works

by using large language models to define mathematical relationships between words to essentially predict what ‘might come next’ and thereby produce agile human-like responses to questions or prompts. Over the intervening decades, and particularly in the last one, AI and forms of Gen-AI have seeped into our lives in areas too numerous to chart—for example online language translators, Netflix predictions of what to watch next, shopping predictions on what ‘people like you’ might like to wear, and AI-driven chatbot assistants that aim to help you with customer queries with, say, your mobile phone provider.

Critical to Gen-AI’s development was a leap in the technology marked by a paper in 2017 called ‘Attention is All You Need’ (Vaswani et al., 2017). This paper introduced the idea of ‘transformers’ that essentially changed AI’s approach of moving from input prompt to output text through a long maths sequence in which things could and did go wrong, to lots of parallel processes that could put more ‘attention’ on components of the input, to then bring the insights together again. This approach has enabled Gen-AI to use ‘neural networks’ to be more attuned to the multiple different meanings in prompt questions and give more ‘human-like’ responses. The term ‘neural networks’ points to the ways in which the AI is modelled on the networks in our brains, which work to encode and decode many things simultaneously to form a picture of the world and interactions around us (AWS, 2025).

In 2022, this new approach resulted in ChatGPT 3.5 being launched by Open AI. ChatGPT 3.5’s new increased capacities to produce human-like answers that in many areas were accurate, took the world by storm. A new AI era began. The 2022 launch of ChatGPT 3.5 with a level of free access brought Gen-AI to the attention of ordinary individuals and businesses. It was closely followed by other models (see further Box below for current ‘top 10’ models, by use). The technology seemed to have multiple potential uses of scale across business, government, public life, and even peacebuilding. These uses include helping imagine new products, streamlining business processes, and even generating new creative works.

LMSYS Chatbot Arena Leaderboard (2025) is one of the first comprehensive evaluations of the public's LLM preference, using a test-and-vote system. Using this system the following were the most used chatbots 2024–5.

- Gemini-2.5-pro
- Claude-opus-4-1020250805
- claude-sonnet-4-5-20250929
- gemini-2.5-pro
- claude-opus-4-1-20250805-thinking-16k
- chatgpt-4o-latest-20250326
- gpt-4.5-preview-2025-02-27
- gpt-5-high
- o3-2025-04-16
- claude-opus-4-1-20250805

13.3 AI FOR PEACE

How then is AI being used as PeaceTech to end wars, beyond the examples of Conflict Early Warning Systems (CEWS) already addressed? Answers to this question will become outdated almost the next day (for good overviews of practice see Panic & Arthur, 2024; Howard & Valenzuela, 2025). For a review of relevant literature, see Giovanardi, 2024). Nonetheless, the following tasks are ones where Gen-AI uptake is flourishing and where AI-driven innovation is likely to persist because Gen-AI's added value is clear.

13.3.1 *Supporting Peace Mediation Analysis*

Document management. AI with Gen-AI capacity can help mediators, facilitators, and negotiators and their teams manage large-scale documentation. Peace processes produce massive amounts of information, including conflict analysis, intervention analysis, survey information, and information from large-scale public consultations. New AI capacities to document meetings with speech-to-text tools, or to create multiple translations, are increasing the documentary sources that can be used by mediators and local peace actors (Hirblinger, 2023a; Wäehlich, 2024).

Topics and themes can then be extracted from these documents using Gen-AI.

Supporting Inclusion. As we noted in Chapter 9, one of the criticisms of peace processes has been the ways that they tend to prioritise the agendas of the armed actors most responsible for the conflict, to the relative neglect of civilians who worked to end the conflict by promoting civicism and addressing root causes of conflict such as social injustice. AI is useful for reaching out to these communities, as it can help turn their insights into actionable propositions.

We have already looked at the processes in Libya and Yemen, where the UN used Remesh to survey local populations on critical peace issues, and then used AI to assist with interpreting results (see further Masood Alavi et al., 2022). There are a range of tools that enable this type of work, many of which are now AI-enabled—for example, Remesh now has a Gen-AI agent that can generate insights from collected data called Remy. AI can also help with pro-social survey design, to go beyond surveying, and also include mechanisms to explore areas of divergence and convergence—it can judge ‘sentiment’ or tone in responses and Gen-AI can suggest actionable insights from the material.

13.3.2 *AI-assisted Translation*

While perhaps seen as ‘unexciting’ as a PeaceTech application, Gen-AI offers improved capacity to work in multiple languages simultaneously. The ever-increasing capacity for automated translation is likely to prove one of its most profound positive effects in peace settings involving multiple national languages and international staff from different lingual backgrounds. Already, questions can be asked in one language, analysed using underlying LLM material in a second language, with answers produced in a third language. Developments in natural language processing, LLMs, and Gen-AI have reduced translation times, increased the volume of documents that can be dealt with, improved translation quality, and increased the scope of languages covered (see Farquhar, 2025).

We engage in peace agreement translation and have used human translation, machine-assisted translation, and also AI translation alone to get a ‘rough-and-ready’ sense of document content to inform what translation will be needed. However, we have also found some shortcomings with wider implications for how Gen-AI translation is used for other

purposes in conflict settings, including English-language bias in training data (because English sources vastly outnumber other language sources), and lack of expertise in conflict and peace concepts. Gen-AI can also have further limitations in grasping cultural nuances in peace and conflict settings or dealing with the very specific terms that can arise in conflict settings (see further Farquhar, 2025). These issues, of course, can also be a problem for human translators. Gen-AI-assisted translation is likely to improve over time, and be built into ever more tools, including the new high-tech glasses Meta thinks people will want to wear (Jamali, 2025a).

13.3.3 *Changing Conflict Attitudes During a Peace Process*

There are many examples of pro-social tools of deliberation being used in peace processes or ongoing situations of nascent conflict to try to create engagement across divided lines and help move people from polarised views to some common understandings (see Schirch, 2025). Gen-AI is now being embedded into these tools (see e.g., Arnesen et al., 2025; Tessler et al., 2024).

13.3.4 *Assisting Drafting Peace Agreements and Constitutions*

LLMs and Gen-AI are beginning to be used to support fast access to comparative peace agreement drafting options and even to suggest draft text. Working with past agreements as precedent for future ones is work that existed before AI. Examples were touched on in Chapter 12 and include my own work on peace agreements (Bell, 2000, 2008), work on ‘Lawyering Peace’ by Paul Williams (2021), the comparative agreement work emanating from the Kroc School Peace Accords Matrix (see PAM, 2025a), and Marc Weller’s work at the University of Cambridge, which generated a ‘Language of Peace’ Tool (Language of Peace, 2025).

Gen-AI is opening-up new possibilities for precedent gathering and analysis. Our own work has developed a Gen-AI assisted LLM to identify peace agreement topics. We are working to use Gen-AI with our PA-X data to enable user-driven recommendations for how agreement topics and issues can be drafted, with a chatbot interface for end-users. There have been some other specific conflict-focused projects that go in this direction, for example an attempt to use AI to design an agreement for Ukraine, using an interactive tool (CSIS, 2025); or the Akord project’s

website innovating how to provide AI-driven information for use in any peace process in Sudan (Akord, 2025).

Constitutions are often a key mechanism by which peace agreements are translated into new institutional rule-of-law structures. Scholars at the University of Texas, have suggested that AI has a role to play in constitution making and tasks such as initiating agendas, consultation, deliberation, and drafting (Albert & Frazier, 2025).

13.3.5 *Negotiation ‘Intelligence’*

AI, often involving a mix of traditional and Gen-AI, is now also being used to produce what might be understood as ‘negotiation intelligence’—that is, information about the mediation perspectives of the conflict parties and diverse mediators involved in the process. This information can include understandings of past negotiation positions, conflict positions, modes of negotiation, and underlying incentive structures. For example, our own PA-X work has combined ‘named entity recognition’ and expert research to understand who signs peace agreements and what types of content they focus on (Henry, 2024). In addition, using LLM-related techniques to build on the work underpinning the PeaceFem app, we have produced new data on when and how women sign peace agreements.

Double-disruption dynamics mean that more agile ways of understanding relationships between mediators and conflict parties, and the past mediation approaches of both, is critical. There will often be many new and less-known mediators in a conflict, and many more armed groups to deal with. If peacebuilding is to respond with new ideas regarding how to support different mediation pockets to cohere, then analysis of mediation positions is vital. Systematic understandings of past mediation approaches by conflict and international actors were not possible before large-scale peace process data had been created. However, this information now exists in PA-X and sister projects and can now be subjected to new forms of analysis using LLMs and Gen-AI.

13.3.6 *Supporting Discrete Peace Implementation Tasks*

AI can be useful to a range of post-peace-agreement implementation tasks. For example, in local agreements, access to local resources is often a matter of dispute between neighbouring communities, with issues like

cattle rustling featuring prominently in local peace agreements (see PA-X Analytics, 2025c). A range of AI-driven tools and projects now help to map local resources to prevent conflict and monitor information of agreements. For example, the Water Peace and Security project (2025) has formed a partnership with Mali to predict and mitigate water conflicts, using participative tools but also including AI-driven agent-based and hydrological-based models to anticipate conflict, all of which can be explored on dashboards using maps. This type of information can be critical to underwriting cross-border local agreements which have been mediated to de-escalate a complex conflict system of localised conflicts, such as those that span the Sahel, as illustrated by the agreement between the Daoussahq community in Talatayt (Mali) and the Peulh community in Niger on the peaceful exploitation of natural resources (Mali/Niger, 2016).

13.3.7 *Tailoring Strategic Communications in a Peace Process*

AI can be used to improve strategic communications for peace. LLMs and Gen-AI provide capacity to ‘listen at scale’ by using data such as social media posts to gather and analyse views. Gen-AI can then be used to suggest effective counter-messages. Build Up’s Phoenix tool (2025d) puts social-media text-mining capacity in the hands of peacebuilders, enabling them to gather posts and comments within specified parameters and to classify and explore them. UN Women has also used AI to enhance its analysis of online conflict dynamics by looking at gendered violent social media narratives in Bangladesh, Indonesia, Malaysia, and the Philippines. It used this information to better inform peaceful counter-messaging and gender-sensitive peacebuilding interventions (UN Women, 2023). Gen-AI and social media analysis have been identified as mechanisms for strategic communication in settings such as Colombia (see, Quinchía-Saavedra et al., 2025).

13.3.8 *Frontier AI for Peace Experimentation*

To these areas of Gen-AI PeaceTech development, a set of recently emerging more experimental AI work can be added. These are Gen-AI driven innovations that aim to open new frontiers in what AI is used for in creative ways.

Didi. We have already touched on Didi (2025). It is a company that attempts to use AI-driven analysis of media sources to try to identify whether there is a ‘ripe’ moment for negotiations to be mounted. This tool uses AI mechanisms to pull and evaluate media sources, coupled with forms of sentiment analysis. It then provides assessments of whether a ‘mutually perceived hurting stalemate’ has been reached. At present Didi operates only with respect to the Israeli-Palestinian conflict, and in using media can only assess public positions of parties. It cannot therefore provide a direct evaluation of Israeli government and Hamas views. Nonetheless, Didi shows an innovative use of AI that has potential to at least show when public appetite for negotiations is highest.

Ask Amina and Abdalla: Agentic Avatars. An experimental use of AI agents was developed for UN University (UNU) by Eduardo Albrecht (2025b). This project designed agents with avatars, using Gen-AI and a technique called Retrieval-augmented Generation (RAG), which directs AI chatbots to authoritative pre-determined sources. Avatars were created in the form of Amina, a fictional refugee from Sudan, and Abdala, a fictional member of the Rapid Support Forces, the key paramilitary group involved in the conflict. People could ask questions to these avatars to help them understand the experience and positions of refugees and armed actors. There are multiple challenges with this project, which Albrecht himself highlighted. Nonetheless, the experiment shows that, while not a substitute for talking to people, agentic avatars could be useful for training purposes or to trial mediation positions as part of preparing for a meeting. This type of development seems likely in the future.

Conflict Population ‘Digital Twins’. ‘Digital twins’ have emerged primarily in the field of physical engineering. While definitions and types of digital twin vary, at core a digital twin is a comprehensive digital representation of a physical thing, process, or system that includes the properties, condition, and behaviour of the real-life version. The digital twin can be put through simulations that model how things might work under a variety of possible conditions in the ‘real world’ (see e.g., Haag & Anderl, 2018, p. 64). Digital twins are used to understand complex processes where it is difficult to predict how a scenario involving a particular object, process, or system will play out. The behaviour of digital twins is valuable because it can be used to modify a product or practice without having to wait to learn from risky mistakes in ‘real life’.

Digital twins of populations are beginning to be employed for things like ‘urban planning’, and in the PeaceTech field some entrepreneurs

are considering whether ‘population-wide agent/avatars’ could be constructed to model and predict how a population might respond to a proposed peace initiative. Like Albrecht’s avatar experiment above, conflict population digital twins would only be as good as the underlying information used to construct them. However, theoretically at least, Gen-AI could use population surveys, interviews, media (social or general), and reports to create some sort of disaggregated population model, against which to test propositions for ending the conflict. Albrecht sees his work in going in this direction (see Albrecht, 2025c), and Culture Pulse is working on what it claims is the ‘world’s first psychologically accurate digital twin of a nation’ in Slovakia (Culture Pulse, 2025). Similarly, an experiment at Stanford University has used interviews and large language models to simulate 1052 people’s personalities, they claim, accurately (Stanford HAI, 2025b).

AI-Mediation Training and Solution-Focused Ideation. Focusing more on enabling mediators of all sorts to use Gen-AI in support of negotiations, Frontline Associates (2025) has created a not-for-profit AI Negotiation Challenge (2025) that supports the use of AI as a partner in crafting solutions to complex problems in negotiations, using simulation-based training. This initiative addresses not just the use of AI, but the types of new skills that may be needed in the field. Unlike initiatives that aim to use AI for ‘efficiency’, the AI Negotiation Challenge pushes towards the creative use of AI as an ideation partner in complex high-stakes settings that can be tasked to draw on underlying negotiation models and theories.

13.4 SHAPING AI DESIGN AS PEACEBUILDING

These uses of ordinary and Gen-AI are core to attempts to mediate ends to conflict. However, they miss one of the main areas of engagement between peacebuilders and AI, namely: engagement to influence the design of AI models to better serve peacebuilding interests. This type of activity was illustrated by Aker’s story, and her attempt to find ways for Gen-AI to engage better with hate speech or operate in local languages. Attempts to influence Gen-AI design and regulation are key PeaceTech areas as we return to next chapter.

13.5 HOW IS GEN-AI CHANGING PEACE TECH WORLD?

How then is Gen-AI changing the practice of ending wars, and what value is it adding as a tool of digital PeaceTech innovation?

13.5.1 *Augmentation, Substitution or Transformation: AI Reconfiguring Agency*

AI solutions are quietly being built into PeaceTech in a range of ways. What value do they add? In business settings AI value is often evaluated in terms of whether AI ‘augments’ existing capacities or ‘substitutes’ them (see e.g., Jiang et al., 2026). Both augmenting and substituting have value but have different wider implications for how the business is staffed and workflows ordered. In PeaceTech world, AI is currently largely augmenting current conflict-resolution capacities, for example by enabling tasks like consultation to happen at greater scale in more automated ways. AI is increasingly becoming a component of existing ways of working, even informally, or being built into new PeaceTech tools. Build Up’s Phoenix tool, for example, uses simple AI-assisted tools for classification.

However, some of the more experimental technologies, although designed to ‘augment’, have potential to ‘substitute’, and not always for the good. For example, ‘Ask Amina’ has generated debate as to whether having an avatar might risk people not seeking views from real refugees, who can be easy to meet and survey. It is possible that digital twins could also be seen as a shortcut to actual consultation, particularly with difficult-to-reach populations. Yet, ongoing real-world engagement and data collection will remain important, including to initiatives like ‘Ask Amina’ and digital twins, as both require updated data to underpin them.

As these last two examples illustrate, AI and other digital systems set out in the book stand to reconfigure who has agency in peace processes. Agency does not depend on whether augmentation or substitution is taking place, but on the ways that AI reconfigures relationships and agency in practice by enabling or disabling engagement between practitioners of different types, by enabling or disabling transparency, and by enabling or disabling ethical use of population data. Using AI for peace requires constant questioning of what forms of agency are being enabled and disabled by AI. Some matters are obvious, but some require understanding how the underlying technologies make invisible choices.

13.5.2 *Ecosystem Changes*

It is also worth pointing out that Gen-AI is changing the PeaceTech ecosystem described in Chapter 7 in a range of ways.

Fast-paced change. Perhaps Gen-AI more than any other technological development is driving a fast pace of digital change, including in the PeaceTech area, with new models and AI initiatives almost daily. For example, Stanford University’s Annual AI Index Report (Stanford HAI, 2025a) documents large increases across the board in all measurements of AI, including: number of AI models (with shorter times between model release); number of companies using AI; research publications on AI; energy use of AI; accuracy of AI; development of accuracy measurements of AI; amount of regulations for AI; and number of ‘AI incidents’ (records of malfunctioning). For those seeking to expand their PeaceTech repertoire by using Gen-AI, keeping up with the pace of change is itself a challenge.

AI is intrinsically connected to disruption of global order. AI development is driven by a small number of dominant companies who have CEOs who have a form of political power. It is impossible to understand the impact of Gen-AI on our world without understanding its connection to global power. The role and motivations, rivalries, country location, and financial leverage of the companies and individuals drive the main Gen-AI models. This is a longer story than this book has space for, and is well addressed elsewhere (see e.g., Hao, 2025). It is important, nonetheless, to note that Gen-AI is creating company and individual wealth and political power that is a complex part of the changing world order that is creating new tapestries of war and peace. For this reason, peacebuilders often understand that they cannot engage with AI without engaging with the complex power relations that have produced it. However, peacebuilders are a very small constituency in this rather large AI world with little power to shape large companies. There are, however, other AI options to consider, for example LLMs developed ‘for the public good’ such as the Swiss AI initiative by EPFL, ETH Zurich, and the Swiss National Supercomputing Centre (CSCS) (ETH Zürich, 2025c; Swiss AI-Initiative, 2025).

New AI PeaceTech companies. The PeaceTech ecosystem is also being changed by the emergence of new types of company, and the new interest of Venture Capital (VC). In re-writing this book, it has struck me that AI has accelerated this PeaceTech ecosystem change so fast that it is

difficult to capture all the changes or understand their implications (cf., Hirblinger, 2023b).

In the last two years, two new types of AI company are rapidly emerging. First are companies that write cool programmes that essentially provide a wrap-around interface for a particular use of Gen-AI to enable non-technically minded people to do things they could not do before, such as build a website or an app in a few minutes (see e.g., Trickle, 2025). Second are companies that work to refine large language models to try to make them ‘work better’ for more specialist domains of expertise where the big Gen-AI models may not be specialist enough (see e.g., Vaidik, 2025). Sometimes the latter companies produce their own LLMS but more often they fine-tune one of the main models such as Open AI’s ChatGPT. These types of AI company are also rapidly emerging in the dedicated PeaceTech space, as some of the examples above illustrate.

AI PeaceTech companies are now being understood as part of a sector that could be commercially profitable. Increasingly, PeaceTech is attracting interest as a potentially profitable sector that could attract VC. VC involves investors who support a company at an early stage of its lifecycle through funds and expertise to build the company and then exit having gained profit. B Ventures (2025) is a platform that aims to connect venture capital with PeaceTech start-ups and suggests that PeaceTech could be an \$100 billion industry in the next ten years (Martin, 2024). Whatever the figures, the idea that PeaceTech could be a key corporate growth sector is a new dynamic.

Investor interest in PeaceTech has both tremendous potential and some risks. Typically, VC investors make short-term tech investments to start-ups that banks cannot support, with the idea that contributing their expertise and money over a short period will enable the start-up to become viable and scale. At this point a larger company or equity bank will buy out the investor, returning the investor’s money. This trajectory means that the big AI companies, or equity banks, are likely to be the ultimate owners of PeaceTech companies. The company’s core mission may not be diverted, but these types of investment will create a new type of ‘peace actor’ with quite different motivations from a peacebuilding sector currently populated almost entirely by not-for-profit enterprises.

Given that large commercial interest has been key to driving war technology, harnessing investor capital more firmly to conflict resolution efforts is interesting and positive, particularly given the shrinking space and funds for civil society not-for-profits. However, PeaceTech-for-profit

also has risks in terms of whether PeaceTech can remain aligned to conflict resolution values and the conflict-affected populations that peacebuilders consider their ‘real clients’, while simultaneously meeting the profit objectives of investors. PeaceTech-for-profit is something that conflict resolvers and local communities are relatively unfamiliar with.

AI PeaceTech Skills and Jobs. Finally, Gen-AI is changing the PeaceTech ecosystem by requiring new skills and types of job that have not hitherto been core to peacebuilding NGOs and international organizations. The AI Negotiation Challenge described above responds to this reality. New skills and jobs needed include: AI integration skills with jobs for people who can assist organizations to integrate AI into workflows and operating models (Farquhar, 2026); ‘prompt engineering’ skills for maximising AI and reducing hallucination or poor-quality answers; and staff trained in AI ethics and risk assessment, who can advise on how to avoid or mitigate risks. Using AI effectively will require a generation of peacebuilders with these skills. As we examine more next chapter, other peacebuilder roles may require fewer people or disappear altogether, perhaps creating unforeseen skills gaps down the road.

13.6 CONCLUSION

Gen-AI is a positive development. It is racy, exciting, and challenges peacebuilders to be experimental. It opens up new capacities, such as ‘listening’ to public views on a peace process at scale; improving translation and forms of strategic communication; or providing innovative insight into negotiation possibilities, interests, and positions. However, along with the opportunities and the innovation, come challenges that derive from the limitations of Gen-AI. These challenges must be addressed and mitigations designed for conflict risks. We turn to these in the next chapter.

Questions

1. What are the different types of AI? Which are you familiar with, and which are you not familiar with?
2. Which types of AI do you see in your life? What AI tools do you use, and what for?

3. What uses of AI seem valuable?
4. What uses of AI worry you?
5. What do you see as the exciting possibilities of AI in peace-building and mediation?
6. What do you think about the prospect of more commercially self-sustaining PeaceTech?

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AI Challenges

Abstract Is AI worth the hype? AI, and particularly Gen-AI, is improving almost daily provoking discussion as to how it will transform a broad range of activities. Hype regarding both AI's potential and its possible risks can look extreme. However, AI's future and the scale and pace of transformation remain somewhat unpredictable. What then are the implications and challenges of AI, and in particular Gen-AI, for the peacebuilding field? This chapter examines the challenges and opportunities that AI as developing technology brings. I consider how these play out in a conflict and peacebuilding context and what mitigations are possible?

Keywords Generative AI · Hallucination · Misalignment · Prompt engineering · AI futures

14.1 IS AI WORTH THE HYPE?

AI as a field has its own techno-pessimists focusing on risks, and techno-optimists focusing on benefits. Interestingly, AI pessimists exist even among AI experts who are broadly techno-optimists and include some of the CEOs or chief technicians who have created the main Gen-AI models (see e.g., The Robot Brains Podcast, [2023](#)). Gen-AI often produces 'super-pessimists' and 'super-optimists', in part because the

opportunities and risks appear more extreme than with other technologies. Regarding divisions between those who see technology as a ‘new tool to be used for good or ill’, and techno-determinists, who understand tech as substantively changing the nature of the task, with regard to Gen-AI everyone is techno-determinative. It is broadly recognised that AI has the capacity not just to help us do tasks, but to fundamentally change how we do those tasks, and accordingly will change how public services, businesses, and even the jobs market will look in a couple of years’ time. For a fun (if somewhat apocalyptic) speculation on the super-intelligence future AI could lead to by 2027, see the AI Futures Project report, *AI 2027* (AI Futures Project, 2025; Kokotajlo et al., 2025). There are two additional definitions that are useful to understand Gen-AI-speculative futures.

Artificial General Intelligence (AGI). AGI is a speculative form of AI that moves beyond Gen-AI to be able to cope with any task a human can, rather than the focused tasks that Gen-AI performs largely accurately today. AGI does not exist yet, but has been presented as the ultimate holy grail of Gen-AI, particularly by Sam Altman Open AI’s CEO (see e.g., Altman, 2025).

Super AI. Sometimes ‘Super AI’ is presented as an even higher form of future Gen-AI that would not merely emulate all human thinking, but be powerful enough to surpass it (see Kokotajlo et al., 2025).

When approaching AI for peace, it is worth balancing hype with three current AI realities.

14.1.1 *AI Is Not Magic*

AI is not magic. It does not produce new knowledge the way humans do. At heart it uses existing data to predict responses and is only as good as the data it draws on. However, both traditional AI and Gen-AI have extraordinary capacities to extract, synthesise, and blend existing knowledge in ways that can outpace human capacity. In this sense it adds to knowledge (see further Crawford, 2021). Yet, Gen-AI tends to be better at focused tasks where there is a lot of information than at specialist tasks with limited data resources. Conflict settings vary hugely in the amount of analysis that they generate, and in the early days of 2022, we certainly found that ChatGPT’s responses on conflict contexts was patchy, although there are now improved ways of attaching the relevant knowledge to tasks.

14.1.2 *AI Is Experimental*

AI is still an experimental technology, whose development journey is proceeding apace. As noted last chapter, the capacity of Gen-AI has increased dramatically since late 2022. New models are now released after shorter and shorter timespans. However, Gen-AI is still a work-in-progress with well-known problems, including ‘hallucinations’ such as the invention of peace agreements just mentioned, although as we will see these problems do not arise in all use-cases.

14.1.3 *Gen-AI’s Destination Is Unknown*

It is largely unknown what Gen-AI will ultimately deliver. It is therefore hard to separate hype about its possible future from achievable uses and outcomes in the present. The future capacity of Gen-AI, and whether the hype is ‘worth it’ or ridiculously overinflated, is a topic of hot debate—even among AI experts who are all broadly enthusiastic about the concept (see e.g., Marcus, 2025a, 2025b).

14.2 LEANING INTO AI

Despite these caveats, the hype that was largely triggered by Gen-AI in my view is merited. Peacebuilders will need to find ways to engage with AI of all forms. As Valarie Sticher has pointed out, AI of ordinary and generative types is here to stay (2025). She argues that debates about whether the hype is worth it can stand to miss the reality that AI is already significantly re-shaping our world, including peacemaking, and therefore must be engaged with.

I agree and would add to Sticher’s observation that peacebuilders must engage with AI because the coincidence of an exponential change in the peace and conflict fields and surrounding world order is creating an unnavigable peace mediation landscape that is itself part of a double-disruption dynamic. This new landscape calls for the type of agility AI brings.

The strong sense that ‘something new’ is going on is channelling huge resources into efforts to improve AI. These resources and the AI ‘arms race’ between countries will profoundly change our world. The money invested this far has produced new Gen-AI models at speed and placed AI at the centre of complex battles over the future of democracy, social

polarization, and choices between war and peace. The main AI companies, as already noted, are themselves an integral part of the current global re-ordering and citizens concerned to promote ‘civicness’ must reckon with them.

In the peacebuilding world, as with most of PeaceTech, the early uptakers of AI for peace are trying to work with the good while navigating the bad. As noted last chapter, they are often also engaged in pushing for ‘pro-social’ design of AI itself in an attempt to create a world that would ‘product-design-out’ the bad elements, as Aker’s story illustrated.

What then are the risks of ordinary and Gen-AI generally? Which do we need to take seriously in the peacebuilding field in particular? And how can they be mitigated?

14.3 AI CHALLENGES AND MITIGATIONS

Both optimism and critical engagement with AI are useful. As with all new technology, debate continues over AI’s potential benefits and challenges. Challenges can be inherent to the technology (systemic challenges) or can be down to poor use (user challenges). System and user challenges of AI have heightened salience in the peacebuilding field due to the high stakes and high-risk nature of the domain, as the discussion below illustrates. In the AI domain, system and user challenges can be hard to separate, as some system challenges can be largely mitigated by improved use of AI tools.

14.3.1 Gen-AI Is Too Error-Prone in Peacebuilding Domain

Challenge. A central risk for Gen-AI in the peacebuilding field pertains to whether it can provide good peace and conflict resolution analysis. Gen-AI is best at giving specific information on bounded subjects and worst at dealing with complex problem solving, in part because AI struggles to take context into account when giving answers (Crawford, 2021; Marcus, 2025a). Conflicts are characterized by complexity rooted in local contexts and peacebuilding is rooted in experience and expertise regarding what drives conflicts. There are never simple answers as to how to find an exit route. As regards what Gen-AI has to draw on, both good and bad conflict analysis abound, with the additional problem of disinformation. Often the most publicly accessible information comprises political

responses to situations, with more evaluative in-depth conflict analysis often hidden within organizations.

A recent study by Natalie Bussemaker and Mark Freeman from the Institute for Integrated Transitions (2025) gave three conflict scenarios to six main AI models and asked them for advice. They then used a team of mediators to evaluate the answers according to ten criteria relating to matters such as whether the model asked questions about context. Did the model do due diligence over the prompter's identity and goals? Did it focus on results rather than ideology? They found that '[t]he average score was just 26.7 out of [a possible] 100, and most models gave extensive advice without asking basic clarifying questions or acknowledging the physical safety dangers involved.' Although when follow up questions/prompts were made, the top score rose to 59 out of 100 (Bussemaker & Freeman, 2025, p. 3).

Mitigation. While there are limitations to Gen-AI, some of these are user-challenges rather than the systemic challenges with the technology they might appear to be. Better design of 'prompts' can push Gen-AI to better answers as Freeman and Bussemaker demonstrated, and in other contexts prompt design involves digital twins, juries, and feeding in better underlying assumptions. 'Prompt engineering' has become a skill in itself, with techniques such as zero prompting, one-shot prompting, iterative prompting, chain of thought and tree of thought prompting (see further Zhang et al., 2024). Prompts can ask certain knowledge to be taken into consideration or ask the AI chatbot to justify its results. Furthermore, additional information can be used to support the analysis—Gen-AI models now also enable documents to be uploaded and answers to be derived only from those documents (Google NotebookLM, 2025 is my favourite tool, partly because it has a 'podcast' function that is really rather fun). Retrieval Augmented Generation (RAG) models can retrieve information from a prescribed knowledge base and combine it with an LLM to ground the response. These techniques can limit error and hallucination issues, and improve analysis, even though they still work on a basis of retrieval rather than understanding the context or relationships in the information. It is also worth remembering that most of the PeaceTech AI use cases identified last chapter did not involve asking Gen-AI to create free floating analysis. Tasks such as extracting information by topic from large-scale documentation, such as a National Dialogue consultation produces, use Gen-AI to assist with topic classification, and document comparison. These types of use can often produce

highly accurate results on a scale and at a pace that human review could not manage.

14.3.2 *Hallucination and Misalignment*

Challenge Hallucination. In addition to low quality results, Gen-AI can produce output that includes information about things that did not happen. In our early attempts to use ChatGPT 3.5, we found responses to questions even invented peace agreements. These inventions are often called ‘hallucinations’ and arise because Gen-AI draws on existing data but always tries to produce answers and so can make things up when faced with a lack of data. Measurements designed for measuring hallucination found that, ‘[c]urrently, the GLM-4-9b-Chat and Gemini-2.0-Flash-Exp models are tied for the lowest hallucination rate, each at just 1.3 percent. The next closest models, o1-mini and GPT-4o, follow closely, with hallucination rates of 1.4 percent and 1.5 percent, respectively’ (Stanford HAI, 2025, p. 171.) However, even a hallucination rate of 1.3 percent can be critical in a conflict-related use.

Challenge Misalignment. Alongside simple hallucination, AI has a more hidden ‘alignment’ problem (Amodei, 2025). Central to the field, and constantly debated among Gen-AI specialists, is how to keep AI responses aligned to the tasks and human values in ways that users expect. Gen-AI can produce answers that are ‘misaligned’ with the values of the person asking the question, or with accepted human values. This issue has not been particularly emphasized in PeaceTech discussions to-date, although the IFTI study did illustrate a misapprehension of safety risks in AI-recommended mediation responses, and in July 2025, the Grok chatbot responded to questions about racism by praising Hitler (Taylor, 2025).

However, insofar as peacebuilders are working to ideate solutions using Gen-AI, it is important to anticipate and mitigate against misalignment.

Mitigation. Gen-AI providers are working constantly on hallucination and misalignment. In PeaceTech applications having humans firmly in the loop is important to check and correct AI results. However, again different techniques and applications will have different levels of risk. For example, in our PeaceTech use of Gen-AI we work with a set of peace and conflict terms and classifications and use Gen-AI to extract information from peace agreements. This approach eliminates hallucinations, because

it roots queries in the context of expert topic elaboration against a corpus of existing documents.

14.3.3 *Baked-In Bias and Lack of Explainability*

Challenge. AI can build in bias in several ways, as a large body of literature attests to (see e.g., Hanna et al., 2025). The underlying data can be biased, the training models can be biased, and bias can emerge from lack of training data, such as when minority views are underrepresented. Bias is of critical concern in the peacebuilding field, where issues of equality are critical to conflict resolution. There are other significant potential biases that are relevant to peacebuilding. We noted, for example in Chapter 2, that peacebuilding has often had more resources for research in the Global North. AI is therefore likely to bake in a Global North perspective on the Global South (see further Gichuhi, 2025). The capacity of AI to deal with a range of languages also exhibits a form of bias, since lesser-known languages are not as well covered as more common languages. As Aker's story illustrated, working with AI's language biases requires understanding of contextual use of speech, particularly when hate speech or misogynistic views of language are culturally coded, and may not be easily recognised by simple semantic similarity tools.

A key issue is that biases may not always be evident to the end-user. A challenge exists of AI explainability. The ability to open AI's black box and understand what biases may have been built-in will be beyond most peacebuilders. Such concerns were reflected in the stories in the previous chapter (see Conall's, Atem's, and Aker's stories).

Mitigation. The mitigations involve understanding and supplementing the data supplied to the chatbot and ensuring that humans are included in the loop. Another key mitigation is to work to understand the biases of Gen-AI use. Gichuhi argues that '[i]nvesting in researching the suitability of these tools for peacebuilding in African contexts is crucial' (Gichuhi, 2025, p. 10). It is also important to consider whether Gen-AI is the best tool for the job before rushing to use it. These types of consideration are addressed further in Chapter 15 on PeaceTech Praxis.

14.3.4 *AI Data ‘Theft’, Privacy, and Future Lack of Data*

Challenge. Gen-AI depends on data in the form of published work, web content, and even social media. A lot of the data models used for ‘training’, particularly in early phases, was copyright-protected but no payment was made to authors or publishers. Training data involves data that is used to create large language models that can be used to train AI models. The more specialist the area, however, the more ‘what comes next’ replicates just a few sources. Apart from pure copyright concerns, there is a concern that if incentives to produce original writing are removed by AI, the amount of ‘data out there’ for AI to train on will decrease and AI models will fail to develop. However, the copyright issues are also currently being litigated in various jurisdictions including the United States, and Anthropic has agreed to pay a \$1.5 billion settlement to authors (The Author’s Guild, 2025).

These issues have relevance for PeaceTech applications, because they point to fundamental questions around Gen-AI’s sustainability and business model. Ongoing research and conflict analysis is needed to supplement, check, and fuel future AI models. There is a danger in PeaceTech world that donors funding peacebuilding analysis and data will not realise the extent to which tools such as Gen-AI rely on that data for insight.

Mitigation. If Gen-AI is to use information fairly and preserve incentives for research and analysis, the funding models will need to change. However, it is also necessary that peacebuilding funders understand the importance of ongoing research and analysis and recognise that interactions with conflict-affected populations, and good quality research, are needed on an ongoing basis. The need for original data cannot be replaced by AI, not least because ongoing Gen-AI quality in the peacebuilding field depends on it.

14.3.5 *Hacking-Vulnerabilities*

Challenge. All tech is vulnerable to bad people using it for bad purposes, and to forms of ‘hacking’ where bad people subvert efforts to use tech for good. As regards Gen-AI, subversion can include prompting the model to respond differently to its original instructions or introducing disinformation into training data. There are concerns that LLMs themselves may be very vulnerable to being hacked by malevolent, anti-peace, or even merely maverick actors (see e.g., Poireault, 2023).

Mitigation. The more that peacebuilders use Gen-AI the more they will need to think about when and how hacking might happen. This will be more of an issue when bespoke LLMs are developed by modifying proprietary AI. For now, users of large-scale open Gen-AI models will have to rely on the security of those models. Peacebuilders will need to be literate in AI vulnerabilities, and aware of the heightened threat that happens in conflicts, particularly when peace processes start to put in place a transition to a new order.

14.3.6 *De-skilling of Activists and Professionals*

Challenge. As AI undertakes tasks such as ‘summarising reports’ or ‘extracting relevant conflict resolution insights’, it may lead to a broad set of ‘early-stage career’ tasks being eliminated. Often these early-stage career tasks, while not the most exciting, were important to training staff in matters such as modalities of accountability for funding, understanding country conflict contexts, or even in the language and modalities of peacebuilding. There are fears across business settings beyond peacebuilding that AI might de-skill work forces. This challenge also arises for peacebuilders.

Mitigation. Gen-AI should not simply be used as a tool for ‘efficiency through replacement’ but rather as a tool for ‘augmentation and release of creativity’. It should be used as a tool to enable the types of in-country engagement that Seán longed for but found squeezed out in the burden of bureaucracy. It is likely that in the immediate future the least ‘sexy’ use of AI for peacemaking will also be its main use. That is, as a tool for dealing more efficiently with the institutional and financial bureaucracies that accompany how peace processes are administered. However, perhaps the better approach is to re-think how these bureaucracies could change, and what elements are now redundant. Instead of using AI to do old business faster, could AI be used to change the entire model of how projects are co-created and mounted? How AI is used will be crucial to whether AI brings progress or more complicated bureaucracies. Critical to innovative use will be finding people who can work as ‘bridgers’ or ‘AI integrators’ to connect technology and peacebuilding (see further Farquhar, 2026).

14.3.7 *Loss of Jobs*

Challenge. In our stories, Seán and Conall worried about their jobs and becoming completely replaceable. This is a wider business and human concern that now figures largely in Gen-AI debates. Public debate and literature include almost constant speculation as to which jobs will survive Gen-AI, where new types of job will emerge, and what the end balance between job losses and gains will be (Kelly, 2025). In the peacebuilding world, a range of even mid-level jobs involving conflict analysis could be lost. The concern about loss of jobs comes against a wider backdrop in which peacebuilding funding has dropped radically in the last several years.

Mitigation. Gen-AI may see peacebuilding organizations lose staff, but this may happen anyway due to other reasons. Gen-AI also has potential to help civic organizations sustain activities when facing cuts. New types of PeaceTech jobs will also be created. It will be important for peacebuilders to reskill to be confident in prompt engineering, AI integration, and handling new AI ethical and risk concerns.

14.3.8 *Human Disconnection, Active Un-Knowing, and Non-Relationship-Building*

Challenge. Less discussed in business settings, but—in my view—of central concern in peacebuilding settings, are problems of human-disconnection that Gen-AI brings. The stories in the last chapter capture the idea that at some point AI products may essentially start talking to each other. This fear arises in other business settings, where job applicants and employers all design AI systems to write and evaluate CVs.

What happens when both on-the-ground peacebuilding actors and the international organizations that fund them exchange AI-generated products? Automation can eliminate disagreement and pushback that are crucial to good conflict analysis. AI could remove the type of exchange that is crucial to joint analysis, relationship building, and co-creating solutions. Whether between conflict actors or between international donors and local communities, trust building is essential. As is human agency. Trust will not be built by machines responding to each other's auto-generated reports. As AI reduces human interaction, we must enable people to remain connected.

Mitigation. It is important for peacebuilders to consider the ways in which knowledge is produced and to consider what would happen if all the informal face-to-face ways of learning about a conflict and peace process were to slowly disappear. Even weak social ties are a powerful mechanism for diffusing information (see Granovetter, 1973).

14.3.9 *Environmental Costs*

Challenge. Seán worried about the environmental consequences of his organization's move to AI. He was right to. Energy and water consumption is staggeringly huge, consumed by huge data centres that not only take energy to run, but water and energy to cool. The International Energy Agency (IEA) estimates that a 'typical AI-focused data centre consumes as much electricity as 100,000 households, but the largest ones under construction today will consume 20 times as much' (2025). The environmental costs of AI are a challenge for humanity. They have a particular significance in peacebuilding contexts where the links between environmental challenges and conflict are now a matter of growing concern (see Krampe et al., 2024). Conflict is generated by disputes heightened by climate change. For example, the Great Ethiopian Dam project saw disputation with potential to involve military use of force between Ethiopia who were building the dam, and Egypt and Sudan who rely on the Nile's downstream water. The links between the new environmental realities brought on by climate change and conflict within and between states are varied and multiple. Against this background peacebuilders have to figure out how to engage with a tool that holds potential for solving environmental problems such as conflict but is itself hugely environmentally destructive.

Mitigation. This is a difficult problem to mitigate, and I have been surprised how little it has featured in Gen-AI and peace discussions that I have attended. It is perhaps tempting to think that peacebuilding gains outweigh environmental losses, or that AI may be no worse than other 'dirty' industries, or that this is a tide that cannot be held back so we need to swim with it. AI companies are themselves working to reduce environmental impacts with considerable success. However, overall energy and water demands are rising on a massive scale that looks set to continue. The Stanford AI Index notes that overall 'training compute for notable AI models doubles approximately every five months, dataset sizes for training LLMs every eight months, and the power required for training annually'

(Stanford HAI, 2025). I do not have an answer, but the peacebuilding community will have to develop one. A simple starting point would be to push AI companies to produce individual and organizational calculations of the energy used in their queries, like airlines now often do with carbon emissions per flight.

14.3.10 *The Biggest Peacebuilding Gen-AI Risk*

The biggest risk of Gen-AI for peacebuilders may be the simplest risk: that it may be misunderstood and mis-used in the peacebuilding setting, and that peacebuilders may fail to understand the ways in which AI processes re-shape political agency and decision-making. The key mitigation is to establish forms of training in AI literacy and transparency, and to ensure that human expertise and networks do not disappear.

14.4 RESPONSIBLE AI AND STANDARD-SETTING

AI holds risks, and the technology has many unknowns and is in a period of exponential growth. Standards are being set but are struggling to keep pace. This standard-setting involves global, regional, and country initiatives. Some of this regulation sets out principles, some sets out new institutional responses in the form of monitoring bodies (like the UN's OEDT, 2025), and some is in the form of new legislation. Yet, how these initiatives will shape AI is unknown. Will they impact fast enough? Will AI companies outpace legislation and evade it? Or will they bake in ethics on their own initiative? Not because it is the right thing to do and regulation may soon require it, but because matters such as honouring creatives, ensuring AI is not used for harm, and alignment are conditions of commercial success. To better regulate AI we need to also reframe how we understand the risks of particular types of data such as, relating to populations and understand their relationship to each other. While our regulatory frameworks often understand regulation in terms of the rights that individuals have with respect to their own data, they often neglect the risks of population data. We return to this question in Chapter 16. As regards use of AI, standard setting is taking place at company level, international level, regional and country level, and promulgated by bodies concerned to set benchmarks for AI industries.

14.4.1 *AI Company Standards*

AI companies have forms of standards that they impose on themselves. Anthropic has made some of the boldest claims for the self-restraint. It has developed what it terms ‘Constitutional AI’ to help deal with questions such as:

How does a language model decide which questions it will engage with and which it deems inappropriate? Why will it encourage some actions and discourage others? What “values” might a language model have? (Anthropic, 2025)

Constitutional AI, for Anthropic, is an approach that gives LLMs values determined by a constitution establishing principles, rather than by large-scale human review feedback that has been the main way of correcting and retraining AI (for full account see Bai et al., 2022). Anthropic’s Principles are based on ‘a range of sources including the UN Declaration of Human Rights, trust and safety best practices, principles proposed by other AI research labs ..., an effort to capture non-western perspectives, and principles that we discovered work well via our early research’ (Anthropic, 2025, references omitted).

The constitutional approach is not just about support for principles. It has efficiency savings for Anthropic, as it enables automated review of AI in accordance with the principles, rather than large-scale human review producing what Anthropic call ‘scalable oversight’.

14.4.2 *International Standards*

AI standard-setting is being pursued by international and regional organizations. Often these standards both set out global standards for states to comply with and promote states to standard-set in line with international standards. Indeed, the UN AI for Good platform holds an annual AI Standards Summit to enable companies and organizations to exchange and learn from each other’s standards (AI for Good, 2025). Examples of AI Standards are found in the box below.

UN AI Standards and Institutions

- UN *Global Digital Compact* (UN ODET, [2024](#)), linked to UN Pact for the Future ([2024](#)).
- UN High Committee on Programmes (HLCP), *Principles for Responsible Use of AI in the UN System* (UN High Level Committee on Programmes, [2022](#))
- UN General Assembly Resolution on AI ([2025](#))
- UNESCO Recommendation on the Ethics of Artificial Intelligence (UNESCO, [2022](#))
- UN and Interpol, Responsible AI Innovation in Law Enforcement Toolkit and Principles for Responsible AI Innovation (AI-POL, [2025](#))

African Union Standards and Institutions (see further Unver, [2024](#))

- Continental Strategy on AI (AU, [2024a](#))
- Communiqué on the High Level Policy Dialogue (AU, [2025](#))
- AU High Level Panel on Emerging Technologies (AUDA-NEPAD, [2025](#))

EU AI Standards

- i. EU General Data Protection Regulation, Regulation 2016/679, 2016 (EU, [2016](#))
- ii. EU Artificial Intelligence Act 2025 (EU, [2025](#)).

OECD Standards

- OECD: AI Principles. (OECD, [2025b](#))

14.4.3 Industry AI Benchmarking

AI industry-type benchmarks are being produced on an ongoing basis, generating various ways of measuring AI models with respect to matters such as accuracy of AI, level of usage, environmental impact, or similar.

These benchmarks operate as standard-setting mechanisms, and as their reputation grows the companies creating AI models will be incentivised to reach higher benchmarks. See the box below for some examples.

LYMS Chatbot Arena Leaderboard (2025) (measuring end-user preferred models).

MMMU Leaderboard (Measuring Massive Multi-task Understanding) (MMMU, 2025; see also Hendrycks et al., 2021) (measuring performance of models).

GPQA (A Graduate Level Google-proof Q&A Benchmark). (Rein et al., 2023) (measuring quality of answers).

HHEM (Hughes Hallucination Human Evaluation Model (HHEM, 2025) (measuring hallucination rates).

The Institute of Electrical and Electronics Engineers (IEEE) Global Initiative on Ethics of Autonomous and Intelligent systems, Ethical Aligned Design guidance (see IEEE, 2018).

14.4.4 *Peacebuilding AI standards*

While multiple AI for good standards exist, and peacebuilders have been engaged in creating them, and while copious other PeaceTech-specific ethical standards exist (see e.g., Hirblinger et al., 2025), as yet there are few specific peacebuilding AI standards.

There are, however, some. The International Panel on the Information Environment have produced guidance on AI and Peacebuilding (2025). This guidance echoes the challenges and mitigations set out above. Build Up have produced a short blog setting out the types of considerations they think are important for peacebuilder use of Gen-AI. These focus on understanding AI as augmenting rather than substituting human peacebuilding, avoiding using AI in a way that it can become a ‘single point of failure’, and using human-centred design processes (Build Up, 2019). Our own project has also set out the similar AI Principles that inform our work (PeaceRep, 2025b).

14.5 CONCLUSION: FUTURING AI

It is difficult to anticipate where AI, and Gen-AI in particular, will go. It is therefore difficult to know where ‘Gen-AI for Peace’ will go (see Kokotajlo et al., 2025, for an interesting speculative future). The release in 2025 of ChatGPT 5 fell rather flat, and lowered expectations that AI would continue to improve exponentially (for evaluation, see Lee, 2025). Even the CEO of OpenAI responsible for ChatGPT, Sam Altman, talked of an ‘AI bubble’ and expressed doubts in the technology’s future trajectory (Jamali, 2025b). However, many AI and Gen-AI capacities already exist and are being used in the peacebuilding field. In the future the most routine uses of AI are likely to be for the most routine tasks, with Gen-AI being built into the bureaucracy of peacebuilding. Yet, new experiments with AI as a direct peacebuilding tool exist and are exciting. However, they pose new challenges and our existing governance frameworks need reworked to better serve peacebuilder needs. In addition to efforts to ensure that AI models work ‘for good’, there is a need to better address the types of population harm that AI use of data can enable. Peacebuilders require training to better understand AI risk, and in particular Gen-AI risks. These risks are often specific to specific technology uses, for example Gen-AI for image recognition, machine learning, and use of large language models, all have different risks requiring different forms of expertise to address.

I find that with AI, and in particular Gen-AI, there is a raciness that I feel caught up in myself, that both excites me and disturbs me. A bit like when you drink too much coffee and feel you can revolutionise your life and maybe the world in an hour but then wonder if that much coffee and way of thinking is actually good for you. Yet it may well turn out that Gen-AI is neither magic solution nor existential problem, but something that nonetheless significantly changes how peacebuilding practice develops.

Questions

1. Which challenges of AI worry you the most? How convinced are you by the mitigations?
2. At the end of this chapter are you an AI optimist or AI pessimist? Have your views changed in the course of thinking more about this issue?
3. What forms of AI do you see as ‘low hanging fruit’ for peacebuilders?
4. What AI skills do you think will be useful and even necessary to those engaged in local, national and global peacebuilding efforts?
5. What are the challenges of operationalizing AI effectively?
6. How should we calibrate possible AI trade-offs between conflict resolution and environmental protection?
7. What sort of ‘guard rails’ need to be in place for AI to be used for good to end wars?

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PART III

PeaceTech Challenges



PeaceTech Praxis

Abstract PeaceTech reports seldom describe the practical trials of mounting a project. Yet those who reflect on the field suggest that the transformative or disruptive potential of PeaceTech lies less in the simple use of technology and more in the curious and unpredictable ways that PeaceTech ‘doing’ modifies peacebuilding as a political practice. This chapter therefore offers lessons from doing, in part to help people ‘do’. However, the chapter also sets out a vision of PeaceTech as praxis, by thinking through what the necessary ingredients of that praxis are.

Keywords Failure · Innovation · End-users · Software choices · Digital capacity

15.1 LEARNING THROUGH DOING

When we began our work in the PeaceTech field, it was with a sense that everything was doable. It was a matter of bringing the right capacities to bear on the right problems.

Then, we discovered lots of challenges as described earlier. Getting things done seemed hard. It often took longer than we thought. We discovered lots of wonderful people and good practice, but we also encountered persistent challenges. Tech wizards offered us unlimited potential, and then started to hum and ha, and did not deliver. Businesses

that we assumed would cost, plan, and deliver work to clear specifications better than our informal in-university collaborations did not. They often wanted money up front, made no commitment to joint planning, and came back with outputs that only half worked. We encountered both innovative new start-ups that could not deliver what they promised and established businesses that somehow could not work in straightforward planning processes. (Of course, we also discovered lots of wonderful people and good practice!)

To be honest, it sometimes felt as if perhaps we were not ‘doing things right’. Our work risked all turning into experimentation without clear result. We seemed to have entered a business world of smoke, mirrors, and potentially unpredictable and therefore unmanageable costs.

Over time, we have reflected and talked to others in the digital transformation and PeaceTech fields, commissioned papers to inform our PeaceTech work, taken digital transformation courses, swapped notes with the most similar data projects, and watched some massive digital transformation failures in our own wider university environment. It seems the problems we encountered are in fact normal.

Many of these PeaceTech problems have been touched on in other chapters. However, it seems useful to future PeaceTech entrepreneurs to draw together lessons and choices.

15.2 WHY DIGITAL TRANSFORMATIONS FAIL

There are masses of business blogs, reports, and academic articles dedicated to ‘why digital transformations fail’. The lists that emerge are very similar, and interestingly, few reasons relate to the technology. Broadly, they include the following:

- **Transforming on the hoof.** Not having a clear vision of what you want to achieve in terms of sustainable business outcomes. Embarking on experimentation without defined goals.
- **Not being able to take the range of stakeholders on the journey.** Whether that is those who pay for things in the business, those who must engage with the technology in your own organization, or the end-users or ‘customers’ of the business. Leaving anyone behind spells failure.

- **Difficulty in appropriate staffing for projects.** Often teams must change, to add the right tech skills held by people you can talk to and understand, and who stay with the project long enough to understand the domain and give continuity of delivery. Projects need the right researchers, project managers, peacebuilders, and staff able to bridge between tech language and capacities on one hand and what ‘end-users want to do’ on the other.
- **Getting long-term funding and commitment to the digital transformation efforts.** Production will involve ‘invisible work’ that is costly in time and money, particularly at the beginning. Longer-term, you need to be able to sustain work, when the ‘shiny’ first iteration that the funder has already taken credit for is no longer good enough, or ‘new’ enough to attract further funding. Issues such as ‘servitization’, paying for subscriptions to software, mean that you may lose what you have created if you cannot keep up the subscription.
- **Not thinking tactically about technological tools** and capacities across the organization you work for, and the end-users you work with. The best tools are not always the best option. The tools that organizations already provide and staff are already using may be a good choice, even if they have limitations for your PeaceTech purposes.

In our particular ‘peace and conflict field’, we encountered similar challenges, in ways that were specific to the problems of that field. These often intersected with ethical and moral challenges, which will be dealt with next chapter.

You may encounter other problems, but what follows is an account of ‘what I wish I had known’.

15.3 WHEN TO DO SOMETHING

Let’s start with the positive: it is good to commit to innovation as part of peacebuilding research or practice. I have written this book because I am passionate about PeaceTech. I love the work, I love the potential of PeaceTech, and I love the community.

The key commitment that drives PeaceTech is a commitment to innovation in peacebuilding. Innovation works best when it responds to a problem. Understanding that there might be a technological solution,

however, also requires interest in exploring innovative ways to solve problems and time commitments to understand technological advances and what they offer.

I became committed to digital innovation that led to the PA-X Peace and Transition Process Data for the following quite simple reasons.

First, I have always been frustrated with how much we replicate data efforts in the peace and conflict field, without considering how to create better ways to sustain and combine existing data. As some of my stories illustrated, data initiatives sometimes move forward in overlapping ways in different organizations. Forms of replication can be useful, even if it looks a bit chaotic. However, I have always been convinced that as researchers and practitioners we can do much better in bringing data together in intelligent ways to better support practice.

Digital developments such as APIs, i-framing visualizations from one source into multiple websites and using collaborative tools such as Teams or Zoom now make it easier to cooperate and connect data across institutions, without people having to give up institutional ownership of data and products or even meet face-to-face. This is important because most data projects need ongoing institutional homes and support, meaning that ownership matters, while building a PeaceTech data infrastructure requires collaboration. Most big digital developments in the wider world, such as 3G to 4G to 5G mobile networks, and even the web itself, have come about not just due to better cabling, hardware, or software, but because protocols for sharing networks and collaboration and connectivity were created.

Second, conflict and capacities to mediate ends to it are indeed changing—for the worse. Given that diverse data now exists in good quality and can support what I have called ‘peace analytics’, it seemed useful to try to bring that data to bear on the types of agile and adaptive decision making that those seeking to end conflict must make to address multilevel conflicts that operate as a complex system.

Third, as our own data collection efforts grew and our PA-X Peace Agreement data was more widely used, we garnered a range of quite different ‘customers’ or end-users for our data. This drove further innovation because it seemed useful to develop a range of ways for different types of people to use the data. This innovation built the reach of the large-scale work we had already invested in.

Our drive to produce Peace and Transition Process Trackers and now to develop AI to make them more useable is tied up with these same

impulses. But the larger point is that the innovations all grew from a perceived need.

15.4 SHINY—BEWARE!

If you are a person who is attracted to digital innovation—as I am—there is a tremendous seduction about the digital world. There can seem to be a million racy projects and a boat that is leaving without you on it. Also, the potential seems really limitless. Everything can always go bigger and better, more comprehensive, and ever more multi-multi-functional.

I often thought that we could bring data together, or create visualizations or new technological ways of working, and then ‘see what we could do’ with it. Could we discover new things? Get new insights? Find a whole new way of working that revealed incredible new research findings?

But that does not work. It doesn’t work because in any digital or data innovation project, you make a lot of decisions that could be made in lots of different ways. It is impossible to make these decisions in any sort of consistent or coherent way, if you do not know why you are doing what you are doing.

This point may seem obvious. But there is something about the scale of potential tech solutions, and just how shiny they appear, that draws people into experimentation without purpose.

There may be reasons to experiment—if you are doing tech just to learn how to do tech, that is fine if you are honest about it, but even then, you will have learning outcomes to drive your decisions. I am also all for exploration as creative enterprise, and in fact we have used ‘visualization as exploration’ as a research methodology in our work (See Bell et al., 2022). But we still had a sense of ‘why’ that drove when we turned to experimentation.

If the why is clearly specified, it is worth also being somewhat agnostic as to whether tech is the answer. Rather than saying ‘I want to create an app to support peace agreement implementation’, it can be useful to be agnostic about the tool. ‘I want to support peace agreement implementation.’ This then involves a series of prior inquiries. What do we think amounts to peace agreement implementation? Where is it going wrong? What can be done about it?

At that point you can consider where technological solutions might solve particular problems such as: wouldn’t it be great if instead of people in field missions all going individually to the same sources to manually put

together very similar reports on ‘how things are going’, there could be a website that had this data in easy to ‘visualise and grab’ ways. Technical solutions will only ever be a *piece* of the solution.

15.5 SCOPE V USABILITY

We also discovered a trade-off between the scope of a PeaceTech application and its usability. The story of ‘doing one thing’ in the Covid Ceasefires Tracker and PeaceFem app stories of Chapter 9, reflects the advantages of limiting scope to one clear purpose. In Chapter 8, I examined PeaceTech Hacks—innovations that help with one task. These were indicated as one of the main ways PeaceTech applications have been developed and been useful.

Once-off applications often have the value of straightforward functionality. It can be quite tempting at a design stage to have your data or tech tool do all the things it could possibly do in fully customisable ways. But this often takes it beyond what most users will want to do simply. Your tool may end up being useable only by the ‘especially dedicated end-user’. And the timescales of production extend and extend. We often found levels of debate and constructive tension with our visualisers because we wanted to limit interactivity to a few features, rather than enable people to explore ‘everything’ from one interface.

Scope/usability trade-offs also exist with regards to data. In our Peace and Transition Process Tracker, which attempts to respond to double disruption, we started with the idea not to create the ‘ultimate tracker’ with all possible data and complex algorithms, such as CEWS attempt. The problem we were trying to address was the lack of usability of data for insights, and so we viewed the need to be less data, rather than more. The Tracker aims to provide better access and connectedness to the data people already use and trust, in ways that better connect to the questions peacebuilders are asking in a process. However, having developed it, our judgement is it is still too complicated to use, and we are working on Gen-AI solutions to simplify its use.

Doing one thing well, however, is not the same as ‘once-off’ PeaceTech design. The Ceasefire Tracker example came from a wider data collection effort that has a long hinterland and integrity. It repurposed data-interface design from the Amnesty database, and in turn has been repurposed for parts of our new Peace and Transition Process Tracker.

15.6 KNOW AND COLLABORATE WITH ‘END-USERS’

‘Know and collaborate with end-users’ is the peace-and-conflict-specific exhortation to ‘know your customer and bring them on the journey’. Peacebuilders and researchers often do not think of end-users as customers because we try not to have products to ‘sell’ and the culture of ‘partnership’ predominates, rhetorically at least. But, like a business, we want what we work on to be useful and used, and for this to happen PeaceTech innovations must add value to the peacebuilding world. Our funders also expect this and are second-level ‘customers’ who look at download figures and monitor and evaluate how well a PeaceTech innovation works and what value it has added (as compared to the money it cost). So, even not-for-profit PeaceTech experiments must respond to questions of ‘value’ and ‘usability’, and often there is not one clear ‘customer’ but a number of different stakeholders with different concepts of value.

We have already mentioned being specific about who you think the end-users are, and what they want to do. Different peacebuilders will have different needs and capacities to use technology. For example, international peacebuilders and local peacebuilders often have quite different agendas for change and ways of working and different levels of digital inclusion. The same tool might not work for both. Local organizations may have different capacities due to things such as the bandwidth available to them, access to a computer, etc. The PeaceFem app, for example, is targeted on a very specific audience of women peacemakers and mediators, in particular in the Middle East, and designed to be low bandwidth.

At the design moment, it can be useful to try to describe very specifically the end-user and task the application is intended to help. For example, ‘the end-user is the person who arrives in a country field-team without much warning and has better knowledge than the lay person but does not have the detail of the past peace process at their fingertips’. And Task: ‘this person wants to be able to quickly access past peace agreements and get a sense of the main issues they covered, with capacity to open the whole document easily if they want.’ Elaborating end user and task with specificity makes decision making easier.

15.7 MAKING GOOD TECH CHOICES

This looks like a different version of ‘shiny—beware’. But it is less an exhortation not to jump to tech solutions, than to make sure that the choice of tech is appropriate to the context and need. Remember PayPal’s advice: use technologies your customers already use. Making good choices requires asking, and even researching, what local tech people already use. Does it raise security issues that you need to think about more? What bandwidth is available in-country? Who has capacity to use what tech?

“If you have a hammer, everything looks like a nail.” This phrase captures the idea that often our use of digital tools is ‘supply-driven’ rather than ‘demand-driven’, in ways that lead us to perhaps do silly and even unhelpful things (like hit something inappropriate on the head). Given that peacebuilding itself is criticised for being too ‘supply-driven’, replicating this in PeaceTech is to be avoided.

Critical Choices: use existing tech tools or designing bespoke PeaceTech tools? We often faced choices relating to the tech tools we used. Sometimes the range of possible tools is overwhelming. We faced a question of whether to work with existing software and tools or design our own. Low code software (that does not require coding expertise), or using existing software creatively, can often make something quickly doable, sufficient to ‘get up and running’. It can be used by a range of staff without technical expertise and has often had a lot of time and thought go into making the output look good. It can be good value (or already on your computer) and efficient because you are using a tool rather than inventing one. But sometimes it is just not the right thing, and all the workarounds will become cumbersome.

For what it is worth, we have found that starting with low-code experiments, with software that you have skills to use, is a really good way to consider what you are trying to do and what is possible. Over time, you may need to customise or invent. As described with our Ceasefire Tracker, we used Knight Lab’s timeline tool initially in a no-code form. But when we wanted to design a bilingual timeline in both Arabic and English for Yemen, and those languages were read from right to left for the former, and left to right for the latter, we found it useful to design our own timeline (PA-X Analytics, [2025i](#)).

We have become less afraid to try to build our own customization when low-code tools start being restrictive. Sometimes this can mean jumping into the ‘coding’ version of a tool to modify it, and sometimes

it has meant creating our own coded tool or visualization completely. Creating our own tool or visualization also has the advantage that we can leave behind our code in an open-source way that is hopefully useful to others in the peacebuilding field, for example our Yemen timeline is enabled in both left-to-right English and right-to-left Arabic. We hope that this contributes to creating a new research capacity, as well as new research. But we started ‘low’, or even ‘no’, code.

15.8 BUILDING DIGITAL TEAM CAPACITY

A big obstacle lies in getting access to the right digital team. Team capacities are needed at three levels. First, ‘domain expert’ capacity in our case that knows the peacebuilding field, how conflict works, and the relevant data. Second, the right ‘technical expert’ capacities to deliver what you think will respond.

Third, are an important middle set of people: ‘creative integrators’ to think about how to connect the problem and any proposed tech solution, who can bridge the ‘domain expert/technical expert divide’ (see Fig. 15.1). Often these integrators will have to be people who are domain experts but have some digital leadership dimension. We have been lucky on our team to have such people, and we have also worked to expand existing staff skills and think about the skills we need as we work. For smaller organizations, what I have called ‘PeaceTech enablers’, such as Build Up, may be vital partners to act as this connective tissue, while transferring skills to peacebuilding organizations.

Specific skills are needed for the integrators who connect domain and tech experts. It is important that integrators can write a technical specification that addresses the peacebuilding need. It is also important that they can supervise the team to test prototypes and translate modifications into further clear specifications for improvement.

In the peacebuilding field, however, teams will often have to include not one individual in each of Fig. 15.1’s bubbles but also cohere the diverse types of expert within each bubble. Teams may need a range of domain experts: peacebuilder practitioner skills, peace-and-conflict researcher skills, conflict-and-peace data knowledge and skills, local knowledge experts. Over time you may also need a larger range of technical skills than the term ‘tech expert’ suggests: development operations staff who can install your data on a large-scale computer, or who can provide access to that large-scale computer or data storage facility,

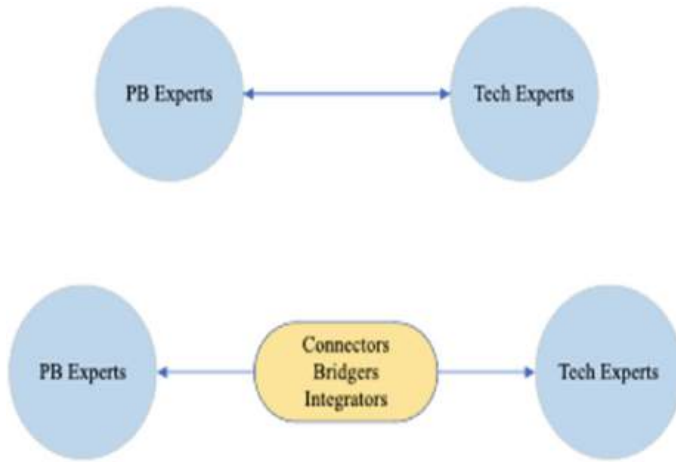


Fig. 15.1 Connecting expertise

data engineers, database designers and visualizers, and security advisors capable of evaluating whether the cyber security offered is sufficient in your conflict context and risks (see Fig. 15.2). How do you access this expertise?

Critical Choices: in-house or out-house expertise? There is a choice here between whether **to stay in-house, or go ‘out’**, in terms of how you build access to the right team. That is, do you recruit someone onto your team with skills or build up the skills of an existing team member, or ‘contract out’ support to a partner, consultant, or company? The choice will be shaped by budget, as well as human resource and contracting matters. However, beyond those constraints, for us it often felt quite difficult to know which choice was ‘best’.

We worked flexibly doing what seemed best in the moment, while also glancing down the road. Both in-house and out-house experts were useful at different times. More important was whether we could create good working relationships with in-house or out-house colleagues to enable ‘iterative design’ and ongoing processes of collaboration. We find we are never just ‘commissioning’ a piece of technical work but rather need to engage in co-creation across tech and subject-matter experts. We need a commitment from technical experts to that process. We can get this from relationships with business providers, but it does not work for us to fit

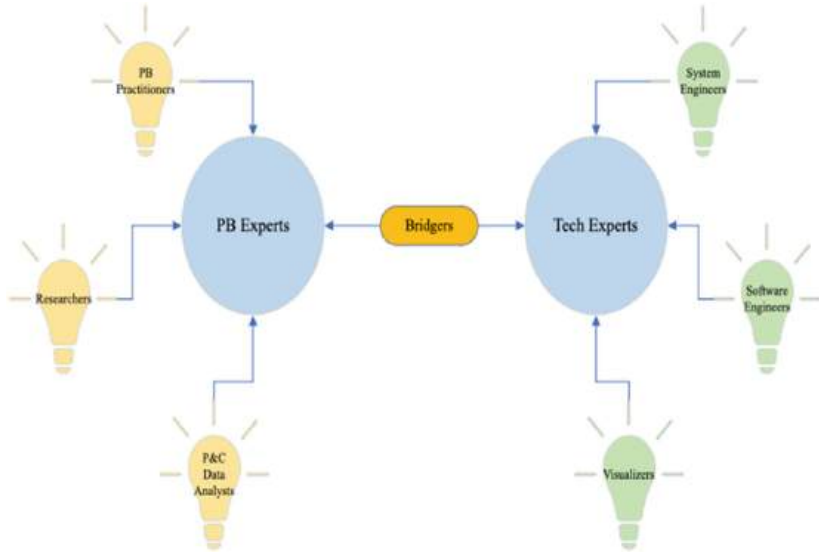


Fig. 15.2 Expert clusters

within traditional business models of either ‘buying a job’, or ‘servitization’. What seems easier to contract for, than to ‘do’ oneself, often is not. More on that later.

In all peacebuilding-expert to tech-expert relationships, the most important ingredient is capacity to communicate across very different languages and expertise. It may sound obvious, but sometimes digital innovation seems to involve taking things on trust as too technical to be explained in simple terms. I now tend to assume that if the technical experts cannot explain to me what they are doing using language and concepts I can understand, or commit to a joint design process, the project is not going to work. Similarly, if I or my team do not commit to learn how to talk and understand the language of our technical experts, then again: the project is not going to work.

15.9 SUSTAINABILITY IN ALL DECISIONS

So many PeaceTech initiatives have not been sustainable, although interesting pockets of innovation may have been usefully incubated on the journey. If you value your project as having some durability, it is important to think about sustainability from a number of angles.

Think in advance about what is logical to sustain. Some innovations will be discrete and have logical endpoints from their start: e.g., the ‘Ceasefires in a time of COVID-19’ app clearly was going to involve time-limited data. In others, we have had to consider: will this project be useless if we cannot find funding to keep generating the data it needs, due to funding or time restrictions?

Sometimes the answer is ‘no’. The PeaceFem app decision to focus on ‘significant’ examples, rather than all examples, was in part a sustainability choice, because it means the app remains useful and valid, even if every new gender provision is not added.

Work within frameworks that are not disproportionately costly. If you have created something that you want to sustain, you need to think how it will be paid for into the future. Ambitions of scale need to be tempered. Or sometimes, you can use digital innovations to do some tasks at lower cost in sustainable ways, and these innovations become part of the initiative. Questions of cost also involve thinking about the tech relationships you get into before committing to them in ways that are difficult to switch from.

Engage with ‘servitization’. I am not sure what the answer is, but servitization is a problem for sustainability. For tech providers, it is often their business model. Where you want to purchase a piece of work, providers will want to create a service relationship. However, if you end up with multiple service relationships you will have multiple rolling costs, which can suddenly add up to amounts that stop the project from being sustainable.

It can also be difficult to be sure about what exactly the ‘service’ bit of servitization provides. There can be hidden costs. We talked to related databases about whether they did their database design and storage in-house or not. Unlike us, their database designers were external providers. The business charged for ongoing storage and all that goes with that. However, the company often announced they had discovered security risks in their system and produced additional bills for fixing them. Our

colleagues complained—‘it sometimes feels like they break a window and then charge us to fix it.’ I know the feeling.

Entering a servitization model makes co-creation and iterative design very difficult. You may need to talk all that through and negotiate a different way of working, or build relationships with tech providers that somehow work around these models. As regards emergent PeaceTech providers, funders often want to see a plan for sustainability based on the PeaceTech paying its own way, which usually requires a ‘servitization’ model. This can stand in tension with the funder’s desire to have the tech produced ‘for public good’. Pushing servitization can perpetuate a business model that stalls rather than enables iterative development. It can also mean innovative PeaceTech entrepreneurs are pushed to provide a static ‘do a thing’ business model, rather than pursue cooperative creative journeys that are more open-ended. Yet, ongoing sustainability needs to be paid for.

Environmental Sustainability. With all digital activity there are environmental costs, and we touched particularly on the environmental challenges of AI. Some sort of environmental cost-benefit analysis needs to be undertaken. Zoom meetings may save international flights, but they still have an environmental cost, including even the minerals used for gadgets, or the electricity and water they cost to produce. AI costs are catastrophically large. All natural resource issues, as well as being environmental challenges, drive violent conflict somewhere in the world. A tendency to assume that efficiency and removal of travel means that there is a net environmental ‘win’ now has to be re-calculated with Gen-AI entering the picture and being built into nearly every digital tool we use.

15.10 DESIGN TO FUTURE-PROOF

There are three main aspects to futureproofing.

Thinking ahead. Sustainability can also be addressed by thinking ahead about the things you will need to change and commissioning the work to not just deliver the end product, but to also deliver easy ways for the product to be customised or extended in the future, as we did with the languages on PeaceFem app.

Design for re-use. We have often designed data interfaces not just for the immediate use, but in ways that enable the back-end design to be modified so that we can ‘re-purpose and reuse’ what has been developed

to completely new uses. An example was the repurposing of the Amnesty interface for the COVID-19 Ceasefire Tracker.

Document as you go along. We always documented what we were doing, but now I would document even more. Documenting experiences creates capacity for new staff to pick up the work, but also for the learning to be shared and used more widely. Documentation can ensure PeaceTech efforts and capacities do not disappear. It should cover the nuts and bolts of how the tool and underlying system works, what servers it is on, and what relationships are needed to sustain use, the code used, the passwords, the decisions made, etc. Documentation should be ‘internal’ for new staff to pick up and know what is going on. Documentation should also have an external form—sharing learnings and processes and even code with others. We are now working hard on this. This book is itself a documentation and lesson-sharing effort. We are also working to visualise our process of data creation, for improved transparency to improve trust.

15.11 RETURNING DATA AND FEEDBACK LOOPS

There are issues with where data comes from and where it goes to, which we will discuss more next chapter. However, worth noting for now: it is important to have people ‘participate’ in, use, and learn from their own data. Their participation can itself be measured or evaluated, and the feedback it provides is itself data that tells us something interesting.

The whole of PA-X was in ways an attempt to pull a peace agreement repository together and return it to the people in-country who worked on those peace processes, and also to others engaging in future peace processes. We now also work with local researchers to collect data on whether peace is being delivered. This data is collected in surveys from people in-country to compare data on ‘how a peace process is going’ to people’s perceptions in-country, so we can identify where to ‘mind the gap’ (see e.g., Deng et al., 2022). How, then, can this data be used by the communities that were its source?

Is returning data to those it was drawn from a business need or an ethical commitment? If you are serious about peacebuilding support, I would say it is both.

15.12 LEARN FROM THE LOCAL

Peacebuilding innovation is nearly always at its most innovative when responsive to conflict at the local level. This is no less true of PeaceTech. We have found that commissioning work or elements of work in-country is nearly always possible, and adds considerably to the tech's utility, even if it is then more difficult to achieve quickly. Butterfly Works' partnership with Yemeni designers to produce the Felix Arabia games stands as testament to this approach and adds the value of local jobs to the digital product, rather than being extractive.

15.13 RISKS

In addition to the above considerations, you will have to think carefully about the possible consequences of what you are doing in terms of ethics, harm, risk, and safety. These all need be specifically evaluated project-by-project. There are well-established processes of managing ethics, data protection, and risk of harm to people, and perhaps peace processes themselves. However, as we explore further next chapter, the established processes are sometimes inadequate to the types of risk and harm that digital tools can cause. Often it is important to call in two types of expert knowledge: expert local knowledge as to how risks may play out, and expert tech knowledge regarding how to handle issues such as digital security.

15.14 COMPLEX PRAXIS ISSUES

Think about what you are doing 'really?' In addition to risk and ethical considerations, a praxis approach to PeaceTech requires also thinking about 'what you are doing *really?*' What does this even mean? It is an exhortation to remain aware of the criticisms of PeaceTech and issues such as 'double disruption' and always question—what am I doing? Or perhaps—what practice of production am I engaged in? This reflexivity involves being aware of 'modularization', 'servitization', and WarTech-PeaceTech nesting—all quite complicated things. It requires self-reflection on the ways one is engaging with the digital transition. Are you replicating problematic practices, are there consequences you should be worried about? Are you becoming part of a wider war-tech ecosystem,

or enabling companies for whom wartech is the main objective? I address this type of ‘technomoral’ reflexivity further next chapter.

15.15 CONCLUSION

Throughout this book I have presented PeaceTech as a ‘praxis’, combining both knowledge production and theory with practice. This account of how to ‘do PeaceTech’ shows the complexity of the praxis approach, as it brings together not just theory and practice, but different types of theory and different types of practice, for example:

- The theory of peace and conflict experts as to how to de-escalate or end conflict.
- PeaceTech practitioners who have capacity to use new technologies.
- The theory of informatics experts, for example, as to what type of visualization best communicates and engages the user, and to what end.
- The practice of creative visualization or prompt engineering.
- The theory of what data and statistical techniques are the most accurate.
- The theories of change of peacebuilders and understanding of the practices they wish to engage in.
- Theories of how the digital transformation is reshaping global power-relations and war itself.

Theory can inform practice, and critical reflection on that practice can then inform theory in an ongoing loop. As this loop continues, it informs questions such as: when does PeaceTech add value, transform, or distort peacebuilding practices? When does it align or misalign with peacebuilding values? This type of approach to PeaceTech design means that all design contributes to a wider PeaceTech knowledge and builds ecosystem relationships.

Questions

1. What challenges do these lessons raise for ‘getting started’, or doing PeaceTech as a small local group?

2. Is there something about digital innovation that causes us to think that normal ways of working are not to be applied? Which of the lessons apply to any project management, and what is distinctive to digital innovation in peacebuilding?
3. How important do you think ‘iterative design’ is? Is it always important?
4. Do these lessons affect any PeaceTech ideas or plans you have?

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Ethics, Risk, and Technomorals

Abstract PeaceTech raises distinctive ethical, risk, and moral concerns. These arise due to risks inherent in specific digital technologies, as well as risks relating to their use in conflict contexts. This chapter outlines the ethical, risk, and moral issues that arise. It points to the gaps in existing ethical frameworks and considers how they are being filled.

Keywords Ethics · Risk · Do no harm · Data protection · Corporate social responsibility · Technomorality

16.1 PEACE/WAR TECH INTERFACES

In her book *First Platoon*, prize-winning journalist Annie Jacobsen tells the following story from the conflict in Afghanistan (2021). I summarise for my purposes, but she tells it better. It is worth reading in full.

Kevin is working for the US Army in Afghanistan prior to US withdrawal, as an expert in ‘pattern-of-life’ analytics, an experimental form of behavioural science. He monitors behaviour of suspected Taliban members, using an array of cameras attached to a giant tethered balloon, monitored from a remote bunker. He has spent time watching and analysing the daily habits of a man wearing a purple hat, who is being tracked as part of an attempt to warn US platoons of impending attack.

This man has been identified as a ‘bomb emplacer’ who buries improvised explosive devices (IEDs) for the Taliban. If someone is identified as in the process of placing IEDs, according to Army rules of engagement that person can be targeted and legally killed. All the information from Kevin, from the balloons, and from other sources are fed into a Palantir knowledge foundry system (remember Chapter 10), where it is supposedly crunched with a range of other data. This system is used to identify people and make decisions about legitimate targeting of suspects, but permission to access it is above Kevin’s paygrade, so someone else reviews all the evidence and makes the targeting decision.

One day, Kevin is told that the man with the purple hat is in an act of emplacement and about to be killed. Kevin looks at the image feed as the strike is being put in place. What he sees does not match the close personal study he has made of this man and his habits. While the computer algorithm has identified that, ‘this is the man’, Kevin doubts it and persuades his superiors to abort the strike.

Kevin was right; the target was a civilian farmer in a field.

16.2 UNPICKING ETHICAL CONCERNS

In the story, Kevin’s human analysis was more accurate than Palantir’s machine-supported deductions. Jacobsen shows that lack of transparency regarding how the knowledge foundry works means it is impossible to understand why the targeting ‘went wrong’. Indeed, it is likely that those relying on the foundry did not understand entirely how it worked, and it is possible that neither did Palantir entirely. A form of AI will have determined whether the suspect was a target, and many different coders will have worked on the AI.

Jacobson’s book is eye-opening in showing just how far WarTech has developed, and everything she describes has developed apace since the book was published. She focuses on the use of personal and biometric data in Afghanistan, including iris scans, fingerprints, photographs, occupation, home addresses, and names of relatives.

This data was used to track Taliban fighters, as Jacobsen describes. However, personal biometric data was also used in Afghanistan as part of GovTech to try to address corruption—for example, the payment of ‘ghost soldiers’ as in people who did not exist being paid salaries in a form of corruption. The existence of ghost soldiers has been blamed as one of the reasons why an army of supposedly 300,000 fell so quickly

to the Taliban once the United States and allies pulled out in August 2021. It seems that many of the 300,000 did not exist (see BBC, 2021). Interestingly, another theory for the quick fall of the Afghan army is that extensive Taliban disinformation circulated as part of a highly sophisticated social media campaign as to how many cities it had ‘taken’ led to many army units surrendering because they felt the battle was already lost.

In a further twist to the tale, when the United States, United Kingdom, and other NATO countries withdrew from Afghanistan in 2021, they left behind GovTech biometric data without securing it. After the Taliban returned to power, it appeared that they found ways to use this data to identify and kill former government workers who they perceived as enemy (Human Rights Watch, 2022). In other words, the systems used as GovTech to enable civiness became used by enemies of civiness to target and kill, and at this point data exposed whole populations of people, rather than just individuals. Afghanistan illustrates graphically the ways in which projects ‘for good’ become intertwined with war efforts in complex and unpredictable ways.

Also worth noting—the story opens a window into the fragmentation of conflict and peace and how they intertwine with the digital transition that I have labelled ‘double disruption’. The internationally constructed transition that took place over a twenty-year period in Afghanistan (2001–2021) produced conflict fragmentation and overlayed transitions over time. The entire process was then terminated by an agreement signed in 2020 not between Afghans, but between the Taliban and the United States (Afghanistan, 2020) for US withdrawal, collapsing the previous peace strategy, and paving the way for the GovTech data to be appropriated by the Taliban and used against Afghanistan’s civilian population, and in particular women.

Against this ‘double disruption’ backdrop to peacebuilding, how can we begin to think about the ethical challenges for PeaceTech and consider what frameworks and regulations exist to govern them?

16.3 ETHICAL, RISK, AND MORAL CONCERNS

Trying to intervene politically to stop wars raises distinct ethical, data protection, risk, and harm issues as compared to other contexts. When new technologies are thrown into the mix, even more complex issues are raised. The issues are legion and often very specific to the digital innovation in question, as has been touched on in each chapter. Rather than

dive into technology-specific detail, I will point more broadly to existing frameworks, their gaps, and how they are beginning to be filled.

There are three quite different sets of ethical questions to be considered in any PeaceTech project that I use to structure this discussion.

Ethical concerns. The first set of concerns focus on ensuring that PeaceTech is not inadvertently supporting non-peaceful activities that can hurt people: that PeaceTech cannot be ‘flipped’ to WarTech. These concerns are common to all peacebuilding interventions and legal and ethical frameworks exist to manage them. However, PeaceTech digital innovation poses additional challenges that these frameworks do not adequately cover.

Design Process Concerns. The second set of concerns focus on questions of the ethics of the design process involved in PeaceTech. The search for ethical PeaceTech design process is driven by a wider set of ethical commitments to particular forms of practice that peacebuilders understand to go hand-in-hand with the type of peaceful outcomes that they are trying to achieve. This practice includes commitments to equitable partnership between Global North and South, fostering greater inclusion of civilians, mitigating climate impacts, and using practices that support rather than undermine social justice. Ethical and good practice frameworks addressed at PeaceTech are starting to elaborate this form of process ethics but remain scattered.

Technomoral Concerns. A third set of concerns, which we can label ‘technomoral’ concerns, operate to try to deal with the ‘what are we doing *really*’ questions that I have asked at points in the book. Technomoral concerns focus on how digital innovation shapes our lives and world in ways that relate to human flourishing and create or destroy a world we might want to live in (Vallor, 2016). We have very few systems for guiding technomoral approaches to PeaceTech into practice.

We will now examine these three types of concern in more detail.

16.4 IMPACT CONCERNS: ETHICS, HARM, AND DATA PROTECTION

The first set of concerns attempt to ensure that PeaceTech does not harm people. Ethical concerns are common to all research and peacebuilding enterprises, but use of PeaceTech poses five distinctive challenges for how we identify and manage risk of harm. All have been illustrated by stories throughout this book.

- **Geo-located population data.** Digital technologies, from AI algorithms to satellite imagery, often produce detailed geo-located population-specific data that poses risks to groups because conflict often involves targeting groups. In a conflict context, it raises a need to evaluate PeaceTech plans in terms of whether and how geo-located data could be used to target vulnerable groups of people. Our current ethical and data protection frameworks, however, only ask questions about the potential risks to individuals and tend to approach legal regulation in terms of individual rights, rather than population relationships.
- **Cyber security risks.** Any digital innovation needs awareness of cybersecurity risk to be able to fully evaluate the risks to individuals and populations. Using digital tools responsibly in conflict contexts requires more than concern about individual consent and privacy issues. It involves being aware of understanding where data is stored, pre-identifying risks such as from hacking or cyber-attack and putting in place mitigation strategies that may themselves need digital fixes, such as forms of online security (UN OCHA, 2016).
- **Information as intelligence.** Digital technologies such as satellite or other aerial technology, even when used for peace research and peacebuilding, produce forms of knowledge that have a value as ‘intelligence’. They come close to the knowledge that intelligence agencies gather, with consequences for unpredictable spillovers from PeaceTech to WarTech.
- **User-misunderstanding risks.** Digital technology risks are not always well understood by all those on the multi-disciplinary teams using them, or the ethical committees reviewing research methods. As we have seen in earlier chapters, AI can become ‘misaligned’ and hallucinate, satellite photos can be misinterpreted by AI or by humans, and data can be crunched in data foundries without understanding the quirks of the data collection. Digital surveys can be conducted remotely by researchers who may then be less aware of the risks to individuals being surveyed. Ethical review panels will not always have members who are sufficiently knowledgeable as to whether risks are being appropriately anticipated and mitigated.
- **Risks to processes of public good.** Peace processes are themselves vital objects of peacebuilding and civicness. Digital innovation can damage them. This damage has consequences for the long-term

levels of violence and trajectory of the conflict, but again is not a type of risk that standard ethical frameworks ask about.

In universities, frameworks and processes exist to manage ethical concerns through ethics approval systems, data protection frameworks, and risk management matrices. These types of frameworks also exist in business organizations and non-governmental organizations that inhabit the PeaceTech ecosystem. However, how robust the framework is, whether it involves independent review, and whether reviewers have any digital or conflict context-specific expertise, will vary between different types of organization in the PeaceTech ecosystem, and often is also dependent on their size. Further, as Hirblinger and colleagues note, risk responsibility is often cascaded ‘from international organizations to local actors, from public sector to private sector and civil society organizations, and from organizations to end users’. Cascading leaves those with least resources and capacity to deal with them in a process he labels ‘decentred dereliction’ (Hirblinger et al., 2025).

In countries experiencing conflict, relevant legal and policy frameworks may not exist. Afghanistan, for example, had and still has no data protection law. This does not mean that frameworks do not need to be applied. In the United States, United Kingdom, and European Union, for example, data protection is backed up by legislation and tends to apply to research projects ‘abroad’ because it focuses on where data is held and processed which is usually ‘at home’. Where there are legal loopholes, organizations may also choose to apply relevant frameworks as institutional good practice.

Let us look at a few of the relevant types of framework in general terms, to understand how they deal, and do not deal, with the above PeaceTech challenges.

16.4.1 Ethical and Data Protection Frameworks

University researchers have to apply for ethical approval, which involves reviewing issues of ethics and risk. They also file data protection plans for research collecting data. These processes will be governed by organizational policy and by law, and often also by the terms of funder grants or contracts.

Ethics. Relevant ethical frameworks are modelled at heart on medical ethics frameworks and a model more appropriate to something like drug

testing. Standard ethical frameworks focus on whether there is an anticipated harm to individual research subjects and whether it has been adequately dealt with. The forms typically ask whether the person has given free and prior informed consent to be a ‘research subject’, and whether they have been made adequately aware of risks that the researcher understands to exist and been given capacity to withdraw at any time. Typically, the forms also ask about potential risks to researchers from conducting the research. Some risks can be mitigated, and all risks must be balanced against the value of the research. Some risks are very high and cannot be mitigated, and then research cannot take place.

Data Protection. Universities and some peacebuilding organizations will have similar rules and procedures for data protection. These frameworks are also individual-focused, driven by the idea of an individual having privacy rights with respect to their own data, with consent as the basis for its use by others. Data protection requirements rise the more that ‘personal data’ such as name, address, race, and gender is recorded and used. Data protection involves tying permission to use data to an evaluation of what information is strictly needed for the research.

PeaceTech Gaps. As regards PeaceTech innovation in conflict contexts, these frameworks and procedures leave clear gaps. Most critical is what the UN Office for the Coordination of Humanitarian Affairs (OCHA), calls data relating to the ‘time and place-specific activities of affected populations’ that is, ‘spatiotemporal metadata’ (UN OCHA, 2016, p. 3). Ethical and data protection policies, forms, and processes focus on individuals and sometimes do not prompt researchers to consider whether population-specific risks such as those created by PeaceTech methods and data and should be addressed.

Group-based data in conflicts is highly political. In Bosnia, at one point during the conflict in the 1990s, there was graffiti saying, ‘every Yugoslav war started with a referendum.’ Referendums used to ascertain a population’s wishes for who should have sovereignty or where borders should lie could also be used as geo-located targeting maps for those who wanted to create ethnically ‘pure’ areas that would enable borders to be re-drawn and future referendums to be won. Time- and place-specific population data regarding the activities, identities, or political views of particular populations has a WarTech value. In practice, most peacebuilders are acutely aware of the controversy of group-based spatial

data in the contexts they work in. However, there is no protection framework for these concerns within many of the key institutions supporting PeaceTech, unless those undertaking the work create and use them.

Second, there is no specific framework for considering whether and how cyber-risks have been evaluated, and whether sufficient research has taken place to understand what they might be in a conflict zone characterised by cyberwarfare.

Third, ethical and data protection processes often have little context-specific expertise to offer the question of how data might be misused in the conflict in question. If those involved do not alert to the right risks, those reviewing, certainly in universities, are unlikely to have country or conflict expertise at all.

Consider, for example, satellite data as described in Chapter 11. It seldom focuses on individuals and therefore will not need consent according to standard practice. Yet this data contains population specific data that is high risk for populations. As noted, satellite data is now sufficiently low-cost or open-access to be used by researchers and non-governmental organizations who may have little contextual knowledge or capacity to anticipate how the data might be used by local actors (remember Owen from Chapter 1). Users may also be insufficiently expert in the type of data or technology to understand its possible flaws and misrepresentations (remember Kevin's story at the start of this chapter). The ethical processes involved may not ask about these issues or deal with them if the researcher does not know to raise them.

The Harvard Humanitarian Initiative (HHI) (2025) has usefully shared its experience, which is rather like Owen's (see further UN OCHA, 2016). HHI joined the Sentinel Project to use satellite imagery to monitor the border region of Sudan and South Sudan to detect threats to the civilian population. They reported on troops massing or moving, and what looked like possible attacks on civilian housing and possible mass graves. The satellite imagery provided access to areas that otherwise could not have been monitored, and while precautions were taken on how images were released (for example editing out landmarks and coordinates), HHI concluded over time that:

the impact of the collection of imagery and the release of reports on many different types of actors, on the ground and at the international level, became increasingly consequential yet unpredictable. Thus HHI could no longer assess the potential risk the project was exacerbating, not could

it causally determine when it either mitigated threats or magnified them. (UN OCHA, 2016, p. 10)

Whew!

Having assessed that it simply could not act responsibly on the project, HHI acted responsibly by leaving the partnership. Instead, it focused on researching what a good framework of common operational doctrines and ethical standards to address these issues might be (UN OCHA, 2016, p. 10).

Beyond satellite data, other data such as social media data, and even news data, can also connect groups of people with place and time, depending on how it is used. Interestingly, Viljoen (2021) argues that we need to move away from regulating data protection in terms of individual rights over data, towards understanding that most of the wrongs coming from use of data flow from its use in organizing and understanding how groups of people relate to each other. She argues that it is the population-level information that data provides that gives it economic value. She suggests moving away from current regulatory approaches of asking what the individual's rights over individual data should be, in what she terms is a 'data as an individual medium' (DIM) approach to regulation. Rather we should create forms of regulation that understand 'data as a democratic medium' (DDM). Viewing data as a democratic medium involves regulation that protects data as a public good with implications for the shaping of power-relations in society. DDM approaches distinguish between uses of data to further the public good and uses that damage the public good, rather than focusing on 'what' data is used. Viljoen's critique of DIM and proposal of a DDM approach has value in the peacebuilding context as it responds to the dangers of population data and its misuse in conflict contexts. The difficulty is, conflict contexts are characterised by dispute over whether democracy is an accepted mode of governance, and so the impetus for a DDM approach to data regulation will need to come from a wider global democratic commitment that is currently lacking.

16.4.2 *Research or Intelligence?*

Information collected by peacebuilders or researchers, such as the satellite images HHI used, can provide not just data, but a form of 'intelligence'. Again, we have no frameworks to enable us to draw a clear line as to what makes something a 'research methodology' and what makes

it ‘intelligence’, and ethical review processes do not prompt researchers to evaluate when a use may cross the line from research to intelligence. Little guidance exists on how to assess the ethical or conflict impact of how information may be used. All research providing ‘data’ can be used for all sorts of purposes. But use of open-source imagery has an immediate currency in conflicts as illustrated by Owen’s story and the HHI project, which means its intelligence-related risks just feel different. Heather Marquette suggests that some protection from toppling from research into intelligence-gathering is given by simple application of rigorous research standards. These include:

- specifying the research purpose of using satellite imagery
- justifying its use, adhering to research ethics principles such as anonymity
- openness regarding the use of the images in the research
- educating people about how to interpret the images

But she also calls for honesty that even research rigor will not protect against intentional use of data as intelligence and points out that this will typically happen without the researcher or peacebuilder’s knowledge (XCEPT, 2022).

The problem, however, is broader than satellite imagery use. The risks apply to to all ‘open source intelligence’ (OSINT), as in the process of gathering and analysing all publicly available information to answer questions, assess threats, and make responsive decisions. The digital transformation has created OSINT on a scale hitherto unimagined, and crucially, like satellites, it provides information about populations and their relationship to each other, while current approaches to data regulation start with a focus on how individuals are affected (see further Viljoen, 2021).

16.4.3 *Cyber War Risks*

The application of ethical and data protection standards to digital innovation in conflict zones is further complicated by the heightened cyber security risks of many contemporary conflicts. Cyber insecurity in conflict zones is often of a different nature and scale and quality than in other places. It cannot be accounted for by quickly racking one’s brains and

asking, ‘are there any risks?’ while filling in a form. Cyber-risk needs to be researched in context to understand the consequences of even non-personalised data collection.

In Yemen, for example, internet provision is itself a key ‘front’ in the conflict—so much so that any quick explanation of how internet control is affected by the conflict is not possible here (for more detail, see Combs, 2020). Suffice it to say, the Houthis, a key armed actor involved in the conflict, and the current fractured government of Yemen, which is tied up with Saudia Arabia and the United Arab Emirates who are also involved in the conflict, have two different internets. YemenNet is controlled by Houthis, and AdenNet was set up using another ISP by the United Arab Emirates and Saudi Arabia to break Houthi control. These have different geographic coverage and operate different forms of censorship. This type of cyber complexity means that something as simple as encouraging people to communicate through computer, and which internet provider they use (something that is easily remotely discoverable), can give a sense of location and possible political affiliation. Plus, both internet providers can monitor all individual online activity. Knowledge of the realities of internet provision, censorship, and capacity to monitor is clearly relevant to a range of PeaceTech methodologies. Without an audit of how the internet works, including how it is controlled, key insecurities and risks will be missed.

A whole lot of things that we think of as fairly safe or having non-physical consequences in relatively peaceful societies can be subject to a different level of consequence in conflict countries. For example, WhatsApp groups that can easily be hacked and people targeted for views; use of X/Twitter that can be monitored at scale; a ‘self-learning environment’ computer that falls under the control of local armed leaders. To evaluate these risks requires expert knowledge of context and in particular the digital context.

16.4.4 *Dual Use Restrictions*

There are other forms of ethical framework that seem more appropriate to address the war-peace entanglement of PeaceTech. Dual-use frameworks in research ask researchers: ‘does your research have a military application?’. If one answers ‘yes’, the research cannot be undertaken under normal grant frameworks, for example those of the European Union. Yet again, however, the framework does not seem appropriate for PeaceTech

applications. The challenges of double disruption and ‘modularization’ means that almost any PeaceTech digital innovation aimed at making peacebuilding more effective can also be unscrewed and attached to war to make war more effective. Nearly all digital devices used to gather information are dual use in a broad sense.

Dual-use frameworks tend to focus on the intent of the technology, or try to list particularly problematic technologies, or both, rather than focus on whether a technology is *actually* dual-use, precisely because of how broad the category of ‘dual-use’ can be. The question is whether this is an adequate approach.

For example, the European Research Council’s (ERC) Frontiers grant requires a declaration to the following effect: ‘We declare that the proposal has an exclusive focus on civil applications (activities intended to be used in military application or aiming to serve military purposes cannot be funded)’ (see for example, ERC, 2025). Therefore, whether something such as a software application is dual use seems dependent on the user’s intent, rather than the possibility of actual dual use.

There are, however, other dimensions to the ERC policy, including guidance for researchers and a link from this research policy to a legal framework for export licences to help elaborate dual use. However, on closer examination, these provide list systems that require that particular types of military-related hardware always require a licence as always potentially dual use, while public software can be presumed to not require licences. This approach may be appropriate for a grant of export licences because the policy focuses on trying to make sure obviously dangerous goods do not invisibly cross borders. However, the policy is not designed to guide questions of how digital research methodologies designed for non-military purposes could be considered to raise a risk of dual use in practice in ways that need considered and mitigated. Working groups continue to try to work out a better research framework (see for example, Bromley & Gerharz, 2019). Paradoxically, however, the issue is now potentially being resolved by a move to explicitly permit dual-use applications more freely, because there is a pressure within Europe to angle research more towards ‘defence’ (Greenacre, 2025).

16.4.5 Risk to Peace Processes: Too Much Knowing

PeaceTech entrepreneurs working to support mediation processes to end wars might be concerned not just about harm to individuals, but about

harms to the peace processes they are aiming to support. Our current formalised standards within the research environment do not raise this question as relevant to ethical or data protection concerns. But should they?

What if even good data harms a perfectly good peace process, damaging the prospects for a negotiated end to the conflict? As I grew up in Northern Ireland, it was heartbreaking when secret peace talks were revealed before they had a chance to produce any real compromise and parties who did not want to be seen to be compromising all jumped away from the process. Decades of conflict and death often followed.

If we seek to undertake PeaceTech to support wars ending, should we think in terms not just of a duty of care towards research subjects (people) and geo-located populations, but also a duty of care towards peace processes? Or is that too political?

Investigative journalism and public transparency are good things. But where a sensitive process is in play and holds the prospect of life or death, should that process be protected from things like ‘publicity’ or ‘transparency’ at key moments? Secrecy might be particularly important where digital communication now makes it more difficult to achieve. Discussion with local political leaders in several contexts points to the dangers of ‘too much knowing’ because of having to justify minutiae of who has met with who, and discussed what, and why? Often armed actors need space away from the public gaze to explore politically unthinkable moves.

Do we just trust our broader ethical standards as sufficient, and require people to protect their peace processes in other ways—for example, by building public buy-in for the idea of political compromise as having a value? Or is there sometimes ‘too much knowing’?

16.4.6 Do No Harm Frameworks

Humanitarian actors have what seems a more appropriate framework for harm to processes than that of ethics or data protection. That is the ‘do no harm’ framework. This framework also has its roots in medicine and the Hippocratic Oath. In the humanitarian world, it is understood as a framework to help apply the seven fundamental principles of humanitarianism: humanity, impartiality, neutrality, independence, voluntary service, unity, and universality. ‘Do no harm’ evaluations aim to support questions of what these values mean when applied to a particular proposed intervention. ‘Do no harm’ involves asking not just about risk to people, but

about unintended harm to institutions and processes. Harm could include how emergency healthcare might affect a national healthcare system down the road, or how food aid might impact on the livelihoods of local farmers. Do-no-harm frameworks in essence critically question the range of short- and long-term consequences that could flow from trying to ‘do good’ (see e.g., ICRC, 2015).

Yet, there are problems with adopting ‘do no harm’ in practice. It is difficult to calibrate and compare risks of very different types of harm. When engaging with something politically complex like a peace process, outcomes are unpredictable and a matter of relative risk. When should that stop immediate intervention to end conflict and how would we calibrate the risks of doing something, versus the risks of doing nothing? It is always easier to do nothing, because that has no risk, right?

People living in conflict seldom do nothing. They work around and through the conflict; they create ‘normal lives’ in the midst of abnormality. They take incredible risks to travel through war zones to possible safety, or to build peace, or fight for justice. They risk their political capital to call a ceasefire and take a chance of something different. They experiment with how to make connections or create new ways of doing things. They do all this because they do not have the luxury of doing nothing. Sometimes that carries the biggest risk of all. Yet, people in conflict understand their own context, and have standing to make what are in-essence political and personal decisions. External researchers and peacebuilders do not and must try to manage risk of harm another way.

With all its faults, applying a ‘do no harm’ approach to PeaceTech design is useful in prompting consideration of issues of harm that go beyond immediate harm to people as covered by ethical frameworks, to consider also further political consequences. Asking how one can ‘do no harm’ at least prompts useful deliberation on what the range of harms and benefits might be, which can inform how things move forward. Our current ethical review processes when applied to PeaceTech could usefully ask for a ‘do no harm’ evaluation that is broader than harm to individuals.

16.5 PROCESS CONCERNS: ETHICAL DESIGN

Our second set of ethical questions relate to ethical design. That is, whether the ethics of the methods match the ethics of the outcome. The issues have also been touched on throughout, and the main ones can just be outlined.

Inclusion. Peacebuilding at many levels is about inclusion, and inclusion has been a major challenge and concern regarding peace processes, as UN Security Council Resolution 1325 bears witness to. Legal challenges have been made to peace agreements and the constitutions that result due to the exclusion of non-dominant minorities by peace process power-sharing or devolution deals (see e.g., *Grand Chamber, European Court of Human Rights, Sejdić and Finci v. Bosnia and Herzegovina*, 2009). Digital innovation, as we have seen, is often justified as increasing inclusion. Yet digital inclusion itself is a challenge in fragile and conflict settings.

For example, women often have much less access to mobile phones than men. Rural peripheral communities where minorities may reside can lack internet access or mobile connectivity at all. As we have seen in the Yemen example, divided governments with different areas of control using tactics of cyberwarfare and censorship can create conflict-related biases in provision of digital connectivity. Further, we may simply not know what the conflict-relevant biases of technology and its uses are without a strong baseline evaluation that may be beyond the scope of most projects.

Other problems can be created by PeaceTech, such as uneven inclusion. Women in many conflict areas will face cultural and safety barriers and additional costs to travel, for example, being required to be accompanied by a male family member. Digital access to peace talks post-COVID has occasionally seen men participate in person and women facilitated remotely. Yet these are quite different forms of access.

All these factors can mean PeaceTech's offer of improved inclusion can come with more hidden exclusions. The biases of who has access to technology can damage the peacebuilding outcome, or the peace process itself, particularly in a context already full of exclusions, distrust, and disinformation. Use of PeaceTech therefore needs to involve a prior audit of digital inclusion and steps to account for or remedy bias, often through supplementary analogue processes.

Environmental Protection. PeaceTech offers ways of cutting down environmental impact, such as using online meetings rather than in-person ones involving travel. Data, however, has energy needs that are significant—for example in the large data warehouses behind the Cloud, or energy-guzzling AI data centres. Thousands of small satellites create space debris. AI consumes vast amounts of energy and water, which can even affect national supplies of both, while most computer, data and phone hardware use rare minerals that are often located in conflict

countries. The environmental impact of PeaceTech, and the connection to conflict itself, is not always easy to unearth and quantify against its environmental and conflict savings.

Corporate Social Responsibility (CSR). Most large-scale businesses have adopted some form of corporate social responsibility standards that commit them to reviewing their own practices on issues such as inclusion and diversity and environmental impact (see generally Posner, 2024). PeaceTech entrepreneurs can therefore choose partners carefully in this regard. However, it is more difficult to unpick and assess the multiple relationships that digital providers are involved in, all with different commitments to social responsibility, as illustrated by the Planet Labs-SpaceX partnership in Chapter 11.

Furthermore, the secrecy surrounding some proprietary technology of PeaceTech providers can preclude understanding what firewalls are in place between different customer uses, as Conall's story illustrated last chapter. In 2019, for example, Palantir, the company in the Afghanistan story at the start of this chapter, was engaged by the UN's World Food Programme (a Nobel Peace Prize winner in 2020), at a cost of \$45 million, with potential to improve alleviation of hunger, but their involvement raised serious concerns about data protection of millions of the world's most vulnerable people (Parker, 2019).

Good practice for the use and design of digital technologies in peace processes requires that frameworks for assessing, avoiding, or mitigating the above concerns continue to be developed and applied.

16.6 TECHNOMORAL PRINCIPLES

Throughout this book, I have often stumbled into questions of 'what are we doing *really*', when we engage with PeaceTech?' What do I mean by this? The question captures my underlying feeling that there can be an uneasy relationship between the means of PeaceTech and the ends of peacebuilding, which even revised ethical and risk assessments do not quite 'get at'.

Shannon Vallor (2016) responds to this unease, suggesting that when engaging with transformative technologies, we should ask: are we using digital technology in ways that will lead to humans flourishing because it creates a world worth living in? Ethical frameworks ask: 'what are we doing with the technology, and are we doing it safely?' In contrast, what

Valor labels ‘technomoral’ frameworks ask: ‘what is the technology doing to *us*, as humans, as a society’?

Should PeaceTech providers think about this question, and how? Throughout the book there have been hints of persistent concerns with PeaceTech practices that seem more relevant to technomorality than simple ethics and risk questions.

North-South empowerment and equity. How should supply and demand relate to digital innovation, and where it occurs? Digital innovation clearly should not always come from the Global North to add ‘hacks’ to peacebuilding interventions undertaken in the Global South. PeaceTech efforts to develop digital innovation responsively seek to avoid supply-driven PeaceTech. However, digital innovation does not happen ‘in one place’. How then should we evaluate equity and participation in the underlying structural capacity for PeaceTech, for example, as to where data warehouses, fabrication, and innovation have their infrastructure located? What does technomorality require—would replication of data warehouses in the Global South be a good thing? Or working to limit data centres in the Global North? Or using existing capacity in better service of Global South inclusion? Technomorality asks us to consider these questions as part of the peacebuilding project.

Morality of relationships, knowability, and distance. Multiple instances of PeaceTech are about engaging bigger populations through remote engagement. Is this a good thing? Even if we could factor out disinformation or the inequities of who remote engagement reaches? How does remote participation restructure relationships of trust focused on ‘knowing’ as an exchange of information, rather than a process of ‘getting to know’?

What if remote access enables international actors to work ever-more remotely? There are gains of efficiency, capacity, and even perhaps local ownership. Or is there a technomoral principle of ‘being present’? Seán, whose story opened Chapter 1, does not exist, and if he had existed, he would have been working ‘in-country’. But similar people were at pains to tell me that most ‘Seáns’ are knowing and uncomfortable with the inadequacies of their ‘presence’. As local expertise illustrates, a micro-knowledge is gained invisibly through every movement through a street, every interaction at a marketplace, and through the interpersonal relationships of friendship and co-working. It is even gained in every ride in a taxi, when taken between UN buildings, and everything observed through darkened windows.

Peacebuilding's 'Uncanny Valley'. AI brings accentuated difficulties of 'knowing' particularly where it invites relationships with AI rather than real people. The examples of an AI agent to simulate a refugee or armed actor, and the use of AI to 'help knowing' country contexts through AI-assisted surveying, examined in Chapter 13, pose the question of what or who we come to know through these modes of working.

Albrecht's avatar project presented a Sudanese woman and man with American accents. Does that matter? What if we changed the race of the avatars? Would that be permissible or not authentic? What is authentic? What does it mean for a human to be drawn into an interaction with an avatar refugee? We know from other contexts that people form real relationships with AI avatars and even ChatGPT. We know very little about whether the human-avatar relationship improves empathy with similarly placed people or not. Sudan is also a conflict with wholesale sexual violence as a tool of war. How should a refugee or armed actor avatar answer to questions about sexual violence? Who should they be allowed to answer questions to?

The term 'uncanny valley' has come to describe the uneasy feeling one gets when encountering something that seems as if it is human but is not, such as an avatar or robot. Peacebuilding has its own uncanny valleys. A clash of reality and unreality already characterises the relationship between international compound and country beyond. Deeper embedding of AI into bureaucratic tasks could make this into a truly uncanny valley, as Seán feared in Chapter 13. The uncanny valley feeling I suggest, is itself a moment of technomoral crisis without easy resolution.

From Corporate Social Responsibility (CSR) to Cultivating Technomoral Virtues? And should we be concerned, beyond CSR, about how the providers of PeaceTech are creating the wider digital transformation world? Some of the personal views of key providers of AI seem completely at odds with notions of 'civiness', with no commitment to inclusion, moderation of hate speech, or even democratic elections. Should the view of the CEO affect when and how peacebuilders use the product? The question is not straightforward, but one which technomorality requires us to ask. There is a need to ask not just 'is this company engaged in providing something I like?', but also 'is this company creating a world I like'?

To be clear, technomorality is not a matter of judging the moral worth of tech entrepreneurs or their companies. It is a matter of considering one's own moral stance with reference to the social reality being

created. Asking: ‘is this a world I want to participate in building? Or do I need to also engage with how to build it differently?’ Pro-social design entrepreneurs and many other PeaceTech efforts we have seen engage both with the peacebuilding project, and with how to design tools in ways that also align with peacebuilding morals.

I suggest that developing technomoral PeaceTech is necessary to building a praxis that does not merely connect questions of conflict resolution theory with the PeaceTech practice, but also connects that practice to theories of how digital technologies are reshaping our world in ways that also undermine the very civicness that peacebuilders are trying to enable (cf. Tellidis & Barker, 2025).

16.7 EMERGENT STANDARDS USEFUL TO PEACETECH

New ethical and even technomoral standards are emerging to address the concerns raised in this chapter and the last one. We have encountered many technology-specific ethical and risk standards throughout the book, and some of the standards that are emerging specifically with reference to PeaceTech. One difficulty is that there are so many different sets of standards and they are emerging and being developed so constantly. It can be quite a task to try to synthesise them all and use them to guide action.

We have found the following useful, so I offer them as examples of baseline approaches to technomorality.

FAIR Principles. The UN advocates and aims to comply with the use of FAIR Principles for Scientific Data Management and Stewardship for generation and use of data, and capture many of the lessons I have shared (GOFAIR, 2025). They elaborate a framework for ensuring that data is accessible, interoperable, and reusable. I also find OCHA guidance on data management very practical and useful in providing both standards and process advice, for data-driven projects in conflict contexts (UN OCHA, 2016).

PeaceTech-specific standards. Standards are also emerging from within the PeaceTech ecosystem to offer PeaceTech-specific guidance relevant to technomoral challenges.

A collective of organizations, for example, have established principles for digital development (Principles for Peace, 2025) that are intended to guide good digital development, as part of an ongoing commitment to establish good practice frameworks. The Principles resonate strongly

with our learned experience of what constitutes good practice articulated earlier. They focus on how to build processes that establish the right types of relationship, rather than evaluating just uses of data for harm. Build Up is also working to address ‘current ethical challenges’ (2025c) and plan further development of PeaceTech guidance.

ConnexUS (2025a), of which Build Up is a part, has set out frameworks which go much more to the underlying technomoral issues. A Peace Impact Framework (ConnexUS, 2025b), for example, tries to go beyond ‘do no harm’ to suggest the type of iterative cooperative practice that might be useful to doing good, based on three pillars: lived experience; aligned measures; and shared reflection. These principles in essence try to build civiness as a practice of PeaceTech, rather than just concentrate on avoiding harm. ConnexUS also are piloting a ‘grounded accountability’ (GAM) model (ConnexUS, 2025c) using Everyday Peace Indicators to create more community-driven ways of monitoring and evaluating peace outcomes. While not focused on digital innovation, this model offers a way to approach data ownership, feedback loops, and equitable partnership in PeaceTech applications.

Guides are also emerging with relation to PeaceTech methodologies supporting peace mediation. The UN Department of Mediation has set out Guidelines on Digital Mediation in the form of a Toolkit, mentioned earlier (UN DPPA & CHD, 2019, 2025). UN DPPA and Swiss Peace have also set out a practical framework for using social media in mediation (UN DPPA & Swiss Peace, 2021).

These efforts are weaving good practice standards around PeaceTech in ways that are thoughtful about the challenges in peace processes. They are tailored to help navigate these challenges.

Yet, a central difficulty remains of how to keep pace with digital innovation. Sullivan (2022), for example, argues that we live in a world where we simply cannot regulate to keep up with digital transformation because ‘how the tech works’ constantly outpaces our ability to design effective ethical frameworks capable of constraining its use. His ideas suggest that the value of new frameworks may lie less in providing static ‘regulation’, and more in providing institutions and processes for addressing ethical questions that create assemblages of people who entangle in ethical deliberative practice across the PeaceTech ecosystem. This ecosystem, as we have seen, has very different types of actors with very different ethical commitments. Sullivan argues that in place of a traditional approach to regulation, it may be helpful to approach regulation as a process of

bringing together different ecosystem actors to ask how knowledge and relationships, empowerment and disempowerment, are being defined and co-created, and to produce a response. Sullivan's shift-shaping approach to ethical regulation resonates with a shift-shaping digital conflict world because it grapples with the difficulty of regulating fast-changing digital practices. His approach can be argued to move beyond moments of ethical review, towards forms of ongoing convening and brokering to solve constantly evolving ethical problems. This approach in a sense builds-in a form of technomoral commitment to ongoing resolution of ethical dilemmas. Yet I also feel uneasy as to whether ongoing convening and brokering to ensure ethical compliance between people whose values and power are not aligned will provide the same restraint as clear-cut ethical review focused on whether digital practices are undermining human flourishing.

16.8 CONCLUSION

Thinking back to the idea of Peacebuilding ripples, set out in Chapter 2, and the idea that at heart peacebuilding is a practice of building civicness, it becomes clear that impact ethics, process ethics, addressing risk, and building in technomorality are deeply connected. Key mechanisms of peacebuilding, such as creating trust, are often also its ends. It is therefore difficult to separate moral questions as to modes of tech production from using tech to achieve peacebuilding ends. As Audre Lorde put it, '[t]he master's tools will never dismantle the master's house' (Lorde, 1984). Her phrase captures how practices such as using legal standards to deliver equality need to be pursued while simultaneously attempting to reform those legal practices. Peacebuilders and others are rapidly developing ethical standards for all of the above challenges.

As regards PeaceTech, supporting civicness means not just using tech to support civic action, but embedding civicness as an ethic of PeaceTech production. 'Doing PeaceTech' requires being part of a community that develops ethical strategies and ethically designed tech, as much as ethical frameworks. Those involved should work to develop a practice of behaving ethically, legally, inclusively, equitably, environmentally, and technomorally.

Got that? Right.

Questions

1. How concerned are you about the peculiar ethical, data protection, and technomoral challenges of PeaceTech?
2. Which ethical, risk, and technomoral concerns particularly worry you?
3. How confident are you that we can design better ethical, data protection, and technomoral frameworks to deal with them?
4. Is there a risk that overthinking leads to inaction, a harm which we seldom evaluate?

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PeaceTech Futures

Abstract This chapter assesses ‘where PeaceTech’ sits in terms of hype, disillusionment, and a plateau of steady-state use. The chapter’s purpose is to anticipate and provoke debate as to what is ‘fad’ and what is likely to be transformative for peacebuilding. The aim is to provoke a conversation as to where PeaceTech is ‘at’.

Keywords Gartner Hype Cycle

17.1 A PEACE TECH HYPE-CYCLE AUDIT

PeaceTech is growing as an area of interest to peacebuilders, peace and conflict researchers, and businesses. So how should we engage with the hype? The Gartner Hype Cycle (2025) was produced by Gartner (2025) to assist clients in thinking about when to adopt new technologies (see Fenn, 2022 for an account of its origins). It involves a graphic representation of the maturity-to-adoption lifecycle of new technologies and innovations divided into five phases. While its real-world accuracy can be challenged, it provides a useful framework for thinking about where the various PeaceTech technologies are ‘at’. I set out the Gartner Hype-cycle modified to evaluate PeaceTech in the box below.

Gartner Hype Cycle

1. **Innovation Trigger.** Interest in a PeaceTech possibility is sparked by seeing an application of a new digital innovation.
2. **Peak of Inflated Expectations.** People's excitement and expectations for the innovation exceed the reality of its current capacity to deliver. This can include considerable financial speculative support.
3. **Trough of Disillusionment.** Peacebuilder and funder excitement dissipates and is offset by disillusionment due to poor performance, length of time to deliver, or lack of sustainability in cost-outcome terms.
4. **Slope of Enlightenment.** Early PeaceTech adopters overcome the initial hurdles and begin to realise the innovation's benefits. Other organizations benefit from the experience and gain better knowledge regarding where and how the innovation will deliver significant value (and where it will not).
5. **Plateau of Productivity.** The PeaceTech innovation demonstrates real-world benefits, and more organizations feel comfortable with the greatly reduced level of risk. Others adopt the PeaceTech innovation until the innovation (modified or not) becomes mainstream.

PeaceTech as a whole is perhaps currently riding up the curve of the Gartner Hype Cycle. However, throughout the book we have explored very different technologies and PeaceTech uses that are at very different stages of the lifecycle. Where then would we plot each of the key transformative technologies of PeaceTech? I offer a speculative Gartner Hype Cycle graph below (Fig. 17.1). What follows is my assessment of where each PeaceTech technology is 'at'. I offer it for deliberation and provocation, rather than as a final judgment that I persuade you to accept.

17.2 PEACE TECH AS HACK

The PeaceTech ecosystem, and perhaps the nature of peacebuilding itself as a practice of experimentally responding to the onset of conflict, seems predisposed to produce digital hacks. While many of PeaceTech's 'one-offs' have not been sustained, I nonetheless place digital hacking of

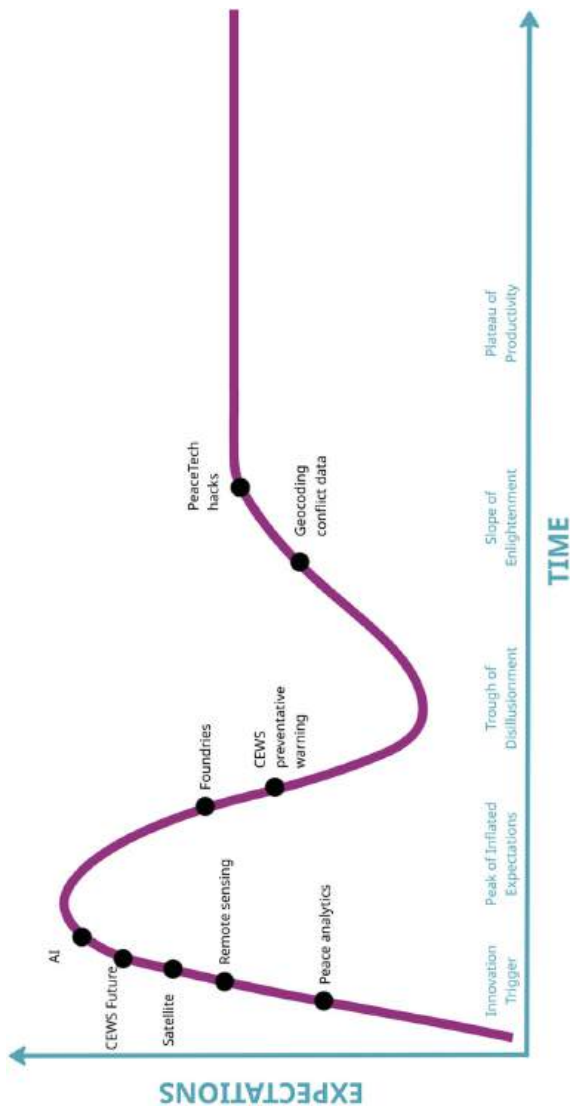


Fig. 17.1 'PeaceTech' Gartner Hype Cycle

peacebuilding as a practice in the Plateau of Productivity. Across the peacebuilding field there is a sustained turn to technology and methodological innovation that seems destined to grow. Discrete initiatives have opened minds as to digital innovation and generated a new ever-expanding ecosystem that enables new forms of collaboration across actor-type, and across skills.

Ad hoc digital peacebuilding is therefore ‘mainstreamed’, but characterised by ongoing experimentation, rather than being en route to some sort of wholesale digital transformation of peace processes. Once-off experimentation is in part due to the ad hoc nature of peacebuilding itself, which was always not very ‘joined up’ across interventions, actions, and actors (see e.g., Whitfield, 2012). Peace processes are seldom able to mobilize strong cross-organization strategies or coordination, but often see vast amounts of replication, competition, and supply-led practice. PeaceTech as ‘hack’ at worst reinforces this pattern, although there may be something said for planting a thousand flowers to bloom. PeaceTech at least offers peacebuilding new techniques, efficiencies, and replicability.

Many peacebuilding organizations routinely use readily accessible digital technologies that are low-cost and are open to embracing ever more complex tech-innovations on a ‘trial-and-error’ basis. They increasingly work in partnership with PeaceTech enablers or even tech companies. Over time, some PeaceTech providers have found ways to build business models based on enabling a tool’s ‘reusability’ across a range of peacebuilding needs, and expanding the digital tools for organizations to draw on, as the Ushahidi example illustrated. There are of course vast gaps in who does PeaceTech and where it can be done, but these do not challenge the broad reality that digital methods are now firmly part of the new ‘go to’ in the peacebuilder toolkit.

17.3 CONFLICT EARLY WARNING SYSTEMS

CEWS remain a central focus of international attention, and are likely to remain so, not least because they are also big tech business. Today, they are a normal part of security intelligence systems. As regards their use in peacebuilding and PeaceTech World, I divide them into ‘predicting conflict onset’ CEWS, ‘nowcasting’ CEWS, and the more future-scanning-future-policy-oriented CEWS, and put these in slightly different places on the Hype Cycle graph.

Predicting conflict onset. Personally, I am sceptical about capacity to ‘predict’ the onset of violent conflict through purely quantitative data-driven methods in ways that mobilise effective pre-emptive responses to conflict. Some of the world’s most violent entrenched conflict in recent years did not trigger warning until conflict was imminent or had even started. We do not of course know exactly what the world’s intelligence agencies predicted, or the diplomatic initiatives that were mounted and failed. However, we do know that the conflicts in Ukraine, Myanmar, Sudan, and Israel/Palestine were not prevented. These conflicts appeared to take international organizations almost by surprise, with little evidence of anything other than last-minute attempts to avert, if at all.

In my view, understanding of conflict drivers and how they interact shows a mix of structural cause and human agency as responsible. Structural causes are difficult to measure and fashion into reliable prediction. Human agency is inherently unpredictable. The idea that probabilistic statistical modelling would provide political actors with the confidence to intervene and compel pre-emptive action appears to me to be misplaced. I suspect that behind data, good context-specific political analysis and forms of human intelligence, rather than data-driven analysis, will continue to be the main driver of response. But of course, I could be wrong and may have leapt too early into the trough of despondency. However, because I am there myself, I place CEWS as a data-driven automated warning, into the trough of despondency.

Now-casting. In contrast, CEWS that provide very immediate information to civilian populations, such as Hala Systems in Syria, as to when violent events are coming ‘right now’ seem to have a clear value and capacity to link warning to action. As conflicts continue, short term predictions are helpful to civilian populations struggling to stay safe, to move, to mobilise humanitarian relief, and to seek to influence the international diplomatic community and even armies. I also suspect that newer attempts to predict diffusion of conflict may prove reliable and useful. Understanding and predicting conflict diffusion has not just a ‘get out of the way’ use but allows more structural counter de-escalation initiatives to be mounted.

Future thinking. When we turn to the peace process ‘peace agreement implementation’ area of work, in my view CEWS and even PEWS have a value.

The capacity to address three challenges will be critical to how CEWS develop in ways that support better analysis as to future action. First,

whether platform design can move from provision of data to ‘actionable insight’ advice, something that Gen-AI may be helpful with. Second, whether platforms can avoid introducing so much data that they are too complicated to support meaningful deliberation on future strategies. Third, whether human data collection can be kept manageable and not suck up staff time at the expense of improving analysis.

CEWS and PEWS can be used as a support-mechanism for ‘future scenario planning’, to support the range of people involved in implementing peace processes to brainstorm how best to do so. CEWS for future-scanning avoids some of its warning-response gap problems, because rather than give a predictive analysis of what will happen next, it suggests emergent risks and creates a conversation as to whether a mission or country-team or set of local actors should ‘adapt’ what they are doing to address that risk. The UN’s CPAS, attempts to do this for UN peacekeeping. Our Peace Process Tracker also aims to support this type of deliberation across peace process implementers of different types. I can see futures-oriented CEWS and PEWS reaching the plateau of productivity if the right choices are made.

17.4 GIS, SPACE-BASED, AND REMOTE SENSING TECHNOLOGIES

Technologies once beyond peacebuilding budgets and expertise, such as satellites, now offer new capacities to peacebuilders. This technology also involves things like drones that we might think of as WarTech, now reinvented as a module to be added to peace technology. I suggest that GIS PeaceTech has had the innovation trigger pulled and is hurtling up the curve of inflated expectations. As a PeaceTech tool in-the-making, satellites and drones seem to offer peacebuilders and other peace process implementers such as peacekeeping forces amazing new possibilities. UN Peacekeeping appears to have seized with gusto the potential for new capacities for ‘intelligence’ to support peace implementation.

Whether GIS develops to support peace processes will depend on ongoing open-source, low-cost provision of new satellite capacity, and peacebuilders being able to access sufficient resources and expertise to use it. Connectors such as Earth Blox-type projects that offer ‘low- or no-code’ ways of accessing and using planetary images may play a part. However, my jury is out on how mainstream this type of work will become for peacebuilders.

Perhaps the biggest limitation of aerial observation for PeaceTech lies in the ethical civilian protection issues encountered by HHI (Chapter 11), in which early warning cannot be separated from what may be military responses. Can remote sensing technology be used as a module that can be unscrewed from war ends, and re-attached to peace ones? Peacebuilders may find it is impossible to build organizational firewalls to stop ‘intelligence for peace’ becoming ‘intelligence for war’. Capacity to move beyond a trough of despondency to steady-state use will involve adequately addressing challenges of capacity, expertise, and ethics.

17.5 GEOCODING

Geocoding of conflict and peace data, in my opinion, has reached a plateau of productivity due in no small part to the good practices of ACLED and UCDP and the wide usage of both these violent event data sources. Further standardization of things like administrative sub-unit geocoding, and visualization methodologies of plotting zones and relationships, geeky as that may sound, would be very useful for peace process monitoring. Better capacity to understand ‘the local’ spatially would enable conflict data to be linked with local peace perception surveys, such as those we have been conducting (Deng et al., 2022).

The remaining issues for geocoded data are the existence of data gaps and whether and how people trust data such as on deaths in conflict as providing a ‘real’ picture. The existence of multiple different conflict event datasets enables questions to be asked as to whether what the data seems to show ‘is real’ or an ‘artefact of the data collection model’. Some interesting in-country projects provide locally collected data to compare with the larger global datasets. Seeing patterns across different methodologies for counting creates a form of trust. There is a lesson for funders here: sometimes more is more, and replication has a value. Rather than pushing for harmonization, it is better to understand why and how datasets are different, and how they might supplement each other.

The other key gap is a methodological and data gap in understanding how to measure ‘peace impacts’, usefully contributed to by Caplan (2021). Using peace impact data for response-insight is often difficult, as peace impact data can involve ‘slow data’ and has country and quality gaps. It is often also difficult to disaggregate national data to produce local-level data in conflicts that are increasingly fragmented and uneven across the country. In the peace process context, there is a need to better

think through what types of change are relevant to measure, and what should be the expected timescales and necessary geographies of change, before jumping into complex data-integration.

17.6 PEACE ANALYTICS

In my view, there exists a clear capacity and need to bring together the very considerable data collection efforts relating to conflict and peace into better articulation for ‘peace analytics’. For this reason, we have focused PA-X Peace and Transition Process data to this end. Peace analytics will not change the world, but at present, as the stories right at the start indicated, multiple organizations repeat the same tasks to write similar reports, using the same data, in ways that they cannot share, to try to support peace processes. They face the same silly obstacles. How can I disaggregate the data by the local administrative districts we have projects in? How can I easily visualise information in a way that supports strategic decision making and adaptive management? How can I communicate levels of confidence about what the data tells us and what it does not? How can I connect the quantitative data to our own organizational assessments? These are all issues that if solved could support peace process implementation tasks and create massive efficiencies across organizations in-country (see e.g., Brusset et al., [2022](#), for an excellent report that bears similarity to Conall’s story). If done in an open-source way, as we are trying to do, the enterprise might also enable collaborative conversations between people who work with data platforms that cannot be shared for diplomatic reasons, because it would enable a common frame of reference.

I am biased, of course, as this is what we are doing. I also would not like to try to shoot us up the ‘inflated expectations’ curve but rather jump over it and the associated trough of despondency, to land in a place of productivity. I acknowledge that our peace analytics ‘is what it is’—an attempt (still ambitious we feel), to create new ways of seeing, new ways of sharing information and analysis, and new ways of making comparative process information available. Whatever its ambition, it is what happens next in the real world that will change that world or not. However, here AI has a yet untapped potential to push the field beyond data analytics towards suggesting ‘actionable insights’, as many new initiatives, including our own, are exploring.

I believe these types of platforms, and the methodologies we are working with, have potential to increase the opportunity for the priorities

of local actors to be more easily incorporated into peace process development, and seen and heard. Projects like Everyday Peace Indicators are good examples of how giving voice to local definitions of peace can have power even in high places like the World Bank. Giving voice to local priorities is perhaps even more important in a context of double disruption, where international actors no longer know ‘what to do’, are floundering, and are often displaced overnight from the country altogether, as the cases of Afghanistan, Gaza, Myanmar, and Sudan again illustrate.

17.7 ARTIFICIAL INTELLIGENCE

If I were trying to place AI on the Gartner Hype Cycle, I would send it out of orbit, as flying off the Gartner scale (see Fig. 17.2). As pointed out in Chapter 13, AI has been around and been integrated into many of the above technologies for a long time. However, the current hype around AI has been triggered mainly by Gen-AI, which is creating a form of digital revolution within a digital revolution.

AI is being integrated into an ever-bigger range of areas. The ‘SomethingTechs’ are now almost disappearing in a context where ongoing digital transformation itself is entering a form of ‘steady state’ characterised by ongoing disruptive developments at ever faster pace. AI companies are springing up promising ever simpler ways to ‘integrate’ AI into business practices. Existing companies fall over themselves to advertise that their platform is ‘AI-enabled’. Already-established businesses are both scared not to be early-uptakers of AI and to consequently lose out, and at the same time, are fearful about moving to AI adoption too fast. The FinTech shopping-credit company Klarna, for example, laid off masses of staff as it moved ahead of the field to use AI chatbots for customer service, only to find out that customers were not convinced and to quickly re-hire them again (Haun, 2025). Although this story masks that Klarna still ended up with AI transforming its business model.

Yet, as we examined in Chapters 13 and 14, it is quite hard to evaluate whether AI is worth the hype, how bad the trough of despondency will be, and what steady-state will look like. In the peacebuilding field, as in other areas, much depends on whether the current issues with AI can be dealt with.

Peacebuilders have caught the AI bug. Several innovative experiments are popping up, from Didi’s attempt to predict a ripe moment for

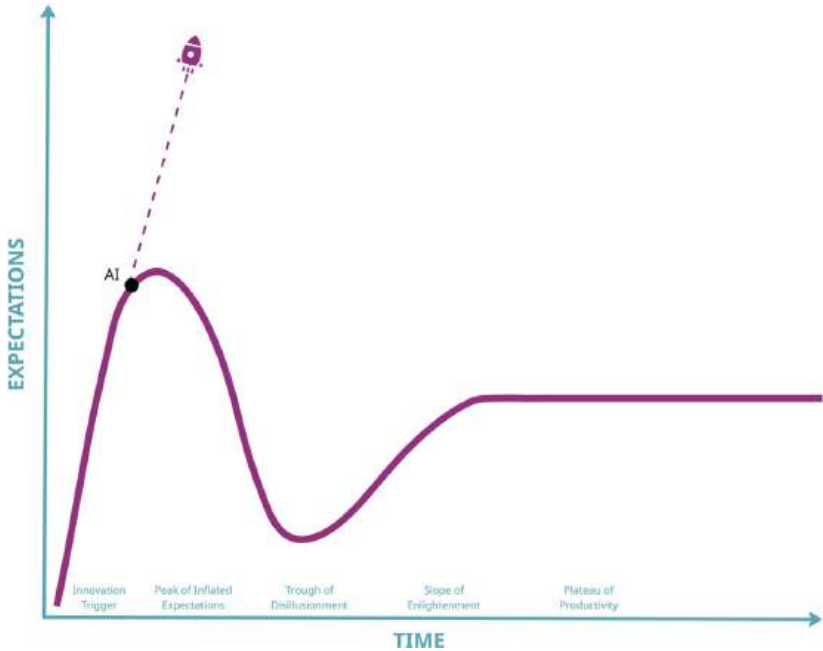


Fig. 17.2 AI Hype Cycle

conflict resolution, to Abrecht’s attempt to create humanitarian avatar-style ‘agents’ in the shape of avatar refugees and armed actors. However, the slightly boring reality is that in the PeaceTech field, AI will probably be most quickly and easily integrated into the practices of ‘conflict analysis’, ‘report writing’, and grant applications, which go on in numerous organizations engaging with peacebuilding.

Gen-AI classification of documents, to ideate solutions for conflict and to use AI to provide insights from data, are all likely to enter the plateau of productivity, even if Gen-AI as a concept hits the trough of despondency for a while (as seems likely). Gen-AI will help with ‘faster ingestion’ of material by organizations by helping people parse reports into topics, or produce faster literature reviews, particularly in a world where no one in the field has time to read anything anymore, and there are incentives to cut bureaucracy and staff. Gen-AI also clearly has potential to help turn

survey-type consultations into ‘agenda-setting’ tools for peace processes, as the Remesh example in Libya illustrated.

At an organizational level, AI is being, and will be, integrated into dashboards to make them more user-friendly, and to move from descriptive to predictive advice, and even beyond that to suggestive recommendations—all of which will require human discernment.

Where peacebuilding organizations do not fully move to Gen-AI integration, most entrepreneurial members of staff will use these tools of their own initiative, covertly or overtly. The danger will be whether they will do so with AI literacy or not. Training in understanding AI risk, prompt engineering, and AI integration will be needed.

For peacebuilders, however, environmental concerns about AI transparency, and ongoing improvement relating to alignment and hallucination will be vital. These concerns, of course, are not just for the peacebuilding community, but are part of a wider AI debate.

17.8 CONCLUSIONS

I finish this chapter with excitement, hope, and fear combined.

The fast pace of technological change, propelled by the development of AI, is changing the world we live in, and also the relationship between political power and tech companies, in ways that are impossible to predict but feel to be upending life as we know it, and not always for the better.

Yet, I cannot help remaining optimistic about the potential of PeaceTech to cut down bureaucratic tasks and create new possibilities for communicating, knowing, and changing life for the better. With so much technology invested in war, PeaceTech knowledge and practice also feels like a necessity. The pro-social design movement that aims to design for peace, in a bid to fight polarization and misinformation, is perhaps the best example of PeaceTech as necessary counter to WarTech.

For the reasons outlined it is very hard to predict how PeaceTech itself will carry across the Gartner Hype Circle. This book has oscillated between embracing PeaceTech and criticizing it, and I find myself oscillating between triumph and despair. PeaceTech: yay or boo? It can depend on the day and the tech example.

For the most part, I embrace PeaceTech optimistically, but I want to see it work with, rather than against, the human spirit. As I have engaged with the more ‘techie’ aspects of Gen-AI, I have been fascinated with the ongoing debate over what it means for AI to ‘become more like humans.’

The Turing ‘imitation’ test was passed when computers began to beat humans at chess, many years ago. Today, AI measurements show that machines now outperform humans in many domains.

However, it is the essence of being human that we are flawed. We do not do things perfectly, or even consistently. We do not hold infinite data in our heads or act rationally, even when it comes to our own lives. There is a wonderful unpredictability as to what humans do and who they are. There can be joy as well as conflict in difference and disagreement. The logics of war are difficult to change. Peacebuilding works by optimistically rejecting the idea that change from the perfect logic of war is impossible, and looking for creative ways to disrupt that logic.

What would the manifesto look like for PeaceTech as a manifestation of the human spirit for justice and peace, rather than a tool for better, faster, and more rational analysis? What does it mean to ‘humanize’ PeaceTech? And how do the decisions we make in the next years take us towards or away from that project?

For my Conclusion I set out some initial suggestions in a short ‘Manifesto’.

Questions

1. How would you place PeaceTech developments on the PeaceTech Hype Cycle graph?
2. What is your attitude to Generative AI and PeaceTech?
3. Where do you feel energized to take your own commitment to digital transformation of peacebuilding?
4. Where do you feel like running in the other direction?
5. What would your manifesto for how we use PeaceTech be?

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PeaceTech Manifesto

Abstract This book has given a short introduction to PeaceTech efforts focused on ending wars. It has also set out an assessment of the trajectory of PeaceTech development. Yet, there are many uncertainties as to how the practices of negotiating ends to armed conflict, and digital innovation in peacebuilding, will intersect to shape each other. To encourage discussion, I leave with a short and personal ‘PeaceTech Manifesto’ that sets out issues that I see as critical to PeaceTech’s future.

Keywords Double disruption · Manifesto

18.1 INTRODUCTION: MANAGING DOUBLE DISRUPTION

Digital transformation in all aspects of life is here to stay. It is characterised by ongoing fast-paced innovation in technology that forces a need for ongoing adaptation of business practices, tech governance, and modes of human interaction in processes that struggle to ‘keep up’. PeaceTech is part of this wider digital transformation, connoting the attempt to use digital tools for peacebuilding.

We are also in a moment where our practice of negotiating ends to conflicts is being radically re-shaped against a background of escalating war dynamics, de-funding of peacebuilding in favour of military spending,

and a loss of faith in international institutions and norms that underpinned negotiation practices and cohered international support for peace processes.

PeaceTech brings a broad suite of tools to long-standing peace negotiation practices, but at a moment when capacity to broker institutionalised ends to armed conflict appears to be very low.

In response, my manifesto has three parts. First, a call to retain faith in negotiated settlements, with all their faults, and to focus on where and how PeaceTech adds value. Second, a call to think more strategically as to how PeaceTech innovation can help cohere peacebuilding cooperation, rather than further fragment it. Third, a call to engage with technomorality in PeaceTech practice. I conclude, paradoxically for a PeaceTech advocate, with both a prediction and a call to re-embrace analogue agency.

I. Reinventing capacity to resolve conflict peacefully.

1. Conflict and mediation patterns are changing. A range of intersecting threats mean that the last decade has become much more dangerous to the point of our extinction. New approaches to peace mediation and peace processes need to be fashioned and combined with innovative thinking as to how technology is assisting war and can assist peace.
2. Ending conflict through practices of mediation and compromise between the main armed protagonists remains important. The only alternative is to hope that war resolves disputes or somehow fizzles out. However, even when victory and defeat are achieved, complex negotiations are required with armed actors around border delimitation, disarmament, reformed governance, and reconstruction. Therefore, no alternative to getting armed actors to agree exists if conflict is to be terminated.
3. Mediation needs new strategies of adaptation to deal with:
 - a. conflict fragmentation forming new complex conflict systems that combine local, national, transnational and geopolitical conflict;
 - b. a more chaotic mediation landscape with overlaid mediation initiatives, working with new assumptions and values, new connections to the conflict, and competing visions of acceptable outcomes; and

- c. reduced faith in international organizations and international norms as a mechanism of corraling state support for peace processes.

Digital innovation can be a valuable tool of mediation adaptation as the following examples show. PeaceTech is not the only tool for these activities, but it does offer some solutions of scale, reach, and analytical capacity that are beyond simple human approaches.

4. PeaceTech innovation can help with the following, in response:
 - a. Supporting better conflict analysis focused on understanding and mapping conflict fragments, their armed actors, their geographies, interests, and positions, for example through forms of AI.
 - b. Providing new forms of mediation analysis and ‘negotiation intelligence’ as to what mediation efforts are taking place, what their goals are, and how they might connect or undermine each other, for example through Peace Analytics.
 - c. Supporting new ideas as to how people in conflict are assembling and disassembling for peace and for war, with a view to supporting pockets of civiness where they emerge, for example by bringing multiple data sources together.
 - d. Widening civic involvement and supporting civic peace initiatives by supporting new forms of deliberation at scale, for example using DeliberativeTech tools.
5. Beyond direct mediation support, digital innovation has a vital role to play in addressing past peace process critiques by:
 - a. Helping local priorities for peace process outcomes to be more visible, heard, and accepted by international peace process supporters.
 - b. Supporting creative monitoring and implementation of peace promises by armed actors.
 - c. Helping peace process institutions such as National Dialogue processes with information management by providing tools that enable large-scale information to be dealt with, and hidden insights to emerge.

II. Balancing ad hoc innovation with strategic solutions of scale

6. PeaceTech offers tools to digitally transform particular peace-building tasks. However, task-focused PeaceTech may reinforce

an already-existing peacebuilding landscape where multiple ad hoc peacebuilding tasks are supported, at the expense of any strategy as to how PeaceTech as digital transformation of peace processes and peacebuilding itself could be supported.

7. There is no need to choose between supporting PeaceTech as an ad hoc improvement of existing practices, and PeaceTech as improved peacebuilding of scale. Both have their place. However, a central challenge involves building a PeaceTech ecosystem and tools in a way that enables multiple initiatives to flourish but also to minimally cohere.
8. The PeaceTech ecosystem needs to be built in a way that enables innovative once-off projects but also leaves space for ambition of scale. Funding for PeaceTech and AI projects often focuses on pilots. There is a much greater need to think about how to fund the underlying PeaceTech data and computing architecture, particularly in a context where the global power of digital providers is now entangled with forms of political conflict. Funding should support creation of a re-usable digital infrastructure accessible to even small local organizations, including projects supporting data ‘interoperability’, equitable access to compute power, and open-source tools.
9. As shrinking public funds are part of the current global dynamic, and peacebuilding and development budgets are particularly at risk, PeaceTech funding is likely to require a combination of donor, grant, philanthropic, business and venture capitalist funding. However, PeaceTech initiatives will need supported to access all of these forms of funding, while remaining true to peacebuilding values. Doing so will be challenging and is likely to require funding modalities themselves to be reinvented.

III. Reimagining technomoral futures

10. PeaceTech standard-setting is developing, as are ethical and risk standards for the use of particular technologies whether satellite imagery or Gen-AI. However, multiple standards are hard to bring together, and good standard-setting requires both technical knowledge, and capacity to appraise digital risks. Peacebuilders will need to be more adept at both. Providing effective standards will also require setting aside many of the assumptions underpinning our current regulatory frameworks,

to address PeaceTech harms such as lack of agency, the risks of population-specific data, and damage to peace processes.

11. Alongside better approaches to ethics, risk and harm, PeaceTech technomorality points to the need to understand the means and the ends of PeaceTech to be connected. Practitioners face a tough task of both using digital tools and challenging the ways in which they have been created, whether social media algorithms, or AI black boxes.

Conclusion: Analogue Agency

12. Finally, in the world of disinformation, algorithm control, conflict, economic insecurity and lack of hope, I would predict that face-to-face encounter and physical community will make a return as an attempt to reassert connection and agency. Peacebuilders should now think of creative ways to use tech to create physical communities that have capacity to connect and add up across space. What would a pocket-peace response to the risks of global conflict look like, and what role could digital tools play in creating it?

Questions

1. What is your manifesto, are there bits of mine you particularly agree or disagree with?
2. What would you add? What would you take away?

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