The Role of Private Technology Companies in Support of Mediation for the Prevention and Resolution of Violent Conflicts

Capstone Global Security
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Table of Contents

Executive Summary 2
Introduction 4
Technology Terms and Definitions 5
- Artificial Intelligence 5
- Big Data 5
- Blockchain 6
- Geographic Information Systems 6
- Online Dispute Resolution 6
- Social Media 6

Findings I: Understanding Peace Mediation Needs 7
- Integration 7
- Security 8
- Context 9

Findings II: Engaging Private Technology Companies 10
- Level of Engagement 10
  - Box 1: Levels of Engagement with Private Technology Companies 10
  - Box 2: Proprietary Versus Open Source 11
  - Box 3: Public-Private Partnerships 12
- Strategy 13
  - Box 4: The Office of the UN High Commissioner for Human Rights (OHCHR) Partnership with Microsoft 14
- Risks 14

Findings III: Applying Technology to Peace Mediation 16
- Conflict Analysis 16
- Inclusion 19
  - Box 5: The Thai Public Statement 20
  - Box 6: Blockchain 21
- Digital Negotiations 21
- Public Information and Communication 23
  - Box 7: Communication strategy during the crisis in Yemen 24

Recommendations 25
- Box 8: Questions to Ask When Engaging Private Technology Companies 25

Conclusion 26
Annex I: CyberMediation Dashboard: Digital Tools for Peace Mediation 27
References 33

Executive Summary

This report supports the work of the CyberMediation Initiative, a partnership formed by the United Nations Department of Political Affairs, DiploFoundation, the Centre for Humanitarian Dialogue, and swisspeace. The Initiative was created in March 2018 to examine how digital technologies are affecting the peace mediation process. The partners are evaluating the relevance and the use of technologies including social media, big data, and artificial intelligence to the work of mediators. The goal of this report is to contribute to this work by giving mediators a deeper understanding of the potential role of private technology companies in the field of peace mediation.

We focus on addressing three main questions: First, which private technology companies and digital tools could be used to contribute to peace mediation? Second, what are potential benefits and downside risks of partnerships between the private sector and mediation organizations in the area of digital technology? And third, as a tentative policy orientation, how can mediators best cooperate with private sector technology companies and apply digital tools in mediation activities?

Drawing on a review of the uses of digital technologies in other fields, as well as interviews with mediators, international affairs practitioners, technology experts, and private company representatives, we divide our findings into three main areas. First, we examine the needs of peace mediation to better understand how technological solutions can meet the demands of mediators. We find that to be effective, technological solutions should integrate into existing mediation processes, be secure, and adapt to local situation and technological contexts. Second, we analyze opportunities to engage the private sector, outlining considerations for mediators when working with private technology companies. We suggest that mediators should choose a clear framework of engagement, establish shared strategies and goals, and address potential risks. Third, to bridge the gap between mediation and technology, we present a framework for applying technology to peace mediation, organized into four categories: conflict analysis, inclusion, digital negotiations, and public information and communication. In each category, we outline our findings, present examples, and highlight risks. Conflict analysis focuses on technologies including data analytics, geographic information systems, and sentiment analysis. Inclusion addresses technologies including social media, cloud services, and blockchain. Digital negotiations explores technologies including workflow tools, teleconferencing, and cloud services. And public information and communication involves technologies including data visualization, social media, and instant messaging, among others.

We conclude with overall recommendations for optimizing the role of private technology companies in peace mediation. We suggest structural guidance for finding and engaging private technology companies and a checklist of questions peace mediators should ask before adopting private technology tools and partnerships.

To complement this analysis, our Annex features a dashboard of more than a hundred digital tools that could support the work of peace mediators. We also share an interactive version of this dashboard that allows mediators to find tools organized by the mediation category and the technology category.

Ultimately this work presents a framework to link the sphere of mediation to the sphere of technology and identify areas of cooperation and potential risks. This report provides a practical structure for evaluating and utilizing private technology company tools and partnerships to support the peace mediation process. We hope that it helps inform mediators of the benefits and risks of private technology involvement in the peace mediation process and find the best tools and companies to support their work.

Guidance

Lessons for Incorporating Technology in Peace Mediation:

- Technological solutions should easily integrate into existing mediation processes, considering the phases of mediation, the actors involved, and mediators' digital literacy and capacity.
- Technological solutions should be secure and protect confidential information from hacking, leaks, and disinformation.
- Technological solutions should fit different specific and regional contexts in terms of the situation on the ground and the technological landscape.

Lessons for Engaging Private Technology Companies:

- Mediators should choose the level of engagement: free user, customer, or partner, considering agility, resources, and time.
- Mediators should establish clear strategies with private technology partners, aligning goals and knowledge and considering motivations such as corporate social responsibility.
- Mediators should consider potential risks of private technological company partnerships, including security issues, misaligned priorities, and public perception.

Lessons for Conflict Analysis:

- Mediators must analyze the local technological landscape to determine Internet access, digital literacy, and the most-used tools and platforms.
- Digital technologies such as instant messaging applications, social media platforms, and sentiment analysis tools can crowdsource information and provide mediators with data about opinions, trends, and influencers.
- Crisis mapping, mainly using geographic information systems (GIS), can improve data analytics in peace mediators' research on conflicts.

Lessons for Inclusion:

- Digital technologies can allow mediators to engage with a broader audience, providing instant communication and access to people in hard-to-reach or besieged areas.
- Risks of digital inclusion include security concerns, the spread of false information, and filter bubbles that limit access.
- Blockchain technologies could provide a secure, transparent means of inclusion.

Lessons for Digital Negotiations:

- Contact through digital technologies such as instant messaging and teleconferencing can help increase access to stakeholders and reduce intergroup conflict.
- Workflow and file sharing tools on digital platforms can improve collaboration, information sharing, and archiving.
- Considerations to address include cybersecurity issues and the capacity and digital literacy of the mediators and the parties.

Lessons for Public Information and Communication:

- Digital technologies can help mediators shape and control the narrative in real time facing a broad audience.
- Mediators can use digital technologies such as social media platforms and sentiment analysis tools to identify influencers and amplify messages.
- Concerns include establishing trust and combatting false information and hate speech.

Introduction

Peace mediation for the prevention and resolution of violent conflicts has traditionally been considered a low-tech field focused on face-to-face interactions among people. In this process, the role of the mediator, a third party who assists groups, with their consent, to develop mutually acceptable agreements to prevent, manage, or resolve a conflict, has required interpersonal skills including emotional intelligence, empathy, and creativity (UN Guidance for Effective Mediation 2012). In today's digital world, however, the mediator's role also increasingly demands an understanding of the opportunities and risks of the cyber environment, in which digital tools from private technology companies are often being used to shape the relationships between actors of the mediation process and the security environment on the ground. This report explores the role of private technology companies in peace mediation and proposes a framework for mediators to evaluate potential private technology partnerships and digital tools and to understand their implications for the mediation process.

Drawing on a review of the current trends and uses of digital technologies in other fields, as well as interviews with mediators, technology experts, and representatives from private technology companies, our research focuses on examining three main questions. First, which private technology companies and digital tools could be used to contribute to peace mediation? Second, what are potential benefits and downside risks of partnerships between the private sector and mediation organizations in the area of digital technology? And third, as a tentative policy orientation, how can mediators best cooperate with private sector technology companies and apply digital tools in mediation activities?

This report is part of the CyberMediation Initiative, a partnership formed by the United Nations Department of Political Affairs, DiploFoundation, the Centre for Humanitarian Dialogue, and swisspeace to explore how digital technologies affect the work of mediators in preventing and resolving violent conflicts. Our aim is to present a practical guide that informs mediators of private technology companies' potential effects on mediation and to present a structure for considering the application of digital tools and partnerships to their work. Taking into account that peace mediation is a context-dependent and constantly evolving process, and that technologies continually update over time, this report presents an overview of potential private technology applications as they exist at the time of this writing. We hope that our framework, which allows for incorporating technologies as they develop, will help mediators identify specific technologies for use in mediation with a complete understanding of the potential benefits and risks.

Our research methodology includes a literature review and elite interviews. Given that there is little existing literature on the specific role of private technology companies in peace mediation, we took a multidisciplinary approach to conduct a review of relevant scholarly and grey literature in two macro fields: international relations and technology. We examined the application of technology in related international relations fields including online dispute resolution, public diplomacy, and response to humanitarian crises. We also analyzed trends and developments in digital technology, including artificial intelligence, blockchain, social media, and geographic information systems.

To complement this analysis and provide first-hand perspectives, we conducted more than twenty semi-structured elite interviews with experts, some of whom provided background information and some of whom we cite in this report. We interviewed professionals who work in mediation or related roles in order to gain insight into their activities, the challenges they face, and how technology is changing the environment in which they operate. We also interviewed practitioners in relevant and comparable fields who have had experience in engaging with the private sector from their public positions. In this regard, we tried to understand the main challenges and opportunities in establishing partnerships with the private sector. Academic experts on technology and the private sector helped us to frame our research with a theoretical background. Finally, representatives from private technology companies gave us a perception of different variables (i.e. business environment and corporate social responsibility) that can affect partnerships.

The conceptual approach of this report is to link the sphere of mediation to the sphere of private technology and identify areas of cooperation. To connect these fields, we divide our findings into three sections. The first section presents a brief overview of the mediation process and an analysis

of basic needs of mediators that technology could address. It includes a general understanding of the current uses of technology in the mediation process and high-level visions and concerns for further implementation.

The second section includes relevant considerations for including the private sector in mediation efforts, including types and strategies of involvement of private technology companies and a discussion of potential use cases and risks.

The third section is devoted to a framework for applying private sector technology to mediation based on the categories of mediation provided by the CyberMediation Initiative partners: conflict analysis, inclusion, digital negotiations, and public information and communications. In the context of this report, these categories are defined as follows:

- "Conflict analysis" is the way in which mediators research and analyze conflicts in specific local contexts.
- "Inclusion" relates to efforts to involve diverse, underrepresented voices in the mediation process.
- "Digital negotiations" involves the exchange of information among conflict parties and mediators, either in one-to-one or group channels.
- "Public information and communication" refer to the processes by which mediators shape and share the narrative about specific conflict and peace efforts to a public audience.

In each category, we present relevant lessons from efforts to apply technology to other international relations fields that could inform how mediators incorporate technology in their mediation practice. We also discuss opportunities for using technology in each category, including examples of use cases of specific companies and tools, and suggest general potential downside risks for consideration. We conclude with an analysis of the key lessons learned from this research and present an actionable summary of recommendations for mediators. We also provide an Annex that includes a non-exhaustive list of private technology tools, organized in mediation and technology categories.

Technology Terms and Definitions

Several technologies have potential implications for the peace mediation field. As we analyze the role of private technology companies, we first must establish what we mean by these broad terms in this specific context. Below are several definitions of key technology concepts, as well as a brief analysis for how they relate to peace mediation. In the following sections, we will build out on these definitions to present concrete applications for applying digital tools that fall within these larger technology areas.

Artificial Intelligence

Artificial intelligence (AI) enables computer systems to perform tasks normally performed by humans (Marr 2018). Different AI technology systems include robotics and autonomous vehicles, computer vision, language, virtual agents, and machine learning (Bughin et al. 2017). Benefits of AI include its ability to increase efficiency, security, and decision-making in conflict situations and many other contexts through automation and by making processes faster, smarter, and cheaper (Digital Watch 2018). It can also help design cybersecurity systems that increase security and reduce the risks of cyber threats (Digital Watch 2018). Case-based reasoning involves AI learning about different cases and then making predictions, which can help the user focus their attention and solve problems (Sycara 1993). Risks of AI include ethical, legal, and technical challenges. AI algorithms could reflect biases of their creators, there are concerns about privacy and security (Digital Watch 2018), and there is currently a limited legal and regulatory framework regarding the use of AI (Lanz 2018).

Big Data

Big data is "data that contains greater variety arriving in increasing volumes and with ever-higher velocity" (Oracle 2018). In other words, big data is quantities of data that are too large to be processed without the help of specialized processes and software for data handling and processing. It has huge potential as a tool for quantitative research because it includes rich data, high

velocity, local information, and diverse sources (Karsten Donnay, interview, September 29, 2018). Possible issues include the fact that what kind of information is collected and when it is collected are typically outside the collector's control, and so there is often no standard format or coding, and relevant information may be missing (Karsten Donnay, interview, September 29, 2018). In the context of mediation, big data technology could create open online platforms that allow a large number of people to participate in peace talks (Lanz 2018). It could also help in conflict analysis, as efforts to collect data on conflict have shown effectiveness, according to peace and conflict research (Gleditsh et al. 2014).

Blockchain

According to IBM, "Blockchain is a shared immutable ledger for recording the history of transactions" (IBM 2018). The most prominent characteristic of the blockchain is the absence of central control over the ledger, i.e. bookkeeping of all transaction records, which results in a decentralized storage of information, thus the communication occurs directly between peers and all the other nodes (Iansiti and Lakhani 2017). The most popular application of blockchain is Bitcoin, a digital cryptocurrency. The "peer to peer" networks and open-source foundation of blockchain have made three principle promises: transparency, decentralization, and security (Narayanan et al. 2016; Tapscott 2016). Therefore, blockchain has the potential to bridge the gap of trust between institutions and people (Hughes 2017; Iansiti and Lakhani 2017; Tapscott 2016). The openness and absence of central control also promotes democratic inclusivity (Iansiti and Lakhani 2017). Peace mediators can potentially benefit from the trust-building and inclusivity embedded in this technology.

Geographic Information Systems

Geographic information systems (GIS) technology can be found in satellite imagery, street maps, and other cartographic representations. "Geographical information systems (GIS) provide tools to create, transform, and combine georeferenced variables." (Teodoro und Duarte 2013). GIS finds its application in many, often unsuspected fields, as its use can help decision-making processes by creating visual support materials. Given its "unique capability, GIS reveals deeper insights into data, such as patterns, relationships, and situations" (esri n.d.). In the context of mediation, it could most likely be used in the context of conflict analysis by providing an overview of a particular region and providing insights into specific conflict areas by monitoring movements of populations and providing historical data of specific areas (Tsendnyam 2016).

Online Dispute Resolution

With the emergence of new Internet technologies came the creation of Online Dispute Resolution (ODR) systems, which are "a form of online settlement that uses alternative methods for dispute resolution" (Wahab et al. 2012). ODR mechanisms vary in nature and range from referral platforms for finding mediators or adequate arbitration platforms, to fully automated dispute resolution systems supported by artificial intelligence. This alternative method of dispute settlement can prove particularly useful for mediators in that it involves cost- and time-saving measures through the implementation of remote participation and communication, streamlining and sorting vast amounts of documents with the help of software and, if desired, automated decision-making.

Social Media

Social media platforms are sets of tools that could benefit mediators thanks to their ability to put individuals in a starring role, as well as implement engagement with broader audiences. They can represent a useful tool for communication strategies meant to support the mediation narrative. Social media are based on three pillars: communication, transparency, and participation (Phillips 2015). Social media allow users to reach a broad audience. They represent an open source of information in which people can access public documents, as well as participate and engage with the actors involved in a process. While social media use was almost nonexistent seven years ago, today many actors use social media, which makes it especially relevant for peace mediation.

Findings I: Understanding Peace Mediation Needs

Guidance:

- Technological solutions should easily integrate into existing mediation processes, considering the phases of mediation, the actors involved, and mediators' digital literacy and capacity.
- Technological solutions should be secure and protect confidential information from hacking, leaks, and disinformation.
- Technological solutions should fit different specific and regional contexts in terms of the situation the ground and the technological landscape.

Integration

National and international institutions have adapted their structures to meet the revolutionary changes caused by new technologies. As the UN Secretary-General Strategy on New Technologies stresses, the "engagement with new technologies is necessary for preserving the values of the UN Charter and the implementation of existing UN mandates." (UN 2018, 4). To integrate new technologies into the field of mediation, these technologies must align with the existing mediation processes and demands.

Mediation, which is used in about fifty percent of international crises (Beardsly et al. 2006), is a "process whereby a third party assists two or more parties, with their consent, to prevent, manage or resolve a conflict by helping them to develop mutually acceptable agreements" (UN Guidance for Effective Mediation 2012, 4). The mediation process occurs over time over different phases, and the type of strategy can vary depending on the phase of the conflict. As an overview, these phases include the "pre-negotiation phase," defined as the building and keeping contacts over a defined period of time that could last from a year to decades; the "negotiation phase," which is the support of the development of a vision of society and political issues as a form of power-sharing; and the "implementation phase," characterized as the enforcement of what has been agreed to in the peace negotiations (Mason 2007).

The phase of the mediation process has a direct link to the category of action required and thus the specific opportunities to apply technology. The CyberMediation Initiative identified four broad categories: conflict analysis, inclusion, digital negotiations, and public information and communications (2018). While there are potential overlaps, knowing the mediation phase can indicate the appropriate category and thus relevant technologies, providing a useful framework for the application of digital technologies to the mediation process. For example, the pre-negotiation phase has an emphasis on conflict analysis, the collection and analysis of data about the conflict. As one mediator explained, "You need to identify the actors and their interests, their position, what are their best alternatives, in order to come up with a strategy" (Mediator, interview, August 24, 2018). The negotiation phase is concerned largely with the digital negotiation category, and the implementation phase applies to the public information and communication category. Inclusion efforts can occur throughout the process. In the "Findings III" section below, we expand on each of these categories and the relevant technologies and potential digital tools and partnerships.

It is also important to consider the actors involved in the mediation process. Mediators are credible individuals, groups or institutions internal to the conflict that can exert their influence to encourage dialogue (UNDP 2014). These mediation actors can include international organizations, regional organizations, states, individuals and, increasingly, non-government organizations (Lanz and Mason 2009). As the mediation process becomes more inclusive, as we will discuss below, it also increasingly involves stakeholders who are

typically not heard but who can offer different perspectives and new ideas, such as members of civil society, women, and youth (Paffenholz 2014). There are also four Tracks that identify different actors in the process: Track 1, involving leadership of conflict parties; Track 1.5, involving leadership of conflict parties in informal settings; Track 2, involving influential persons not directly affiliated with conflict parties; and Track 3, involving members of communities within conflict societies (Lanz and Mason 2009). John-Paul Lederach breaks the stakeholders down into three levels: top leadership, middle-range leadership, and grassroots leadership (2004). A solid understanding of who is involved in a particular mediation context — as well as their digital literacy, access to technology, and capacity for incorporating digital tools in their work — must be established to determine the best application of technology to their capabilities and needs.

"You have to look at people's work flow and make it not painful for them" — Mediator

Mediators interviewed for this research also highlighted two concerns within the context of integrating technologies seamlessly into existing mediation processes. First, they stressed that the use of any new digital tools must fit within mediators' existing workflows. In other words, the tools should help to improve productivity or support existing activities, not add undue time or difficulty to a mediator's already demanding jobs. As one mediator explained, "You have to look at people's work flow and make it not painful for them" (Mediator, interview, August 24, 2018). Second, they mentioned the importance of not over-selling the power of technologies or setting unrealistic expectations of technologies as silver bullets that can instantly solve a problem. Mediation remains at its core an interpersonal exercise; the challenge is to use technology to support and amplify mediators' work in a practical way, as we will expand upon in the following sections.

Security

All of the mediators we spoke with emphasized the importance of cybersecurity and the protection of information on digital platforms. The mediation process often involves sensitive information and includes an expectation of confidentiality and data protection. Therefore, there is often concern over the risks of leaks and hacks, which can often be amplified with the introduction of new technologies. At the same time, the spread of untrue information can hamper the mediation process. Technology partnerships and the use of digital tools in the mediation process must thus pay specific attention to issues of trust and truth.

In recent years, there has been an increase in cyber threats, with high-profile hacks, including WannaCry and NotPetya in 2017 affecting public and private organizations (Poppensiker and Riemenshnitter 2018). In 2018, news that a cyber-attack against Facebook had exposed the personal information of about 50 million users raised concerns that the social media giant and other digital platforms were vulnerable to attack (Isaac and Frankel 2018). The threats of hacks or leaks of information present a pressing issue to the mediation process because the risks of exposure are high, and transparency is often weighed against confidentiality. "In the IT world, it's all open-sourced, sharing, the more openness the better, but we still need to keep some things confidential" (Mediator, interview, August 24, 2018). One concern is that unfriendly governments may access private information that allows them to target individuals. Many of the mediators we spoke to highlighted the importance of confidentiality as a means of ensuring the physical safety of the participants to the mediation process, many of whom live in conflict zones, as well as the integrity of the mediation proceedings.

"In the IT world, it's all open-sourced, sharing, the more openness the better, but we still need to keep some things confidential." — Mediator

Mediators may currently take steps to address these concerns, such as speaking to sources in person rather than via digital tools. When speaking in person is not possible, and digital tools must be used, there is an increased emphasis on security. However, very basic but effective protective measures can also be taken by training all people involved in mediation processes on "digital hygiene." These are measures that range from maintaining updated antivirus programs to avoiding and verifying links sent from unknown accounts to covering camera lenses when they are not being used. Given the interconnectedness of

digital technology, these grassroots measures can not only protect the actors' own data but also avoid spreading malware and other malicious software among the partners of the process.

Another very powerful solution to increase protection levels can be reached through encryption. Encryption, the translation of information into code to protect access, offers a potential solution to concerns about cybersecurity (Kaye 2015). "[Encryption and anonymity] enable private communications and can shield an opinion from outside scrutiny, particularly important in hostile political, social, religious and legal environments" (Kaye 2015). Encryption not only plays an important role in ensuring people's privacy and protection but also represents a promising method for the safeguarding of sensitive information about the overall mediation process. Combined with blockchain, AI, and other enhanced technologies, encrypting information might prove a helpful addition to mediators' efforts in securing mediation processes.

"There is no technology that is going to guarantee that a negotiation process is going to succeed." — Sanjana Hattotuwa

Some of the mediators we spoke with also highlighted the potential issue of misinformation being spread on digital platforms and the need to protect and promote truth in and about the mediation process. The pursuit of truth is especially relevant in the conflict analysis work — to ensure that the information gleaned about the conflict is accurate — and in the public information and communications strategies — to promote the true outcomes of the mediation process to a wider audience. As a recent study found, lies spread more quickly than truth online (Vosoughi et al 2018). Online, it can also be difficult to tell who is spreading the information and even whether the user is a person or an automated bot (Morse 2018). These concerns about the trust of confidentiality and the truth of data must be addressed before incorporating technology into the mediation process. It is also important to consider that issues of security will likely vary from context to context.

Context

There is no one, off-the-shelf technological solution that can respond to the needs of all mediators in all contexts. The mediation process is a highly specialized activity that uniquely responds to each conflict, taking into account "the causes and dynamics of the conflict, the positions, interests and coherence of the parties, the needs of the broader society, as well as the regional and international environments" (UN Guidance for Effective Mediation 2012, 4). Given the specificity of the mediation process, many of the mediators and experts we spoke to stressed that technological solutions must also be context-dependent and respond to the dynamics of a given conflict, as well as the needs of the mediators and the parties involved and the technological landscape of the conflict in terms of digital literacy, Internet access, and the most-used digital tools and platforms in the area.

"Mediation is different in every context, and innovation is different in every context," explained Maude Morrison, Program Manager of Build Up, an organization that supports the application of technological tools and innovation for civic engagement and peacebuilding (Maude Morrison, interview, September 12, 2018). "What's more important is the tools used to design a specific innovation, understanding how you go about it in a particular mediation process, how you go about designing a tech process or tool that works for that problem or tool or context, rather than imposing certain tools on mediation more generally" (Maude Morrison, interview, September 12, 2018). Sanjana Hattotuwa, Special Advisor for the ICT4Peace Foundation, an organization that explores the use of information and communication technologies for peaceful purposes, also emphasized the importance of understanding the context and the intended outcomes of the mediation process. "There is no technology that is going to guarantee that a negotiation process is going to succeed" (Sanjana Hattotuwa, interview, August 21, 2018). In other words, the effectiveness of a technological solution depends on how well it conforms to the specific goals and context. Conflict analysis, as we will explore below, can help mediators evaluate contexts to find the best technological solutions.

Findings II: Engaging Private Technology Companies

Guidance:

- Mediators should choose the level of engagement: free user, customer, or partner, considering agility, resources, and time.
- Mediators should establish clear strategies with private technology partners, aligning goals and knowledge and considering motivations such as corporate social responsibility.
- Mediators should consider potential risks of private technological company partnerships, including security issues, misaligned priorities, and public perception.

Level of Engagement

There are different ways mediators can engage private technology companies and their products and services: as a free user, as a customer, or as a partner, explained Mark Nelson, Co-Director of the Stanford Peace Innovation Lab (Mark Nelson, interview, October 3, 2018). "Free user" involves using the tools or applications already available, "customer" involves paying to use a product or service, and "partner" involves forming a new cooperation to build specific products or services in the support of specific goals (Mark Nelson, interview, October 3, 2018). The levels range in terms of agility, with the free user engagement being the least time- and resource-intensive, and the partner engagement the most. Mediators should thus consider the time frame, budget, and specific goals when deciding which level of engagement with a private technology company makes the most sense in a specific mediation context. It is also important to note that depending on the private technology company, only one or some of these options might be available.

Box 1: Levels of Engagement with Private Technology Companies

Level	Description	Benefits	Downsides	Examples
Free User	Use of free tools and applications	Quick and easy to set up and use	Low customization, low data privacy	Twitter, Facebook, WhatsApp, Slack
Customer	Paid use of product or service	Customization and customer support	Requires budget and takes time to set up	Salesforce Social Studio, Skype for Business, ArcGIS
Partner	Cooperation for new products or services	Tailored products and services	Very time-intensive, hard to sustain	OHCHR partnership with Microsoft, Alibaba Hangzhou Smart City

The "free user" level of engagement is typically one-sided, with the mediator acting as a user of the offerings of a private technology company, with low or no input from the company. This level of engagement has a high level of agility, in that it is easy to set up and use. However, it often has restrictions on elements such as customization or depth of analysis, and it is possible that the companies use the user data in ways that cannot be controlled by the user. Many of the mediators interviewed for this research are already engaging with private technology companies as users, such as when they use WhatsApp to message someone engaged in the mediation process or when they read or share news on Twitter. There may even be possibilities to use free tools beyond the prescribed uses of the tools. "You can just download the app and start using it to do whatever you want, and you can use it to do things [private technology companies] never envisioned anyone would do with their app" (Mark Nelson, interview, October 3, 2018).

The "customer" level allows for more customization and analysis. However, this type of interaction is less agile, taking more time and budget than the "free user" option. Given the importance of contextualization in the mediation process, having a more hands-on, customizable option might be effective in some scenarios. It is also important to consider who would be maintaining any paid tools and the process for setting them up and then re-tooling them to fit different contexts or stages in the mediation process.

The "partner" level of engagement is the most complex of the three. It requires the highest degree of time and resources, often requiring additional staffing to sustain. The benefits are that it allows for complete customization and a merging of the expertise from both sectors to work towards a targeted goal in a specific context. As Karsten Donnay, Assistant Professor of Computational Social Science Organization at the Center for Data and Methods in the Department of Politics and Public Administration at the University of Konstanz, Germany, explained, "All of these things, they don't come out-of-the-box to work the way that you would wish" (Karsten Donnay, interview, September 29, 2018). A more integrated partnership allows both parties to be more innovative in applying technological solutions in helpful ways.

Box 2: Proprietary Versus Open Source

It is important to introduce a distinction for the "free user" level of engagement. Software products can be proprietary, meaning that the systems are provided by commercial software firms, which can decide to offer these services for free, usually getting highly valuable user data in return. Another type of "free" software is open-source software, meaning that the software codes are "publicly available for the good of the community" (Bridge 2018). Open-source software is modifiable, and users are generally seen as co-developers because users can adopt the software to their particular needs.

Apart from being free, advantages of open-source software include its large applicability across platforms by not being tied to a particular firm's software, its position in a community that continuously develops the software and is fast to fix software bugs and errors, its high level of adaptability. However, downsides of open-source technology are that it requires a certain level of expertise, especially regarding the development or adaptation of specific tools. This is also why open-source interfaces might sometimes appear less user-friendly, because developers' focus tends to be less on developing an easy-to-use interface and more on creating performing software. Additionally, given its free and community-based nature, it might not always be easy to find customer support, and some users might try to exploit publicly available bugs and issues.

Linux is probably the best-known open-source operating platform. Other well-known open source softwares are WordPress, a blogging website, Mozilla Firefox, an online browser, and Mozilla Thunderbird, the community's email client, as well as Libreoffice, an open-source version rival of Microsoft Office. An interesting element to take into account when selecting these tools, is that developers of open-source-based software such as Mozilla are often very concerned with privacy protection (Murnane 2018).

As previously mentioned, cybersecurity and confidentiality are key challenges for mediation processes and pressing concerns for mediators. On the "consumer" or the "partner" level, mediators might be able to establish collaboration frameworks that could help to secure the mediation processes, as these are services typically provided by cybersecurity firms. In practice, this might mean an additional partnership with a cybersecurity firm or the consultation of a cybersecurity expert for securitizing the different levels of engagement beyond what is offered by the private technology company.

Box 3: Public-Private Partnerships

In the context of forming a role for private technology companies in mediation, it is helpful to consider the literature on public-private partnerships. Public-Private Partnerships (PPPs) have become an important policy making tool for international organizations and national governments. "Global public—private partnerships are voluntary agreements between public actors (IOs, states, or sub-state public authorities) and non-state actors (non-governmental organizations [NGOs], companies, foundations, etc.) on a set of governance objectives and norms, rules, practices, or implementation procedures and their attainment across multiple jurisdictions and levels of governance." (Andonova 2017, 2). Forms of PPPs vary and can range from simple contractual engagements to long-term factual partnerships. Therein, the levels of responsibility carried by the respective partners also vary (Sharma und Bindal 2014).

PPPs are not specific to one sector in particular, but they can rather be implemented in many different areas of collaboration. Pressures stemming from growing populations, urbanization, and climate change have forced governments and other institutions to look for new means of support (Sharma und Bindal 2014). For example, the Open Government Partnerships promotes a multi-stakeholder approach, bringing together actors from banking, mining, and human-rights organizations to foster transparency and openness (Mendoza 2015). Another very prominent public-private collaboration is that of GAVI, the international vaccine alliance, which brings together key stakeholders by combining the technical expertise and legitimacy of international institutions such as the WHO and UNICEF with financial knowledge from the World Bank and from private donors and established businesses. The information communication technology (ICT) sector specifically was included into the process of the Millennium Development Goals (MDGs) in the early 2000s and culminated in the creation of the Broadband Commission for Digital Development in 2010 in order to facilitate ICT's cross-sectoral implementation (Taylor and Christian 2016).

In the context of achieving the UN Sustainable Development Goals (SDGs), many UN organizations such as UNITAR and UNECE have already engaged in collaborative frameworks with companies and private donors. The UN website for SDGs even offers a registry listing partners' commitments and partnerships for the sustainable development (United Nations n.d.). The website offers a feature to check existing partnerships, register new partnerships, and track the progress of certain commitments. Given mediation's contribution to peace and various SDGs, with especial relevance to SDG 16 "Peace, justice and strong institutions," there might be ways to create synergies between the SDG partnership portal and mediators in order to build partnerships and enhance capacity development and technological transfers (United Nations, n.d.).

Public-private partnerships are also increasingly used in the building of connected "smart" infrastructures. In Hangzhou, China, for example, private technology company Alibaba has partnered up with the municipal government to create the ET City Brain (Alibaba Cloud 2017). The program allows for the optimization of the allocation of public resources, especially in the transportation sector, and corrects urban operations in real-time, thanks to a constant monitoring of data. As a result of the partnership, the response time for accidents was decreased, incident identification accuracy was increased considerably, and the use of improved public transportation services was increased by seventeen percent. This type of partnership exposes the company's products and services worldwide while benefiting the Hangzhou's municipal infrastructure. Despite other factors being at play that might deserve deeper analysis, this constellation offers a win-win situation for both partners.

Strategy

When establishing partnerships, mediators and representatives from private technology companies must align different cultures, priorities, and expectations. As Anna Leander, an expert in the commercialization of security matters, explained, "You need to have the side of the user of a technology who actually has ideas about what they want to do and how and combine that with people who have a technical imagination" (Anna Leander, interview, October 17, 2018). On the one side, mediators have a vast wealth of knowledge about mediation processes, best practices, and the specific context of the conflict, but they may have little knowledge of specific technology tools, risks, or developments. Many of the mediators we spoke to expressed an interest in learning more about how technology could be applied to their work, and the CyberMediation Initiative is a testament to that demand.

Technology experts, on the other side, bring specific expertise in their area of technology and their particular service or tool, but it is likely they do not have the background in peace mediation and lack an understanding of specific contextual needs and considerations. Many of the technology specialists we spoke with about the potential role of technology in mediation emphasized the importance of first understanding the strategies of the mediation process. As Alec Ross, former Senior Advisor for Innovation at the United States Department of State, explained, "They are not experts in geopolitics; they are nerds from Silicon Valley" (Alec Ross, interview, September 20, 2018). Bo Pang, Software Development Manager at Amazon Web Services, also highlighted the importance of technology partners learning the needs of mediators (Bo Pang, interview, August 30, 2018). Therefore, it is important to establish a dialogue from the onset to share information and establish shared goals.

"They are not experts in geopolitics; they are nerds from Silicon Valley." — Alec Ross

A key element to this dialogue should be setting boundaries of time, project, and money that take into consideration both the specific context of the mediation as well as the specific role technology will play (Anna Leander, interview, October 17, 2018). As explained in the section above, mediation is a very context-dependent process. Likewise, technology also works best if it can be tailored for a specific use, rather than falling back on using a standard blueprint. "There's a fetishization of technological solutions… But there's a need to really think through what it can do in context" (Anna Leander, interview, October 17, 2018). Such a partnership requires a process structure that sets clear expectations but also allows for some flexibility to adapt as necessary over time (Anna Leander, interview, October 17, 2018). From an organizational design perspective, the introduction of technology brings with it a structure that relies on the interaction between people and the technology (Orlikowski 2000). In is thus important to think of technology or users now as independent actors but instead consider the ways in which they interact.

"A lot of these private tech companies know that their tools are being used to foment violence… If you can leverage their existing toolset for good instead of ill, they then would be very interested" — Alec Ross

When thinking of ways to establish a better understanding of the respective expertise and world views, it is also important for mediators to get to know the various organizational models of technology companies. Some technology companies have created innovative working conditions for their employees in order to increase productivity and express their commitment to society through their corporate social responsibility strategies. Google employees are encouraged to use up to twenty percent of their time on projects they are interested in (Groysberg et al. 2011, 9). According to the CISCO website, the company is committed to measuring its own success by its positive impact on people, society, and the planet. Indeed, one of the company's technology experts we interviewed highlighted that trainings for

mediators might be a project that helps society, and therefore could be taken into consideration (Technology expert, interview, November 23, 2018).

Box 4: The Office of the UN High Commissioner for Human Rights (OHCHR) Partnership with Microsoft

Private technology companies could possess the expertise to provide digital tools and the ability to meet the specific needs of international organizations. Jean Yves Art, Director of Strategic Partnerships at Microsoft, explained that tech companies are eager to collaborate for peacebuilding and conflict resolution ends as a statement of their ethical values and principles, as well as a form of balance between the support to the military sector and the political mediation one (Interview, October 26, 2018).

The strategic partnership between Microsoft and the Office of the High Commissioner for Human Rights (OHCHR) is an example of such a public-private partnership. The five-year-long partnership was launched in January 2018 and will provide a grant of 5 million USD to support the activities of the OHCHR in the field and in its headquarters in Geneva. It represents a strong involvement of the private sector as a provider of specifically built tools for the activities of a UN body. The aim is to create a software "alert system" to identify potential violations of human rights and analyse data for more than twenty databases.

It is also important to consider the motivations for private companies to engage in an active way in the mediation process, as these motivations can influence when and how companies form partnerships. Partnerships can serve to promote a company's corporate social responsibility. Approaching companies through their corporate social responsibility departments might also in some cases prove to be a better way into the world of technology given the backgrounds of employees typically working in these departments. Partnerships with the public or not-for-profit sector can also help to relieve bad press and promote the company's self-perceived values (Alec Ross, interview, September 20, 2018).

Many technology platforms consider themselves to be neutral, but they are not immune to actors using their products for negative purposes, which can hurt their bottom line. For example, Facebook's stock dropped about twenty percent in July 2018 after reports of the Cambridge Analytica scandal, in which personal data was used to target users, and concerns over fake news (Cherney 2018). "A lot of these private tech companies know that their tools are being used to foment violence… If you can leverage their existing toolset for good instead of ill, they then would be very interested" (Alec Ross, interview, September 20, 2018). This incentive might also translate into an arrangement that benefits mediators in the form of reduced fees. "If you can generate some glory for them along the way or good PR for them about how you're using it to really make the world a better place, that's sort of bonus points for why they give you discounts" (Mark Nelson, interview, October 3, 2018). Understanding the motivations of private company to join partnerships can help mediators establish aligned goals for peace, as well as raise potential risks, as we will explain below.

Risks

There are many challenges to establishing partnerships between mediators and private technology companies. As we explained above, a large concern, according to many of the mediators we spoke with, is the risk of hacking and worries about the data security on digital platforms, suggesting cybersecurity should be a priority in any conversations about potential partnerships. However, there are also other potential hidden risks that could hamper the partnership unless addressed upfront: lack of awareness and resources, misalignment of priorities, and outside influences on a closed process.

One of the main issues of forming partnerships with private technology companies is the lack of awareness members of the technology community have about peace mediation. Many authors who write on PPPs acknowledge that PPPs come with their own sets of challenges (Mendoza 2015). Challenges include the lack of expertise of private companies regarding certain issues or points of contention (Sharma and Bindal 2014). Another issue is the asymmetric information and resources between the use of technology for defense and the use of technology for peace. Ross summed up the

discrepancy: “I wish the peace sector was as big as the war sector,” but he also highlighted the potential to apply technology to fields like peace mediation that can use the same digital tools for good: “The same tools that can be used to deploy marines can be used to deploy peacemakers” (Alec Ross, interview, September 20, 2018).

An additional challenge is the potential misalignment of priorities. There can be a risk that private technology companies only pursue partnerships to further their own public-relations, policy, or other agendas. “They’re doing [a partnership] for their own agenda, and their agenda will usually not be fully aligned with yours” (Mark Nelson, interview, October 3, 2018). If goals and priorities are not established at the beginning, there is a risk of wasting time and not achieving actionable results. “You end up doing the mediation you’re working on and mediating with your industry partners at the same time” (Mark Nelson, October 3, 2018). Within this context, there is also a risk that the partnership does not serve the specific needs of a project. The technology experts we spoke with emphasized the importance of finding specific solutions that work within each context, not becoming stuck to a specific vendor at the expense of agility. “You have to be agnostic about the technology. You have to map to whatever is appropriate” (Alec Ross, interview, September 20, 2018).

A related challenge is the risk of private technology companies affecting the mediators’ perceived neutrality in the process. The benefits of the partnership could be unequal, which could cause tensions in the partnership and create unrealistic expectations for a specific outcome. There also could be lack of the necessary understanding of public institutions about market dynamics that might influence certain private sector behaviors (Sharma and Bindal 2014). Being bound by market dynamics can mean that certain commitments of a partner have to be revisited or are affected by global commercial influences, which might not align with mediation long-term needs. There is also the risk that a private company, while supporting a specific project, would pursue its own interests at the expense of the process goals, as a project coordinator in a related field explained. These concerns drive home the importance of establishing a dialogue at the onset of partnership negotiations, establishing shared goals, and maintaining flexibility and open communications throughout the process.

Findings III: Applying Technology to Peace Mediation

Conflict Analysis

Guidance:

- Mediators must analyze the local technological landscape to determine Internet access, digital literacy, and the most-used tools and platforms.
- Digital technologies such as instant messaging applications, social media platforms, and sentiment analysis tools can crowdsource information and provide mediators with data about opinions, trends, and influencers.
- Crisis mapping, mainly using geographic information systems (GIS), can improve data analytics in peace mediators' research on conflicts.

Conflict analysis, the way in which mediators research and analyze conflicts in specific local contexts, is a central part of the peace mediation process. A "political map" is necessary for mediators to be able to answer questions about key constituencies and their various motivations in conflicts (Brahmi and Ahmed 2008, 5). Tanju Arslan, IT and Change Director of Bupa Global, and Bo Pang, from Amazon, advised against generalization in applying technologies and suggested segmenting the stakeholders and paying attention to local regulations and experiences to address the needs of various actors in the peace mediation process (Tanju Arslan, interview, September 13, 2018, and Bo Pang, interview, August 30, 2018). Adriana De Oro Osorio, the focal point at International Trade Centre Innovation Lab for the United Nations Innovation Network, said context was the key to "appropriate and sustainable solutions" (Adriana De Oro Osorio, interview, September 10, 2018).

The underlying connection between the insights into the specific contexts of the conflicts and eventual positive results of the peace mediation process suggests that given the proliferation of digital technologies and platforms, tools such as instant messaging with relevant actors, big data, social media, and sentiment analysis could be meaningful. The crowdsourcing of information and crisis mapping are some of the most promising uses of digital tools identified and proposed for conflict analysis (HHI 2011). In implementing these two methods, mobile-phone-based technology is said to be the preferred solution, as mobile technology already has a broad application in housing assistance, communication and reconnection of families, early warning systems, safety and surveillance, accessing education and healthcare resources, mobile payments and vouchers, and logistics support (Weidman 2015 and PwC 2017).

Crowdsourcing of information is possible through instant messaging applications and various social media platforms. Many international affairs practitioners we spoke to mentioned an extensive use of instant messaging applications within their organizations. WhatsApp and Telegram for example, are some of the applications repeatedly mentioned for their use of information gathering on the ground, direct reporting about the conflicts within the organization, and facilitating logistics such as convening meetings. Beyond the original use of exchanging daily conversations, the interviewees described the instant messaging applications as an alternative to their conventional information channel that conveys complementary information on conflict situations.

Social media is another tool featuring a massive amount of information that helps to obtain updates of situations of both the individuals and the local organizations involved in conflicts almost in real-time. Big data is a meaningful technology to harness knowledge about the situation on the ground by monitoring public conversations online (Karsten Donnay, interview, September 29, 2018). Using big data gleaned from Twitter to look at the

structure of conversations, the most active users and accounts, and the content of the conversations, one may be able to make predictions or tell trends of certain events (Karsten Donnay, interview, September 29, 2018). With the development and popularity of opinion-rich platforms, sentiment analysis dealing with what online users think and how they feel has attracted much attention (Bo Pang and Lillian Lee 2008). Alec Ross also reaffirmed the significance and necessity of sentiment analysis using technology: "Sentiment analysis not using technology at this point is not using the best tools that are out there because you can get such granularity and you can get much larger sample sizes" (Alec Ross, interview, September 20, 2018). A number of technology experts stressed the potential of artificial intelligence, especially its dominant approach — machine learning — in the process of the crowdsourcing of information. Pervasive in many interactive online platforms and tools, artificial intelligence optimizes the results of search and can save significant work time.

"Sentiment analysis not using technology at this point is not using the best tools that are out there." —Alec Ross

Arash Tavakoli, a researcher in artificial intelligence, expressed his concern when talking about the availability of technologies to the general public, saying "It is a problem and a blessing at the same time… The issue is, with this wide release of these powerful codes, one recent thing is that they can mimic the voice and put a face to it" (Arash Tavakoli, interview, October 19, 2018). Tavakoli explained that technologies for faking videos of speeches are not perfect yet, but as they improve this will require additional verification. Technologies including artificial intelligence can create serious security and political issues if not used for good. Indeed, digital technologies allow peace mediators to reach a broader data source, but at the same time, false and fabricated information can hamper the process of peace mediation, and the sheer amount of information also challenges the processing capacity of mediators and their tools. Peace mediators in crowdsourcing information need to be aware of the challenges that come along and familiarize themselves with existent verification tools. Reverse image search websites like TinEye or Google Images, and identity verification tools such as AnyWho and AllAreaCodes, are some of the digital forensic techniques can are easy to use and help one recognize fake information (Silverman 2013). Additionally, the reliance on artificial intelligence and big data analysis bears the risk of broadening the scope of the intended information gathering. These technologies have the capacity to sift through vast amounts of data which might in turn only contribute to the "noise," distracting from the central issue rather than providing more valuable insights.

Crisis mapping, mainly taking advantages of geographic information systems (GIS), can be widely applied and can improve data analytics in peace mediators' research of conflicts. GIS technology facilitates peace mediation by providing all parties involved an overview of a particular region of interest, monitoring the movements of populations, and showing historical data of a specific area (Tsendnyam 2016). This information with the aid of GIS technology can prove to be useful in conflict analysis by obtaining situations of people on the ground and local geographic landscape that would otherwise be inaccessible or require other resources. Several UN peacekeeping and political missions have already implemented this technology. Instances are abundant and include the UNAMID mission in Darfur and the UN Cartographic Section, which has been providing geographic visualizations to UN Security Council sessions (Sawaya 2010). From private technology companies, free platforms and tools such as Google Maps and Wikimapia offer peace mediators a promising perspective for leveraging GIS from a "consumer" or "partner" types of role. GIS helps peace mediators with their research and analysis of conflicts by identifying certain areas of interest (Martindale n.d.) and decisions regarding geographical locations. "In other words, GIS can build peace by enabling consensus on how to share space" (GIS4Peace 2017).

Analyzing the technological landscape of the region is also key to selecting the most effective technology for each context. Therefore, it is important to determine Internet access, digital literacy, and the most-used tools and platforms in the area for mediators conducting research and analysis on conflicts. For example, the International Telecommunication Union (ITU) publishes a data visualization called the "Global ICT Development Index" (IDI) as well as an annual "Measuring the Information Society Report" that presents a quantitative analysis of the information

society using a benchmark measure to monitor and compare developments in information and communication technology (ICT) between countries and over time. Consider the screenshot below of some of the IDI statistics on Syria, which show that almost one third of individuals use the Internet. It is important to also consider any censorship of the Internet or specific sites in different countries or any potential government monitoring of digital communication channels. It can also be helpful to research the most popular technology companies and digital and social media tools used in the country to tailor mediators' technology tools to those that make the most sense in specific context, all in all to improve data analytics for mediators. Similar databases and research efforts are also present within other United Nations agencies. For example, the United Nations Office of the Coordination of Humanitarian Affairs (UNOCHA) established a Centre for Humanitarian Data in 2017 in Hague, the Netherlands. Based on services including real-time exchange and use of data, data visualization and reporting, this Centre aims to provide all people involved in humanitarian crises worldwide the necessary information to understand the situation of an affected people and to make informed and responsible decisions. The UN has also launched a number of innovative initiatives that harness cutting-edge technologies for public goods. Some examples are United Nations Global Pulse and UN Peacemaker. United Nations Global Pulse promotes the safe and responsible use of big data, artificial intelligence and other emerging technologies in sustainable development and humanitarian actions. UN Peacemaker is a database that holds extensive documents for peacemaking professionals.

Syria Statistics from ITU's ICT Development Index 2017

Inclusion

Guidance:

- Digital technologies can allow mediators to engage with a broader audience, providing instant communication and access to people in hard-to-reach or besieged areas.
- Risks of digital inclusion include security concerns, the spread of false information, and filter bubbles that limit access.
- Blockchain technologies could provide a secure, transparent means of inclusion.

Mediation processes might face inclusion challenges, often related to the unsuccessful involvement of diverse and underrepresented voices. Digital technologies can help addressing the issue by providing individuals access to information and engagement platforms. This section analyses the use of new technologies to promote inclusivity in contexts such as public consultations and national dialogues.

Digital technologies have been spread worldwide; indeed, mediators find themselves in an increasingly digital environment. However, the phenomenon has not been homogeneous. As it is analyzed in the "World Development Report 2016: Digital Dividends," deep digital dividends, defined as the broader development benefits from the use of such technologies, persist. The benefits of digital technologies are unevenly distributed due to the economic and social inequality in accessing and benefiting from information and communication technologies (ICTs) (World Bank 2016). Thus, such dividends should already be taken into consideration as part of conflict analysis activities when assessing which technologies that can leverage conflict resolution are already in place.

Digital technologies represent an opportunity to engage with a broader audience implementing, for instance, the concept of civil society inclusion in some activities. With this regard, the Civil Society Support Room (CSSR), a room implemented by swisspeace at the Palais des Nations in Geneva that seeks to strengthen the contributions of Syrian civil society actors to the official peace talks (Ammann 2018) represents a good example of inclusion as well as one of the pioneer applications of digital technologies for taking maximum advantage of such engagement with third parties. Including civil society sets a precedent in peace processes that civil society and communities need to be systematically involved in the negotiating process and their inputs should make it past the mediator to the negotiating parties (Mediator, interview, July 27, 2018). However, it is often difficult to bring the representatives of civil society to the negotiation table due to economic or geographic limitations. Thus, inclusion remains a challenge that might be addressed with the use of new technologies. In the case of the Syrian Conflict, the UN Office of the Special Envoy for Syria has held video conferences with refugee communities and people located in hard-to-reach areas and besieged areas. Additionally, they try to have regular Skype and WhatsApp conversations and other video calls with people in these communities, as well as in regional hubs such as in Turkey, Lebanon, and Jordan. With this regard, some risks should be taken into consideration. Indeed, the mediators we spoke to raised many questions related to the protection of contacts on applications such as WhatsApp, Signal or Telegram.

Broader inclusion can be reached through the use of digital technologies in the form of instant messaging applications and social media platforms. During interviews with mediators, we assessed that there has been an inevitable shift in the use of digital technologies as a result of two main factors. First, new technologies often boost opportunities for better and faster communications and collaboration among the members of the mediation team. Second, social media platforms and instant messaging applications represent the most diffuse tools among the parties involved in conflict situations; thus, for mediators, using these platforms is inevitable even despite security considerations. For instance, Line, a Japanese instant messaging application is extremely widespread as means of communication in

Thailand. As a mediator working in Thailand explained, "We [mediators] know that Line is not that safe, but it is still the main tool that people use for communicating" (Jasmin Lutzi, interview, October 26, 2018). While access to ICTs should be considered both in terms of opportunities and in terms of challenges, it is clear instant communication technologies boost opportunities never imaginable twenty years ago; indeed, they are able to complement and implement processes of public consultations and national dialogues.

Box 5: The Thai Public Statement

The Thai Public Statement shows an example of how digital technologies can help involve diverse voices in a political process. In July 2016, the Platform of Concerned Citizens, a civil society network representing all Thais, called upon all the sides of society to stand for a free and fair Charter referendum process and address access to accurate information, the creation for a safe space for dialogue, and the actual understanding of the consequences of the failure of the 7th August 2016 referendum. On April 25, 2016, a group of citizens from different political parties launched the Joint Statement on the Referendum of the Draft Constitution and called upon all sectors in the Thai society to "jointly put into effect a free and fair referendum process in which all sides can exercise their rights constructively and participate in public debates in accordance with the law" (POCC, 2016).

One hundred fifteen people from six different organizations representing all ranges of the socio-political interests of the Thai society supported the statement that resulted in the establishment of the Platform of Concerned Citizens (POCC) working group. "What we tried was working with civil society, academics and political parties as well… All of this was done in a week, maximum two weeks and the use of new technologies such as Line groups, WhatsApp, Line was essential for the success of the mission" (Jasmin Lutzi, interview, October 26, 2018). This shows how digital tools can quickly bring together many people for a common goal.

One of the main challenges of digital inclusion is inevitably related to the security of these communication channels. Mediators tend to relate to these tools with the idea that their communications are tracked and read by third parties. They still have face-to-face meetings with the conflict parties when confidential information is involved. With this regard, it must be noted that a better understanding of the digital tools that are used might help to defuse some of the concerns regarding their security; the safety of such tools is often assumed until proven otherwise, whereas the approach to these tools should be balanced and consider the risks involved.

Another risk related to the use of ICTs, and specifically under the umbrella of social media platforms, can be found in the spread of misinformation. If, on the one hand, social media is featured by an easy-to-use interface and by the possibility to reach all levels of people (from policymakers to people on the ground), some considerations should be kept in mind with regards to the following types of misinformation: unverified information, created information, and fake news spread through these platforms. For example, in Coups d'Etats, after which traditional media are usually no longer trusted by the population due to their strong connection with military administrations, social media platforms such as Facebook might be seen as the medium of correct or real information. However, such information is often not verified, and it might eventually create more hate among people.

A third risk of using digital technologies in inclusion efforts is that private technology companies like Google and Facebook rely on private algorithms that affect access of information by creating "filter bubbles." A "filter bubble" is a "unique universe of information for each of us" formed by algorithms, sets of steps that computer programs follow, that analyze our preferences and behavior online and extrapolate what they think we will like and offer personalized content to each user" (Pariser 2011, 9). Filter bubbles create "echo chambers," which are spaces in which similar ideas reverberate with no access to new ideas, which can contribute to political fragmentation, polarization, and extremism (Sunstein 2001, 2017). In the mediation context, this can mean that some users would be more likely to see and engage with certain content from mediators, limiting inclusion.

Box 6: Blockchain

Interviewees also mentioned the potential application of blockchain in peace mediation. The inherent qualities of blockchain — transparency, decentralization and security — can give all parties on a blockchain access to the entirety of the database and its history and ensures the permanence and irreversibility of records. The openness and the absence of central control in blockchain promotes democratic inclusivity (Iansiti and Lakhani 2017). Any individual and organization could be included in the consultation process, and the final reports and other outputs could be transparent for verification without any intermediary. Information is verified by a multitude of nodes across the globe thus making it extremely difficult to alter and/or obfuscate information. Another element to consider when relying on blockchain technologies is the immutability of content loaded onto the ledger. Information on blockchains is made to stay and be publicly accessible. Therefore, mediators and the mediation parties need to be cautious of what type of information to upload.

In applying blockchain to peace mediation processes, three caveats should be kept in mind. First, the unregulated nature of blockchain requires a trustworthy institution for the source sharing of the information and careful disposal for the protection of sensitive data. Second, the encryption in blockchain systems is shifted from central control to individual level of value transfer records (Iansiti and Lakhani 2017). Third, it is also possible to create private blockchain with private permissions, so it is important to be clear about the realities of the specific blockchain system and what access different users are able to achieve (Maude Morrison, interview, September 12, 2018). When considering applying blockchain to mediation, it is therefore important to consider issues of access and privacy.

Digital Negotiations

Guidance:

- Contact through digital technologies such as instant messaging and teleconferencing can help increase access to stakeholders and reduce intergroup conflict.
- Workflow and file sharing tools on digital platforms can improve collaboration, information sharing, and archiving.
- Considerations to address include cybersecurity issues and the capacity and digital literacy of the mediators and the parties.

The mediation sector is not alone in looking for new ways of enhancing its practices with the help of new technologies. The field of arbitration and the legal sector are also searching for new solutions. Nicolas Leroux cited Loom Analytics' Founder and President Mona Datt "[i]n the legal industry, 2018 will be the year of the symbiosis of man and machine" during a recent conference on Technology in International Arbitration (Young ICCA - ICC YAF Conference 2018). In peace mediation, virtual technologies can add new dimensions to the efforts to reduce conflicts between groups. Not only can these technologies reduce overall negotiation costs by supporting documentation streamlining and content analysis, but they can also help create connections between actors that were previously difficult to establish or maintain due to distance or access through various communication tools.

Therein, the contact hypothesis examined by Guadagno et al. in their article "Peace Data Standard: A Practical and Theoretical Framework for Using Technology to Examine Intergroup Interactions" offers interesting insights into the effects of creating human connections. The contact hypothesis posits that "contact between different groups can reduce intergroup conflict and facilitate positive interactions across group boundaries" (Guadagno et al. 2018, 3). Furthermore, digitally mediated contact, often in the form of video or

teleconferencing or other platforms that allow for engagement, can also serve to reduce intergroup conflict (Guadagno et al. 2018). Several characteristics contribute to this effectiveness: "anonymity, control over the physical exposure, control over the interaction, ease of finding similar others, universal and constant availability and accessibility of the Internet, equality, and fun" (Amichai-Hamburger 2015, 517). "The perception of threat goes way down, and we feel able to be more generous to each other because we are both comfortably in our own contexts" (Mark Nelson, interview, October 3, 2018).

Herein, well-known communication tools such as WhatsApp and Skype offer means of bridging physical gaps and maintaining contact across borders. Both of these applications, among others, offer similar features of messaging, phone calls as well as video conference calls. However, as previously mentioned, some of these tools are free, and data obtained through them might be used by the providers in ways that might endanger privacy and information protection required during the mediation process. It is therefore important to consider paid and/or encrypted alternatives that might be more appropriate for certain stages of the negotiation. While using one of the most commonly used tools might help in the early stages of the process, switching to more secure programs should be taken into consideration. The annex offers a variety of communication alternatives.

Also, software commonly used for online trainings and digital classrooms can be used to make video conference more interactive and beneficial for the parties. Tools such as Adobe's Connect allow users to see the faces of the participants, while including an interface where slides can be seen by all as well as an interactive chat function. These online platforms can also be used to teach parties involved in mediation about the correct, most appropriate use of certain tools given that a crucial element to keep in mind is the literacy and knowledge of the applications. Parties might have different sophistication levels of using technology which can be a source of conflict if not addressed properly (Pratyush Panjwani, interview, November 11, 2018).

Depending on the context, it might be useful to conduct negotiations through ODR platforms because "[s]ome ODR tools such as asynchronous, text-only communication create a space where the emotion associated with traditional face-to-face communication is lost. This can be both a help and a hindrance. The loss of emotional content can place the focus squarely on the issues but may also encourage parties to say things they might say not in person. These results could be advantageous to the mediation—or not, depending on the dispute, the parties, and the particular ICT being used" (Aresty et al. 2015). However, it should be kept in mind that informal face-to-face mediation can create more informal settings in which the involved actors are more prone to good faith concessions which might be conducive to find common agreements and solutions (Pratyush Panswani, interview, November 11, 2018).

"The perception of threat goes way down, and we feel able to be more generous to each other because we are both comfortably in our own contexts." — Mark Nelson

Another, very useful application of technological tools in the mediation field, more specifically for the enhancement of digital negotiations, is the use of workflow and collaboration software, file sharing platforms, and document assemblage tools. Having to work with different stakeholders is essential for the mediation process. Therefore, making sure that all parties have access to the same information or comply with duties that they have committed to during one of the negotiation rounds, such as producing of a specific document for example, can be supported through platforms such as Trello or Asana. These are workflow platforms with integrated communication interfaces, easy-to-use "to do-list" functions in which users can assign each other tasks and upload documents. These platforms are further improving in terms of interoperability so that documents created through Google Drive for example can be referenced in the Asana platform. These tools have the potential to declutter traditional communication channels such as long email chains sent with a multitude of attachments. Information and document sharing can also be further enhanced through the use of File Transfer Protocols (FTPs), better known as file sharing software such as Dropbox, OneDrive, or FileSwap. Users of these programs simply need to save the document they want to share in a specific location in order for it to be shared with all partners with access to the shared folder. Alternatively, mediators can use Virtual Data Rooms (VDRs) to access secure online data repositories, which rely on a series of proprietary networks and usually

provide high levels of confidentiality and security (Beal n.d.).

Related software, such as Luminance or Relativity, are document assemblage tools that rely on artificial intelligence features and allow users to classify vast amounts of documents and data. Originally applied more in the legal sector to sift through documents, these types of tools can help organize information for mediators and conflict parties at the conflict analysis and negotiation stage alike. While there is a risk of flooding negotiations with excessive amounts of information, reliance on these tools might also help in adopting more holistic approaches to certain conflicts. Additionally, other advantages of implementing these tools can be found in terms of archiving and providing transparency of the negotiation processes. While there are current protocols in place for the safekeeping of information about a specific negotiation process, using these electronic sorting mechanisms that allow to classify and consult information in a variety of ways (i.e. keyword searches) might be helpful for future negotiators wanting to compare current trends with solutions that have been adopted in the past.

Notwithstanding the potential for enhancing digital negotiation processes that these tools have, they rely on the premise of connectivity and the continuous availability of these tools. Power outages forced or accidental blackouts, and loss of connectivity infrastructure due to the evolution of certain conflict areas can prove detrimental to the implementation of some of the above-mentioned tools. Another downside arises from the varying levels of digital literacy of the partners and their potential suspicions regarding the safety in using these programs. In wanting to implement certain tools, part of the mediators' work will therefore be the creation and promotion of trust in a certain technology. Mediators will thus have to be most confident and knowledgeable about the technologies they are promoting. Given the varying levels of trust in technology and the use of different tools made by conflict parties, mediators should also be able to adapt to tools that the parties already use and adapt them into the mediation process. In the arbitration field it is already a rather common practice that lawyers implement the technology used by the parties (Pratyush Panjwani, interview, November 11, 2018).

Furthermore, concerns regarding cybersecurity and information leaks will always remain an important element to consider for the implementation of any digital tool in mediation processes. Herein, much insight can be gained from consulting and exchanging best cases with the legal sector given that they have to operate under similar privacy protection and transparency premises.

Public Information and Communication

Guidance:

- Digital technologies can help mediators shape and control the narrative in real time facing a broad audience.
- Mediators can use digital technologies such as social media platforms and sentiment analysis tools to identify influencers and amplify messages.
- Concerns include establishing trust and combatting false information and hate speech.

Public information and communication activities represent a challenging complementary aspect of mediation in terms of shaping and sharing the narrative about specific conflicts or peace efforts to a public audience. Digital tools allow actors to reach the biggest audience possible; however, downside aspects are connected with the difficulties in sticking to the narrative when many parties are involved in the broadcasting of a specific message, as well as the risks of the spread of unverified or false information that could hamper the mediation process.

The Internet and ICTs have changed the way people communicate with each other, and especially the way they get information: new technologies challenge the way people interact with information (Phillips 2015) and how they

express their opinions. When it comes to disruptive technologies, social media take the lead. In terms of communication purposes, social media allow the amplification of messages to the biggest audience possible. This represents an important opportunity, but some considerations should be taken into account. Global organizations such as the UN or other mediation units need to be able to maintain open communication channels with everybody. Social media help in reaching people that are connected, but it is essential to consider those who cannot access these tools as well. As Alessandra Vellucci, Director of the United Nations Information Service, explained, when you are an international organization, you "have to account for everybody", including those who cannot engage in the ways of communicating (Alessandra Vellucci, interview, September 28, 2018). Indeed, Facebook, Twitter and other communication platforms do not necessarily substitute the traditional tools for communication purposes. They rather are modern tools that can potentially complement mediation communication processes (Sarukhan 2015).

To this extent, it would be useful for mediators to identify influencers and most active people on these platforms, who are already connected with a strong and broad audience, in order to engage them or with them in the broadcasting of a specific message. In addition to that, challenges might arise with regards to the maintenance of the same quality throughout the process while adapting to the implementation of additional tools. In this regard, optimizing the posts is a crucial activity that must be taken into consideration when addressing effectivity and efficiency of the public communication activity. Paid marketing campaigns might also be considered. Considering the application of the potential of amplifying the narrative, use of social media for mediation activities might be useful and successful. However, the use of these tools has to be considered according the conflict scenario in place. Indeed, it is important to assess to what extent people have access to new digital ways of engagement; moreover, it is important to train practitioners in understanding the potential and risks of such technologies. "Engaging in social media brings conflict, and it brings peril" (Alec Ross, interview, September 20, 2018).

Communication, transparency and mediation can be considered part of the process of the peace mediation. Thus, social media provides useful tools that are beneficial for the mediators. However, they are not immune to challenges and risks. Parallels could be drawn with regard to the issue of trust. One of the biggest challenges in the use of such platforms is engaging people while making them trust the actor behind the post (Sandre 2015). The Internet, digital tools, and social media platforms have impacted the evolution of all social, economic, political and geopolitical aspects of current society. Channeling these impacts and finding ways to implement these tools into peace mediation has the potential to greatly support the mediator's work following the logic of improved interaction between conflict parties.

Box 7: Communication strategy during the crisis in Yemen

The conflict in Yemen has been defined as a fully man-made conflict. In other words, if men want, they could resolve the situation. Almost the entire country depends on humanitarian support for food. In this regard, the UN communication has focused on humanitarian activities including the health issue due to the destruction of public health infrastructure and the spread of cholera epidemic. It must be noticed that when you are a communicator, you have to be able to communicate the need to have unimpeded access and ensure protection for the most vulnerable. This message is extremely specific and focused on the humanitarian crisis; nonetheless, it connects with a political aspect. For instance, if the humanitarian aid can be distributed only through a port that is closed by a party in the conflict, then there is a barrier on the political aspect. On such aspect, the UN has been communicating on the action of the Special Envoy on Yemen. The latter has briefed has been speaking about the political aspect, raising the issue to the Security Council and has also spoken to the media to broadcast his political activities, whose aim to push the parties to get together back to the negotiation table.

This example shows two different communication strategies on how public institutions can re-share their statements and positions. Communication strategies depend on the purposes of the institution broadcasting a specific message. Traditional approaches such as press conferences remain largely used, however, new technologies such as instant messaging have largely been introduced among journalists and facilitated the communications.

Recommendations

Our findings suggest that public-private engagement between technology companies and mediation units or organizations should follow a structured practice. Looking at the experience of existing structures and bodies of international organizations, a standard procedure for the engagement with private companies should respect the following guidelines.

First, the collaboration should happen for the only purpose of implementing the tools already in use by mediators or the parties or eventually creating new technologies that meet the specific needs of the mediation environment in terms of confidentiality and adaptability.

Second, the engagement, at all levels, should be open, transparent and inclusive. Engaging in a collaboration with mediation unit would not characterize a competitive advantage for the firms. More than economic profits, eventually discussed and negotiated before establishing the partnership, the firm would take advantage of the cascading benefits of the business of peace. All business should be able to reach to peace mediation entities to have an initial conversation about a potential partnership. To this extent, a focal point should be identified as the person whom representatives from technology companies can refer to start a dialogue, evaluate the layers of engagement and potentially submit a formal request on which negotiating the terms of reference of the collaboration.

Third, the willingness of political mediation entities to explore partnerships with the private sector could be publicized through the creation of conferences or events in which experts from the private technology sector, academia and research institutes are invited, or through the creation of ad hoc working groups with the mandate of exploring the collaboration or existing frameworks already in place within a specific organization. For instance, the Security Improvements through research, technology and innovation (SIRIO) project run by the United Nations Interregional Crime and Justice Research Institute (UNICRI) in collaboration with the private sector could represent a good opportunity for engagement.

Box 8: Questions to Ask When Engaging Private Technology Companies

- Is the tool used in the specific context?
- Can the tool be adapted to the local context?
- Who owns the tool?
- Why is the company interested in partnering?
- What is the cost of the tool?
- What is the source of the information for the tool?
- Who owns the data collected from the tool?
- How is data stored?
- Does the tool use encryption?
- Does the tool use open source?
- What is the desired time frame for the use of the tool or partnership?
- How will the mediator and company communicate the partnership to the negotiation parties and the public?
- What is the company's privacy policy?
- What similar work has the company done in the past?
- How much time and work will the partnership require of mediators?

Conclusion

This report explored the role of private technology companies in peace mediation in an effort to support the work of the CyberMediation Initiative. Using an extensive literature review and elite interviews, we analyzed the potential benefits and downside risks of private sector involvement in the various aspects of peace mediation. We used these lessons to develop a framework for how mediators can best cooperate with private sector technology companies and apply digital tools in peace mediation activities.

First, we examined the needs of peace mediators, which entailed getting a solid understanding of the phases and actors the involved in the mediation context, as well as the parties' digital literacy levels, access to technology, and capacity for incorporating digital tools in their work. Therein, we saw that the position of mediators requires substantial amounts of creativity to solve highly complex issues, and so we strongly support the idea that technological applications can help to enhance mediators' work but that it cannot solve issues by itself. Also, given that mediators rely heavily on the attributes of credibility and trust, it is essential that technology does not endanger that position. Additionally, it is important to recognize that technological solutions are not a solution in and of themselves; they must fit different situational and regional context given the incalculable variables of each specific case. The understanding of the specific context and the tools that can be and should or shouldn't be used will have to become an essential consideration at every stage of the mediation process.

Second, we analyzed ways of engagement for private technology companies and found that in engaging with the private sector, mediators must assess and determine the level of engagement with the technology offer — free user, consumer, and partner — and what advantages or disadvantages each level has. "Free user" technology might be off the shelf and readily available and represent a good way to create wider engagement with the technology, but it might come at the cost of privacy or data control. It might also be interesting to look into existing public-private partnership models in order to support certain aspects of the mediation process. Another important step for the engagement with the private sector is the establishment of shared strategies with the partners. It is essential to align the different cultures and ways of working in order to come up with a common set of priorities and expectations. Herein, mediators must also be aware of the potential risk and downsides to partnerships. Hidden agendas, differing interests, market dynamics or lack of awareness and expertise in the mediation field have the potential to disrupt the process and cause more harm than good.

Finally, we looked at possible applications of specific technological tools to peace mediation. In using the framework for applying private sector technology to mediation based on the categories of mediation provided by the CyberMediation Initiative partners: conflict analysis, inclusion, digital negotiations, and public information and communications, we found that different type of tools can be applied to each of the categories. For example, conflict analysis can greatly benefit from GIS technology, while digital negotiations can be enhanced through a variety of workflow and file sharing applications. Inclusivity can be enhanced through greater transparency mechanisms such as social media and blockchain whereas public information and communication can be enhanced not only through social media but other, more targeted communication software as well. In the Annex, we take this analysis a step further to propose a non-exhaustive list of potential private technology companies and tools, organized by category, that could contribute to peace mediation.

When looking at the use of technology and the involvement of private technology companies in peace mediation processes, it is important to keep in mind that not all tools will have the same effect on the different cases. Therefore, finding the right balance of tools and knowing their implications is essential. This preliminary work aims at identifying promising avenues for the use of digital tools in peace mediation. We hope this report provides a useful overview and structure for mediators interested in incorporating the offerings of private technology companies in their work.

Annex I: CyberMediation Dashboard: Digital Tools for Peace Mediation

This annex offers brief descriptions of technological categories and a non-exhaustive list of tools that could be applied in case-specific circumstances to the mediation process. This report does not provide cost-benefit analysis of the tools mentioned in this study, as these are elements that require extensive negotiations with technology partners and of which the results in terms of return of investment can only be analyzed after a tentative implementation phase. A more interactive visualization of the below listed information is attached to this report: "CyberMediation Dashboard: Digital Tools for Peace Mediation." The dashboard represents an alternative way of visualizing the information provided in this annex by filtering it by mediation categories, technological categories. Moreover, it will provide working definitions for the technological categories as follow.

Instant Messaging

The exchange of real-time messages through an application or software.

Social Media

Network platforms that allow users to create content, share content, and communicate.

Blockchain

Distributed and decentralized ledger technology used to record and store data.

Cloud Service

Services stored on servers and available on demand from anywhere.

Workflow

Infrastructure for the set-up, performance, and monitoring of tasks.

Sentiment Analysis

The identification and categorization of opinions expressed on digital platforms

Data Visualization

Tools that enable the visual presentation of information.

File Sharing

Practice of distributing or providing access to digitally stored information.

Teleconferencing

The use of digital devices to hold discussions among participants.

Geographic Information System (GIS)

Systems that capture, store, analyze, manage, and present spatial and/or geographic data.

Data Analytics

Process of gathering, extracting and analyzing a large amount of unstructured data

Tools	Company	Tech Category	Mediation Category
Aid:Tech	Aid: Tech	Blockchain	Inclusion
Bitfury	Bitfury Group	Blockchain	Inclusion
Bitnation	Bitnation	Blockchain	Inclusion
Blockstack	Blockstack	Blockchain	Inclusion
Civic	Civic Technologies, Inc.	Blockchain	Inclusion
ID2020	Identity2020 Systems, Inc	Blockchain	Inclusion
iCloud	Apple	Cloud Services	Digital Negotiation
Alibaba Cloud	Alibaba	Cloud Services	Digital Negotiation
Baidu Wangpan	Baidu	Cloud Services	Digital Negotiation

Google Drive	Google	Cloud Services	Digital Negotiation
OneDrive	Microsoft	Cloud Services	Digital Negotiation
ownCloud	ownCloud	Cloud Services	Digital Negotiation
Zendesk	Zendesk	Cloud Services, Workflow	Digital Negotiation
Penthao	Hitachi Vantara	Data Analyitics	Conflict Analysis
Content Grapper	Content Grabber	Data Analyitics	Conflict Analysis
Marketo	Adobe	Data Analyitics	Conflict Analysis
Mozenda	Mozenda	Data Analyitics	Conflict Analysis
Octoparse	Octopus Data	Data Analyitics	Conflict Analysis
OpenRefine	OpenRefine Project	Data Analyitics	Conflict Analysis
Opentext	OpenText	Data Analyitics	Conflict Analysis
Orange	University of Ljubljana	Data Analyitics	Conflict Analysis
Parsehub	ParseHub	Data Analyitics	Conflict Analysis
Qlik	Qlik	Data Analyitics	Conflict Analysis
R-Programming	R Foundation	Data Analyitics	Conflict Analysis
Solver	FrontlineSolver	Data Analyitics	Conflict Analysis
Talend	Talend	Data Analyitics	Conflict Analysis
Meltwater	Meltwater	Data Analytics, Sentiment Analysis	Conflict Analysis
Datawrapper	Datawrapper	Data Visualization	Conflict Analysis, Digital Negotiations, Public Information and Communication
Gephi	Gephi Consortium	Data Visualization	Conflict Analysis, Digital Negotiations, Public Information and Communication
Google Analytics	Google	Data Visualization	Conflict Analysis, Digital Negotiations, Public Information and Communication
Import.io	Import.io	Data Visualization	Conflict Analysis, Digital Negotiations, Public Information and Communication
Infogam	Infogam	Data Visualization	Conflict Analysis, Digital Negotiations, Public Information and Communication
KeyNote	Apple	Data Visualization	Conflict Analysis, Digital Negotiations, Public Information and Communication
NodeXL	Social Media Research Foundation	Data Visualization	Conflict Analysis, Digital Negotiations, Public Information and Communication

Powerpoint	Microsoft	Data Visualization	Conflict Analysis, Digital Negotiations, Public Information and Communication
Prezi	Prezi	Data Visualization	Conflict Analysis, Digital Negotiations, Public Information and Communication
Tableau Public	Tableau	Data Visualization	Conflict Analysis, Digital Negotiations, Public Information and Communication
Wix	Wix	Data Visualization	Conflict Analysis, Digital Negotiations, Public Information and Communication
Wordpress	Automattic	Data Visualization	Conflict Analysis, Digital Negotiations, Public Information and Communication
Adobe Connect	Adobe	Data Visualization, Teleconferencing	Conflict Analysis, Digital Negotiations, Public Information and Communication
AjaXplorer	Pydio	File Sharing	Digital Negotiation
Dealroom	Dealroom	File Sharing	Digital Negotiation
Dropbox	Dropbox Inc.	File Sharing	Digital Negotiation
Firedrive	Filedrive	File Sharing	Digital Negotiation
Firmroom	Filmroom	File Sharing	Digital Negotiation
Knive	Open Source on GitHub	File Sharing	Digital Negotiation
Knovos	Knovos, LLC	File Sharing	Digital Negotiation
NetCase	NetCase	File Sharing	Digital Negotiation
WeTransfer	WeTransfer	File Sharing	Digital Negotiation
Instagram	Facebook	File Sharing, Instant Messaging, Teleconferencing,	Conflict Analysis, Inclusion, Digital Negotiations, Public Information and Communication
Factr	Factr	File Sharing, Workflow	Digital Negotiation
ArcGIS	esri	GIS	Conflict Analysis
Baidu Maps	Baidu	GIS	Conflict Analysis
ET GeoWizards	ET Spatial Techniques	GIS	Conflict Analysis
Google Maps	Google	GIS	Conflict Analysis
Liveuamap	Liveuamap	GIS	Conflict Analysis
MapX	Lexalytic	GIS	Conflict Analysis
OpenStreetMap	OpenStreetMap	GIS	Conflict Analysis
Predata	Predata	GIS	Conflict Analysis

QGIS	QGIS	GIS	Conflict Analysis
Frontline SMS	Frontline	Instant Messaging	Conflict Analysis, Inclusion, Digital Negotiations, Public Information and Communication
iMessage	Apple	Instant Messaging	Conflict Analysis, Inclusion, Digital Negotiations, Public Information and Communication
Kakaotalk	Kakao	Instant Messaging	Conflict Analysis, Inclusion, Digital Negotiations, Public Information and Communication
Line	Line	Instant Messaging	Conflict Analysis, Inclusion, Digital Negotiations, Public Information and Communication
Messenger	Facebook	Instant Messaging	Conflict Analysis, Inclusion, Digital Negotiations, Public Information and Communication
ProtonMail	ProtonMail	Instant Messaging	Conflict Analysis, Inclusion, Digital Negotiations, Public Information and Communication
Signal	Signal Messenger	Instant Messaging	Conflict Analysis, Inclusion, Digital Negotiations, Public Information and Communication
Slack	Slack	Instant Messaging	Conflict Analysis, Inclusion, Digital Negotiations, Public Information and Communication
Telegram	Telegram	Instant Messaging	Conflict Analysis, Inclusion, Digital Negotiations, Public Information and Communication
Tutanota	Tutanota	Instant Messaging	Conflict Analysis, Inclusion, Digital Negotiations, Public Information and Communication
Viber	Rakuten	Instant Messaging	Conflict Analysis, Inclusion, Digital Negotiations, Public Information and Communication
Wire	Wire Swiss GmbH	Instant Messaging, File Sharing, teleconferencing	Conflict Analysis, Inclusion, Digital Negotiations, Public Information and Communication
WhatsApp	Facebook	Instant Messaging, Teleconferencing	Conflict Analysis, Inclusion, Digital Negotiations, Public Information and Communication
CrowdTangle	Facebook	Sentiment Analysis	Conflict Analysis
Opinion Crawl	Semantic Engines LLC.	Sentiment Analysis	Conflict Analysis
SAS Sentiment Analysis	SAS Institute	Sentiment Analysis	Conflict Analysis
Semantria	Lexalytics	Sentiment Analysis	Conflict Analysis

Trackur	Trackur	Sentiment Analysis	Conflict Analysis
Buffer	Buffer	Social Media	Conflict Analysis, Inclusion, Digital Negotiations, Public Information and Communication
BuzzSumo	Brandwatch	Social Media	Conflict Analysis, Inclusion, Digital Negotiations, Public Information and Communication
CrowdTangle	Facebook	Social Media	Conflict Analysis, Inclusion, Digital Negotiations, Public Information and Communication
Facebook	Facebook	Social Media	Conflict Analysis, Inclusion, Digital Negotiations, Public Information and Communication
Flickr	SmugMug	Social Media	Conflict Analysis, Inclusion, Digital Negotiations, Public Information and Communication
Hootsuite	Hootsuite	Social Media	Conflict Analysis, Inclusion, Digital Negotiations, Public Information and Communication
Rebel Mouse	Rebel Mouse	Social Media	Conflict Analysis, Inclusion, Digital Negotiations, Public Information and Communication
Social Flow	Social Flow	Social Media	Conflict Analysis, Inclusion, Digital Negotiations, Public Information and Communication
Social Studio	Salesforce	Social Media	Conflict Analysis, Inclusion, Digital Negotiations, Public Information and Communication
Sysmosos	Sysmosos	Social Media	Conflict Analysis, Inclusion, Digital Negotiations, Public Information and Communication
Tweetdeck	Twitter	Social Media	Conflict Analysis, Inclusion, Digital Negotiations, Public Information and Communication
YouTube	Google	Social Media	Conflict Analysis, Inclusion, Digital Negotiations, Public Information and Communication
Feedly	Feedly	Social Media, Cloud Services, Data Visualization	Conflict Analysis, Inclusion, Digital Negotiations, Public Information and Communication
Wechat	Tencent	Social Media, Instant Messaging, File Sharing, Teleconferencing	Conflict Analysis, Inclusion, Digital Negotiations, Public Information and Communication
Twitter	Twitter	Social Media, Instant Messaging, Sentiment Analysis	Conflict Analysis, Inclusion, Digital Negotiations, Public Information and Communication

Crimson Hexagon	Crimson Hexagon	Social Media, Sentiment Analysis	Conflict Analysis, Inclusion, Digital Negotiations, Public Information and Communication
Sprout Social	Sprout Social	Social Media, Sentiment Analysis	Conflict Analysis, Inclusion, Digital Negotiations, Public Information and Communication
Storyful	Storyful	Social Media, Sentiment Analysis	Conflict Analysis, Inclusion, Digital Negotiations, Public Information and Communication
Talkwalker	Marlin Equity Partners	Social Media, Sentiment Analysis	Conflict Analysis, Inclusion, Digital Negotiations, Public Information and Communication
Tumblr	Yahoo	Social Media, Data Visualization	Conflict Analysis, Digital Negotiations, Public Information and Communication
ClickMeeting	ClickMeeting	Teleconferencing	Digital Negotiation
Facetime	Apple	Teleconferencing	Digital Negotiation
Google Hangouts	Google	Teleconferencing	Digital Negotiation
Moti Chat	Moti	Teleconferencing	Digital Negotiation
Skype	Microsoft	Teleconferencing	Digital Negotiation
TrueConf	TrueConf	Teleconferencing	Digital Negotiation
Webex Calling	CISCO	Teleconferencing	Digital Negotiation
Webex Meetings	CISCO	Teleconferencing	Digital Negotiation
Zoom	Zoom Video Communications, Inc.	Teleconferencing	Digital Negotiation
Webex Teams	CISCO	Teleconferencing, Workflow	Digital Negotiation
Asana	Asana	Workflow	Digital Negotiation
Brikit	Brikit	Workflow	Digital Negotiation
Doodle	Doodle	Workflow	Digital Negotiation
Evernote	Evernote	Workflow	Digital Negotiation
Jira	Atlassian	Workflow	Digital Negotiation
Trello	Trello	Workflow	Digital Negotiation
Wunderlist	Microsoft	Workflow	Digital Negotiation

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