

Office of the Special Representative and Co-ordinator
for Combating Trafficking in Human Beings

Tech Against Trafficking

Leveraging innovation to fight trafficking in human beings: A comprehensive analysis of technology tools



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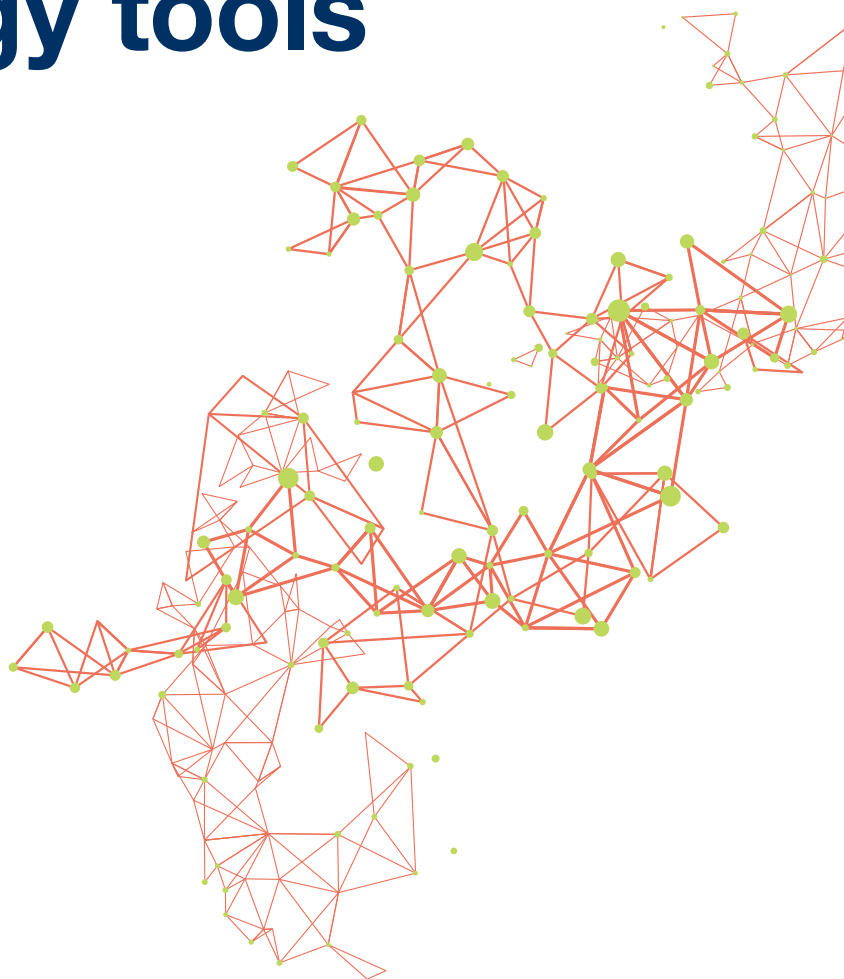
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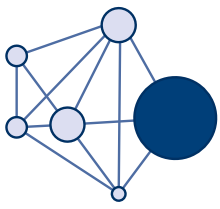
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Leveraging innovation to fight trafficking in human beings: A comprehensive analysis of technology tools





Foreword

Combating trafficking in human beings (THB) is a complex and difficult task, made even more challenging by the persistent evolution of the business models used by traffickers. The Organization for Security and Co-operation in Europe (OSCE) participating States — and the agencies, organizations and individuals within them — face many hurdles in their efforts to combat THB. However, many anti-trafficking stakeholders recognize that the scale of THB with an estimated 24.9 million victims globally, is one of the biggest challenges facing the field. In short, we will not be successful at ending THB unless we find a way to address the enormous scale of the problem.

Efficient and effective solutions to combat THB, including its scale, require the combination of various factors, which together could generate the desired impact. The OSCE and Tech Against Trafficking, as the authors of this publication, believe that technology is a critical factor in our collective success, and should be a fundamental component of any strategy to address THB.

“Leveraging innovation to fight trafficking in human beings: A comprehensive analysis of technology tools” is a ground-breaking effort to take stock of the current landscape of technology tools used to combat THB, within and outside the OSCE region, including their source, purpose and audience. We believe this will aid anti-THB stakeholders by helping OSCE participating States to engage with technology strategically and by raising awareness about tools to help their work and inspiring them to pursue future innovation

This publication represents the first time the Office of the OSCE Special Representative and Co-ordinator for Combating Trafficking in Human Beings (OSR-CTHB) has partnered with a private sector initiative to conduct research on a topic related to combating THB. The partnership has benefited both the OSCE and Tech Against Trafficking, which have mutually enjoyed and leveraged their knowledge and expertise in order to multiply their efforts to tackle THB. This collaborative approach should be encouraged and adopted by other organizations, especially in the field of technology to combat human trafficking, where knowledge and expertise is spread across sectors.

Trafficking in human beings is a crime with implications that affect all of society, including the public and private sectors, and civil society. In recognition of the expansive impact of trafficking, this publication is intended for use by a wide range of stakeholders including law enforcement, policymakers, public service providers, NGOs, private sector companies, survivors’ communities and the general public. It provides information about different technical solutions which can be used by stakeholders in a variety of situations to combat human trafficking. For example, law enforcement can learn about tech tools that can assist in identifying victims and traffickers. Policymakers can learn about what data aggregation and analysis technologies are used to analyse human trafficking marketplaces and the impact of legislation. Survivors can acquire information about tools to seek support and gain access to services.

We hope that this publication will prove to be particularly useful during these challenging times when the entire global community is fighting the SARS-CoV-2 virus. Most governments around the world, including in the OSCE area, have taken social distancing measures and as a result, hundreds of millions of people are limited in their movement. With adults staying home, in search of new livelihood opportunities, and spending more time online, there is an opportunity for traffickers to increase their illegal profits from online sexual abuse of trafficking victims, especially children. Likewise, out-of-school children are spending more time online, children whose parents might not be familiar with the Internet resources their children are using and might not have the time to monitor their children’s online activities. This lack of oversight and knowledge creates an unprecedented opportunity for an increase in grooming and online enticement. Moreover, during lockdown, victims of domestic servitude are trapped with their abusers; technology might be the only means to report such cases. In this regard, this publication provides information about technology tools which can be useful in the prevention and combating of Internet-facilitated human trafficking cases.

Trafficking in human beings and technology are constantly changing and evolving. Traffickers are always improving their *modus operandi* and looking for new opportunities to increase their criminal proceeds. The technology sector is also one of the most innovative industries where new developments happen at an exceedingly fast pace. There-

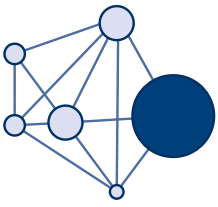
fore, the OSCE and Tech Against Trafficking fully acknowledge that some of the outcomes of the research highlighted in this publication might be obsolete in the near future. As a result, the aim is also to encourage close monitoring both of how traffickers are misusing technology for their own interests and of new initiatives to leverage technology to combat trafficking in human beings.

We hope readers will enjoy this publication and embrace technology as one of the most important assets in our common endeavour to win the fight against trafficking in human beings.

A handwritten signature in blue ink, appearing to read 'Valiant Richey', with a stylized, flowing script.

Valiant Richey
OSCE Special Representative and Co-ordinator for Combating Trafficking in Human Beings

Tech Against Trafficking Coalition



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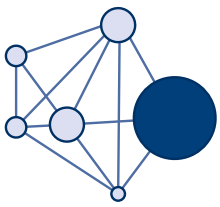
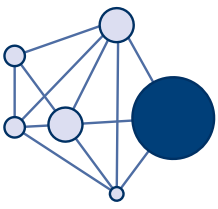


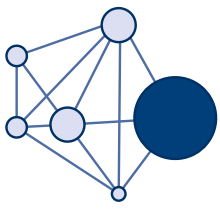
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Acronyms

AI	artificial intelligence
CDM	Centro de los Derechos del Migrante
CSEC	commercial sexual exploitation of children
CTHB	combating trafficking in human beings
DARPA	U.S. Defense Advanced Research Projects Agency
DRC	Democratic Republic of the Congo
ESG	environmental, social, and governance
GPS	Global Positioning System
ICAT	Inter-Agency Coordination Group against Trafficking in Persons
ICT	information and communication technology
IGO	intergovernmental organization
ILO	International Labour Organization
IOM	International Organization for Migration
ITUC	International Trade Union Confederation
IVR	interactive voice response
MENA	Middle East and North Africa
NCMEC	National Center for Missing and Exploited Children
NGO	non-governmental organization
NORC	National Opinion Research Center
OSCE	Organization for Security and Co-operation in Europe
OSINT	open source intelligence
OSR-CTHB	Office of the OSCE Special Representative and Co-ordinator for Combating Trafficking in Human Beings
SMS	short message service
STOP	the Sex Trafficking Operations Portal
TAT	Tech Against Trafficking
TIP	trafficking in persons
THB	trafficking in human beings
UN	United Nations
USAID	United States Agency for International Development
UNGC	United Nations Global Compact
UN.GIFT	United Nations Global Initiative to Fight Human Trafficking
UNODC	United Nations Office on Drugs and Crime
USAID	United States Agency for International Development
USBA	United States Banks Alliance Against Human Trafficking
U.S. DOJ	United States Department of Justice



Executive Summary

Trafficking in human beings is a widespread and highly profitable crime. According to some reports, human trafficking is the third-largest criminal activity in the world, behind drug trafficking and counterfeiting.¹ With low costs and sizeable profits to be made, traffickers have a strong incentive to remain involved in this heinous crime

At the same time, the risk to human traffickers of being identified, prosecuted and sentenced is very low. In fact, between 2015 and 2018, the global prosecution rate of traffickers decreased by 42%; in Europe it decreased by a staggering 52%.² By all accounts, human traffickers operate with impunity and there is little resistance from the systems that are in place to bring them to justice.

The large divide between the high profitability of trafficking in human beings and the impunity of criminals has increased even more because of the misuse of technology by human traffickers. Perpetrators and their associates are using technology in many stages of the human trafficking crime, including recruitment, movement, control, advertising³ and exploitation of victims. There are numerous benefits from technology that perpetrators take advantage of, from instant and secure communication among members of a trafficking ring, to remote control of victims using GPS location apps, or receiving and moving criminal proceeds using cryptocurrency.

While human traffickers are becoming more tech-savvy and are able to use technology successfully to their advantage, the same is not necessarily true of actors responsible for combating trafficking in human beings. Some attention has been put on how to investigate technology-enabled human trafficking as a cybercrime, especially obtaining digital evidence. However, much less attention is paid — and resources allocated — to how technology can serve as a force multiplier and be used in positive ways to combat trafficking in human beings, especially in the prevention and protection contexts.

Although some good examples exist in the OSCE area and beyond on the use of technology by law enforce-

ment, civil society and the private sector to combat human trafficking, unfortunately the number and the scale of technology initiatives and tools do not match the size of the problem. Moreover, there is limited awareness about existing technology initiatives in the anti-trafficking field, which increases the risk of fragmented and disjointed development and use of technology-based tools. Since the development of tech solutions can be a long process and requires allocation of important financial and human resources, it is extremely important that stakeholders are aware about the existing technology tools in the anti-trafficking field in order to avoid duplication of efforts.

The OSCE participating States have repeatedly expressed their strong commitment to use technology to combat human trafficking. For example, the 2013 Addendum to the OSCE Action Plan to Combat Trafficking in Human Beings recommends “[t]aking measures, where appropriate, to enhance capacities for monitoring, detecting, investigating and disrupting all forms of trafficking in human beings facilitated by ICTs, in particular by the Internet, including trafficking for sexual exploitation”. Moreover, the 2017 OSCE Ministerial Council Decision 7/17 “[e]ncourages participating States to call on information and communication technologies and social media companies to prevent the distribution of and take down child sexual abuse content online, and to protect children by combating grooming by human traffickers online for all forms of child trafficking as well as other sexual exploitation of children, including through the development of new tools and technologies”.

In line with these pronouncements, this publication seeks to address the current information gap in the OSCE area and beyond about the use of technology to combat trafficking in human beings and to empower anti-trafficking stakeholders with knowledge and information which could be useful in leveraging the power of technology to fight the exploitation of people.

The publication takes stock of technology tools and initiatives developed to combat trafficking in human beings in its different forms in the OSCE area and

¹ The U.N. estimated the total value of human trafficking at \$150 billion (See ILO, Profits and Poverty: *The Economics of Forced Labour* (Geneva: ILO, 20 May 2014), p. 13). The comparable estimates for the drug trade range from about \$426 billion to \$652 billion (See Channing May, “Transnational crime and the developing world”, Global Financial Integrity (Washington D.C., March 2017)). The estimate for counterfeiting is \$250 billion (See Organization for Economic Cooperation and Development, *Magnitude of counterfeiting and piracy of tangible products: an update* (November 2009)). Also, see U.S. DOJ, “Assistant Attorney General Williams Delivers Remarks on the Department’s Efforts to Fight Human Trafficking” [website] (U.S. DOJ, 23 March 2018). Available at: www.justice.gov/olp/speech/assistant-attorney-general-williams-delivers-remarks-department-s-efforts-fight-human (accessed 8 May 2020).

² According to data from the 2019 U.S. Trafficking in Persons report.

³ The term “advertising of human trafficking victims” used in this publication refers to the placement of information on public or private online platforms about certain services delivered for payment, such as escort and sexual services, massage, dancing etc. Traffickers usually do not advertise human trafficking victims *per se*, but create the appearance of services being delivered willingly by the victim.

beyond. It is the first known publication to conduct a global analysis of how different stakeholders, including law enforcement, civil society, businesses and academia can take advantage of technology to advance the fight against the human trafficking crime. It also provides recommendations to governments and organizations funding technology projects on how to maximize the value of technology-based solutions.

The report is comprised of six chapters. **The first chapter** summarizes how technology is being misused by human traffickers for their own advantage. The analysis highlights that the misuse of technology enables perpetrators to increase the size and profitability of the human trafficking market; turn vulnerable individuals into victims; exert control and influence over victims and facilitate illicit financial flows.

Particular attention is paid to the role of technology in increasing the size and profitability of the human trafficking market, which can occur in a variety of ways. Technology creates new “business opportunities” by enabling the delivery of new types of “services” such as live streaming of sexual exploitation, including of child sexual abuse, to a global audience. It increases access of traffickers to a larger market and it reduces the risk of being identified and caught by law enforcement.

Chapter 2 concentrates on mapping existing technology tools used by different stakeholders to combat human trafficking. More specifically, this chapter analyses 305 technology initiatives identified by this publication focusing on combating human trafficking. The technology-based tools described in this chapter are classified into the following areas:

1. Victim/Trafficker Identification
2. Awareness-raising, Education, Collaboration
3. Supply Chain Management
4. Data Trends and Mapping
5. Corporate Risk Identification
6. Worker Engagement and Empowerment
7. Victim Case Management and Support
8. Ethical Shopping
9. Privacy/Personal Identity
10. Payment Security
11. Other

The results of the research reveal that the majority of tools are aimed at countering trafficking for labour and sexual exploitation. English remains the most widely used language - almost half of the tools are only available in English. Tools are also available in Spanish, French, and Chinese.

The majority of the tools identified (56%) were global in nature, while 44% were regional tools. Among the tools

identified, more than a quarter were introduced to identify victims of trafficking or perpetrators of trafficking. Two-thirds of the tools have been developed for various preventive and other purposes, such as awareness raising, supply chain management, or worker engagement and empowerment. However, tools such as those focusing on victim case management and support, which assist victims in their reintegration phase after having been exploited, account for only 6% of all the tools.

Businesses account for a fifth of the tools’ total target users; NGOs and law enforcement make up another quarter of users, as do victims and potential victims.⁴ Of the 305 tech tools identified, almost half are available for free and one third are subscribed to for a fee.

An important finding of this chapter is that private sector companies and NGOs are leading the way in the development of technology tools to fight trafficking, accounting for 40% and 33% of development respectively. Governments developed only 9% of technology tools and initiatives identified by this publication. The chapter concludes by listing the key takeaways of the analysis of the 305 technology tools.

Building upon the findings of the second chapter, **Chapter 3** of the publication takes a deeper dive into the eleven categories of tools identified and explores what the tools seek to accomplish within those areas by discussing the objective(s) they aim to achieve and categorizes the objectives as follows:

- ✓ Dissemination of information;
- ✓ Removing opportunities for exploitation;
- ✓ Identification of victims;
- ✓ Collecting publicly available information to combat human trafficking;
- ✓ Assessing risks of trafficking;
- ✓ Proactive monitoring of situations where people may be at risk of exploitation;
- ✓ Identifying and acting on typologies.

The chapter also provides examples of how different anti-trafficking organizations use technology tools in their day-to-day work.

Chapter 4 discusses ethical considerations and data protection. Organizations involved in combating trafficking in human beings may possess or have access to sensitive information and data. For example, law enforcement authorities gather personal data on victims of human trafficking, perpetrators and other persons relevant for investigations; NGOs possess data about victims or presumed victims of human trafficking and information about the circumstances of their exploitative situation. Chapter 4 highlights that it is extremely important to protect data and information

⁴ The term “potential victims” is used to denote individuals from vulnerable groups who may become victims of trafficking in human beings.

from unauthorized access because it can endanger the victim's safety and increase psychological trauma.

It also advocates for the establishment of consent protocols with survivors and victims of trafficking who share their data with researchers. Protection mechanisms have to be put in place to ensure that any data, especially information that allows personal identification, is stored securely and that only authorized persons have access to it. The chapter also highlights that there is a need to prevent the use of technology tools for obtaining data from victims and vulnerable people for extractive purposes only, rather than to address the complaints and grievances of individuals vulnerable to human trafficking. In addition, this chapter underlines the need to use technology tools in the context of a broader human rights framework in order to ensure that these tools are not used for actions which would violate human rights, such as mass surveillance of the population or mass collection of personal data, especially of vulnerable groups including undocumented migrant workers.

Chapter 5 discusses the conclusions that have emerged from the analysis in this publication. For example, one of the conclusions, which is applicable to different areas and not exclusive to trafficking in human beings, is that technology is a double-edged sword. Traffickers can use technological progress for their own advantage and, at the same time, law enforcement authorities, civil society and businesses can leverage it to combat human trafficking.

This chapter highlights the importance of multi-sectoral collaboration, which provides an optimal framework to leverage multiple sources of expertise and, at the same time, acknowledges the importance of governments which can adopt the necessary policies to create an enabling environment to leverage technology to combat human trafficking.

Finally, the chapter addresses the need to move beyond pilot projects and to understand the displacement effect: stakeholders engaged in this field have to move beyond the cycle of developing and piloting new initiatives, and toward expanding the coverage of those existing initiatives that are showing results. However, they also have to take into account that criminals respond to attempts to curtail their activities by changing their location and/or *modus operandi*; as soon as law enforcement find ways to combat trafficking, traffickers look for new ways to evade them. This is also the case in the context of technology and trafficking in human beings.

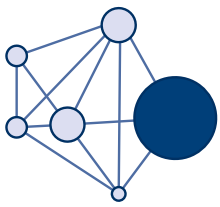
Finally, Chapter 6 provides a set of general recommendations for all actors involved in the use of tech-

nology to combat trafficking, and a more specific set of recommendations for governments. It underlines that limits exist on what technology can do and that practitioners should manage their expectations of how much technology can "solve".

The general recommendations discuss the need to be clear about the purpose of the technology-based solutions and why such solutions are preferable to alternatives, as well as the need to ensure that these solutions are fit for the purpose, taking into account issues regarding access, coverage and literacy. When developing tech solutions, organizations should align them with other initiatives and consider whether a suitable application is already available before developing a new one. Technology tools for combating THB should keep up with developments in both technology and the human trafficking context. Most importantly, developers should test assumptions and measure outcomes to ensure that the desired impact is achieved.

Recommendations for governments include the need to adopt policies and legislation that would curb the misuse of technology and incentivize the positive use of tech tools to combat human trafficking. Furthermore, governments should increase resources for entities entrusted with identifying trafficking cases in order to invest in technology-based solutions to better support victims and end trafficking in human beings. Governments are also advised to expand partnerships with tech companies and businesses to invest in research and development and incentivize scaling of technology tools in this field.

The list of 305 technology initiatives addressing trafficking in human beings identified by this research is presented in Annex 1 of the publication. Although most technology tools and initiatives referenced here originate from North America and Europe where organizations are most active, this publication intends to focus on the OSCE region as a whole.



Introduction

A November 2018 headline on CNN World reads, “*Child bride auctioned on Facebook in ‘barbaric use of technology’*.” The article describes how a family in South Sudan conducted an auction on the social media platform for their 16-year-old daughter, seeking a dowry “for her hand in marriage”. Although Facebook eventually took down the post, the girl had already been auctioned. The article quotes the NGO Plan International stating, “[t]his barbaric use of technology is reminiscent of latter-day slave markets.”⁵

In contrast, the University of Nottingham’s Rights Lab uses technology to identify locations where workers may be enslaved and to target on the ground interventions. Rights Lab has partnered with Planet Labs,⁶ a company employing satellites to image the entire planet on a daily basis. Together they identified 55,000 brick kilns in South Asia, a type of location known for exploiting trafficking victims for their labour.⁷ The U.S.-based NGO Thorn is also using innovative technology to identify trafficking victims, especially children. Using a tool called Spotlight, in the last three years Thorn has helped identify over 9,380 child victims of sex trafficking advertised for sex services on different online platforms and has also helped law enforcement officials in the U.S. and Canada identify nearly 11,000 traffickers. This is an average of eight child sex trafficking victims identified every day.⁸

As shown by these examples, on one hand technology is being used to facilitate the crime of human trafficking; on the other, it is enabling interventions against the problem that were not possible just a short time ago. Thus, while technology is regularly being used and adapted by human traffickers to enable or mask their crimes, it also has great potential to enhance the ability of advocates, governments and law enforcement agencies to uncover and address such crimes.

The United Nation’s Inter-Agency Coordination Group against Trafficking in Persons (ICAT) summarized the dual nature of technology as follows: “The development of technology has had an important influence on the crime of trafficking in persons, presenting both challenges and opportunities. While technology is frequently misused to facilitate trafficking in persons, its

positive use can also help practitioners combat trafficking, such as by aiding investigations, enhancing prosecutions, raising awareness, providing services to victims, and shedding new light on the make-up and operation of trafficking networks. Taking this into account, future success in eradicating human trafficking, in its many forms, will depend on how countries and societies are prepared for, and equipped to, harness technology in their responses.”⁹

The varying facets of how technology intersects with human trafficking are explored in the following pages of this report.

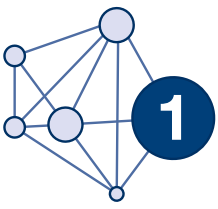
⁵ See Bianca Britton, “Facebook under fire for posts on auction of child bride” [website] (CNN, 23 November 2018). Available at: www.cnn.com/2018/11/20/africa/south-sudan-child-bride-facebook-auction-intl/index.html (accessed 8 May 2020).

⁶ See Planet, “Using space to help life on earth” [website] (Planet Labs Inc.). Available at: www.planet.com/company (accessed 8 May 2020).

⁷ See Umberto Bacchi, “Embrace AI, technology to beat human traffickers, activists told” [website] (Reuters, 15 November 2018). Available at: www.reuters.com/article/us-slavery-conference-tech/embrace-ai-technology-to-beat-human-traffickers-activists-told-idUSKCN1NK2E5 (accessed 8 May 2020).

⁸ See Thorn, “Spotlight helps find kids faster.” [website] (Thorn). Available at: www.thorn.org/spotlight/ (accessed 8 May 2020).

⁹ See ICAT, *Human trafficking and technology: trends, challenges and opportunities. ICAT Issue Brief 07* (Vienna, Austria: ICAT, 2019), p. 1. Available at: www.icat.network/publications (accessed 8 May 2020).



1 The Misuse of Technology to Facilitate Trafficking in Human Beings

This chapter examines how technology is misused to facilitate trafficking in human beings. Research and direct evidence show that human traffickers are misusing technology at all the stages of the crime.¹⁰ Additionally, individuals who are knowingly or unknowingly using services of human trafficking victims are using technology to access, watch, record and disseminate information about these victims. The platforms for such exploitation are virtually limitless — social media, on-line games, dating sites, apps, and so on.

Generally, the crime of human trafficking is comprised of some combination of the following activities:

- 1. Recruitment:** Perpetrators use various tactics to identify and recruit (or procure) victims of human trafficking, who are then exploited to generate illegal profits or reduce costs of production or whose organs could be removed and then sold on illegal markets;
- 2. Renting/purchasing of premises:** Such premises are used to harbour victims in transit, accommodate them at their destination, or as sites where they are exploited;
- 3. Transportation:** Traffickers may use various services in order to transport their victims. This includes obtaining travel documents, whether legal or false;
- 4. Control and compulsion:** Victims are compelled to commit certain acts such as labour or sexual acts, and they are controlled by traffickers to ensure that they are available to work when requested and that they do not report their exploitative situation to law enforcement, NGOs or family. Traffickers employ different methods of control, including physical and psychological abuse, isolation, debt bondage, substance dependency, coercion, fraud, documents withholding etc.;
- 5. Advertising:** Large off-line or online platforms are used for hosting advertisements, reviews, chats, or other forms of communication, in particular for sexual services, providing sex traffickers the means to attract and engage with customers as a prelude to sexually exploit victims. In the case of other forms of trafficking, such as for forced labour or organ removal, advertising of victims is possible, but usu-

ally takes place on specific platforms like the Dark Web;

- 6. Exploitation:** Victims are exploited in different ways: to provide sexual services, to work, beg or commit crimes, for organ removal etc. The main purpose of the crime is for traffickers to acquire illegal proceeds;
- 7. Communications:** Various information systems are used to organize the recruitment and exploitation of victims, including connecting with users of trafficked goods or services;
- 8. Financial transactions:** Payments and transfers of money are involved in all of the above activities. In addition to making payments throughout the trafficking process, traffickers use the profits of the crime for their own benefit.

Over the past twenty years, there has been an increased use of technology in each of these areas.¹¹ In particular, technology is used to recruit and control vulnerable individuals, facilitate their exploitation, reach out to those willing to pay for services of trafficked persons and to provide means for illicit payments and laundering of funds.¹² Technology is also used to provide “virtual” venues for disseminating or exchanging online sexual abuse, including abuse of children.

As technology evolves, so do the tactics used by traffickers. The United Nations Global Initiative to Fight Human Trafficking (UN.GIFT) background paper *Technology and Human Trafficking* notes that regardless of which end of the “sophistication” spectrum traffickers are operating at and where in the world they are committing their crimes, all are benefiting in their criminal activities through advances in technology, which make it faster, easier, cheaper and ultimately more profitable to conduct transactions.¹³

Technology enables criminals to achieve many goals, nevertheless, it is important to understand the major impacts that innovation has on the human trafficking crime specifically. Much of the discussion below focuses on trafficking for sexual exploitation as this is the form of trafficking that has, perhaps, been most significantly affected by the misuse of technology.

¹⁰ See Europol, *Situation Report: Trafficking in human beings in the EU* (The Hague: Europol, February 2016), p. 12.

¹¹ See Mark Latonero, *Technology and Human Trafficking: The Rise of Mobile and the Diffusion of Technology-Facilitated Trafficking* (Los Angeles: USC University of Southern California, 2012), p. 10.

¹² See Andrea Di Nicola, Gabriele Baratto, Elisa Martini, *Surf and Sound: The role of the Internet in people smuggling and human trafficking* (Trento, Italy: eCrime, Department ‘Faculty of Law, University of Trento, March 2017), p. 96, 97. See also Athanassia P. Sykiotou, “Cyber trafficking: recruiting victims of human trafficking through the net”, *Europe in Crisis: Crime, Criminal Justice, and the Way Forward Essays in Honour of Nestor Courakis* (Athens, Greece: Ant. N. Sakkoulas Publications L.P. 2017), p. 1561.

¹³ See UN.GIFT, Background Paper, 017 Workshop: *Technology and Human Trafficking. The Vienna Forum to Fight Human Trafficking* (Vienna: UN.GIFT, 13–15 February 2008), p. 2.

However, anti-trafficking actors should assume that similar misuse, although on a smaller scale, is occurring across most forms of trafficking.

a. Increase in size and profitability of the human trafficking market

As argued in the OSCE paper *Analysing the Business Model of Trafficking in Human Beings to Better Prevent the Crime*, trafficking in human beings can be viewed as a marketplace, although illegal, where people are treated as commodities.¹⁴ The human trafficking marketplace has all the elements needed to function: supply, demand, competition and price.¹⁵ The victims represent the supply side, buyers of goods or services provided by victims represent the demand side. Traffickers compete among each other, including on price to attract more buyers and increase profits. The main objective of traffickers is to maximize their profits and generate more criminal business by exploiting victims. Profit maximization could be achieved by decreasing costs of the criminal enterprise, increasing supply of exploited victims and delivery of new services.¹⁶

Trafficking in human beings is a highly profitable criminal activity and perpetrators who exploit victims generate considerable revenues. Human trafficking is believed to be the third-largest criminal activity in the world, behind drug trafficking and counterfeiting, generating roughly USD 150 billion in criminal proceeds each year.¹⁷ Two thirds, or USD 99 billion, is generated by commercial sexual exploitation and USD 51 billion from forced labour exploitation, including domestic work, agriculture and other economic activities.

The worrying trend is that profits from human trafficking are increasing. In 2005 ILO placed the profit generated by trafficking for labour and sexual exploitation at around USD 31.6 billion a year,¹⁸ while in 2014 the profits had increased to USD 150 billion, indicating substantial growth in the trafficking marketplace over the last 10 to 15 years.

Criminals are the unintended beneficiaries of technology which has enabled them to operate more efficiently and across broad regions, increasing their reach and profits.¹⁹ The Internet has played a key role in increasing the scale, geographic scope, and speed by which crime is being committed²⁰ and there are indications that this is also the case for human trafficking.²¹

i. New business opportunities and delivery of new services.

Technology is increasing the scale of the human trafficking marketplace in different ways. One of the most important and problematic aspects of the misuse of technology in the context of trafficking is that it creates new “business opportunities” by enabling the delivery of new types of “services” such as the live streaming of sexual acts, including of child sexual abuse, to a global audience. This type of exploitation is also known as “cybersex trafficking”. In addition, technology and digitalization has enabled the production and commercialization at a massive scale of pornography made of trafficking victims.

Face-to-face exploitation of adults and abuse of children is a well-established crime, but technology has allowed perpetrators to deliver this abuse online to a massive international audience in exchange for money, without face-to-face contact. Live streaming also enables a broader customer base: in the past traffickers made money from individuals or small groups of buyers for face-to-face transactions involving the exploitation of a victim, limiting the revenue earned from each instance; now, when sexual exploitation is live streamed, the client base can be much larger and profits increase exponentially.²² The scale of this development is immense. No data exists on the number of victims of cybersex trafficking, but there are different estimates about the number of child victims of cybersex trafficking in some countries. In the Philippines, for example, reports vary from 60,000²³ to one million²⁴ instances of child cybersex trafficking. Although the

¹⁴ See OSR-CTHB, UN.GIFT, *Analysing the Business Model of Trafficking in Human Beings to Better Prevent the Crime* (Vienna: OSR-CTHB, UN.GIFT, May 2010), p. 33.

¹⁵ Ibid, p. 32.

¹⁶ Ibid, p. 55.

¹⁷ See ILO, *Profits and Poverty: The Economics of Forced Labour* (Geneva: ILO, 20 May 2014), p. 13

¹⁸ See Patrick P. Belsler, *Forced Labour and Human Trafficking: Estimating the Profits* (Geneva: ILO, March 2005), p. 17.

¹⁹ See Yury Fedotov, “In Just Two Decades, Technology Has Become a Cornerstone of Criminality” [web blog] (Huffpost, 23 October 2017). Available at: www.huffingtonpost.co.uk/yury-fedotov/in-just-two-decades-techn_b_18330400.html?ncid=engmodushpmg00000004&guccounter=1 (accessed 8 May 2020).

²⁰ See Europol, *European Union Serious and Organised Crime Threat Assessment. Crime in the age of technology* (The Hague: Europol, 2017), p. 7.

²¹ See Mark Latonero, *Technology and Human Trafficking: The Rise of Mobile and the Diffusion of Technology-Facilitated Trafficking* (Los Angeles: USC University of Southern California, 2012), p. 10.

²² See Europol, *Internet Organised Crime Threat Assessment (IOCTA) 2018* (The Hague: Europol, 2018), p. 7.

²³ See Matt Blomberg, “Global taskforce tackles cybersex child trafficking in the Philippines” [website] (Reuters, 15 April 2019). Available at: www.reuters.com/article/us-philippines-trafficking-children/global-taskforce-tackles-cybersex-child-trafficking-in-the-philippines-idUSKCN1RR1D1 (accessed 8 May 2020).

²⁴ See Jon Lockett, “Rape for rent. Inside Philippines’ £1bn ‘made to order’ child sex abuse industry making sick vids for Brit paedos” [website] (The Sun, 27 July 2018). Available at: www.thesun.co.uk/news/6868807/philippines-child-sex-abuse-vids-brit-paedos/ (accessed 8 May 2020).

difference in the numbers reported is large, even the most conservative estimates should be considered as a major concern regarding cybersex child trafficking.

The considerable increase of cybersex trafficking as well as the digitalization of pornography of trafficking victims²⁵ has led to the proliferation of online material depicting trafficking victims. For example, in the context of child exploitation, in 2004 the United States National Center for Missing & Exploited Children (NCMEC) reviewed 450,000 files containing child sexual abuse material. In 2018, that number was 45 million files, a one hundred-fold increase.²⁶ The reports of online child sexual abuse and exploitation tracked by NCMEC grew eighteen-fold from 2013 to 2018, from 1 million to 18.4 million.²⁷ The number of child victims who were identified also increased, growing five-fold between 2010 and 2017, from roughly 3,000 to 15,000 children.²⁸ While this increase in identification was also attributed to the use of technology, notably, these figures also highlight how the scale of misuse of technology in many ways is outpacing the scaling up of responses.

There are reasons to believe that the marketplace for cybersex trafficking and pornography made of trafficking victims will only continue to increase if significant prevention and disruption measures are not undertaken. One of the main reasons is that the Internet provides traffickers and potential traffickers with an environment in which they can operate with an enhanced level of safety and anonymity, and advertise their victims to a global audience on hundreds or thousands of platforms with minimal costs.

It might be argued that a clear distinction should be made between technology-enabled THB and online child sexual abuse; that these are two separate crimes that should be analysed separately. Although it is true that online child sexual abuse does not always amount to trafficking and that in many jurisdictions the online procuring, selling and viewing of child sexual abuse material is a separate crime to trafficking, online child sexual abuse can — in many cases — also constitute human trafficking or be part of human trafficking crimes. In some OSCE participating States, legal proceedings

have clearly shown that online child sexual abuse material was produced through trafficking. For example, in 2016 the Bergen District Court in Norway convicted a Norwegian national of contributing to human trafficking by having commissioned and paid for the sexual abuse of children in the Philippines that was live-streamed to Norway via the Internet.²⁹ The Court concluded that the crime of human trafficking was committed because the man had used recruiters in the Philippines to find vulnerable children who were then forced to engage in sexual acts/abuse with other children; the offender watched these acts via live streaming in exchange for money.

To summarize, technology has eliminated the barriers of face-to-face interaction between traffickers and victims on one side and — at least in the case of sex trafficking — buyers on the other side. Thus technology is making it easier for traffickers to conduct a wide variety of transactions and provide different types of services involving the exploitation of victims.

ii. Increasing access of traffickers to a larger market

As mentioned, THB is attractive to criminal actors due to its high degree of profitability. In order to maximize criminal profits, traffickers seek to reduce costs and increase the volume of their illegal business. To increase the volume, they must attract more clients who will pay for services. In the context of trafficking for sexual exploitation, the Internet is a perfect platform for this since traffickers can easily advertise services provided by exploited victims on a large scale and efficiently connect with sex buyers.³⁰ As in the case of marketplaces for legal commercial activities, the virtual space reduces the costs of advertising of services considerably, thus providing greater flexibility to traffickers. It also reduces the costs and risk from the demand side, since buyers can undertake transactions from the safety of an electronic device, although this also leaves digital footprints which can help in their identification by law enforcement.³¹

As confirmed by research findings, once a victim is procured, traffickers use online platforms such as

²⁵ See Brittany Anthony, *On-Ramps, Intersections, and Exit Routes: A roadmap for Systems and Industries to Prevent and Disrupt Human Trafficking* (Washington D.C.: Polaris, July 2018), p. 7.

²⁶ See Thorn, "Technology has made it easier to harm kids." [website] (Thorn). Available at: www.thorn.org/child-sexual-exploitation-and-technology/ (accessed 8 May 2020).

²⁷ See NCMEC, "Our Work. NCMEC data" [website] (NCMEC). Available at: www.missingkids.com/ourwork/ncmecdata#bythenumbers (accessed 8 May 2020).

²⁸ See Ivan Pentchoukov, "Shielded by Technology, Child Sex Abuse Epidemic Festers on Darknet" [website] (The Epoch Times, 6 September 2018). Available at: www.theepochtimes.com/shielded-by-technology-child-sex-abuse-epidemic-festers-on-darknet_2641611.html (accessed 8 May 2020).

²⁹ See National Criminal Investigation Service (NCIS) of Norway, *Human Trafficking in Norway — Criminal Actors: A Situational Picture Based on Police Sources* (Oslo: NCIS, 20 December 2017), p. 23.

³⁰ See Stephanie Hepburn, *Technology and Human Trafficking* (Alexandria, Virginia, USA: National Association of State Mental Health Program Directors, September 2016), p. 5.

³¹ See Danah Boyd, Heather Casteel, Mitali Thakor and Rane Johnson, *Human Trafficking and Technology: A framework for understanding the role of technology in the commercial sexual exploitation of children in the U.S.* (Microsoft Research Connections, 2 December 2011), p. 6. Available at: www.microsoft.com/en-us/research/wp-content/uploads/2016/02/en-us-collaboration-focus-education-htrframework-2011.pdf (accessed 8 May 2020).

classified websites, social media apps, dating apps, or escort service sites to advertise their victims for sexual exploitation.³² For example, in 2017 in the U.S., the primary business model in 84.3% (458) of the active sex trafficking cases was “Internet-based commercial sex”. 72.3% (331) of the cases involved advertisements posted on Backpage.com. 7.6% (35) of the “Internet-based commercial sex” cases involved the use of Facebook, and 6.3% (29) involved advertisements posted on Craigslist.com.³³ In Austria, in 2017, the Internet was used as the most common criminal infrastructure by perpetrators in 74% of human trafficking cases.³⁴ A recent report by U.S.-based NGO Thorn from interviews with 260 U.S. survivors of human trafficking found that 75% were advertised online for sexual services³⁵ and that online advertising is increasing while advertising on the street is decreasing.

The same trend exists in the European Union. In its report on *Criminal Networks Involved in the Trafficking and Exploitation of Underage Victims in the EU*, Europol concludes that “the online advertisement of sexual services is an increasing phenomenon relating to THB for sexual exploitation, with children being advertised as adults”³⁶. And in Southeast Asia, online platforms facilitating live streaming of sexual abuse of children are associated with the rise in child trafficking in the region, which is estimated to generate USD 3–20 billion in illegal profit each year.³⁷

In a comparative report on demand for sex tourism and trafficking from 2007, researchers undertook a twelve-month examination of the marketplace of commercial sexual exploitation in four countries—Jamaica, Japan, the Netherlands, and the United States—which have major markets of commercial sexual services and which are destinations for sex tourists from abroad and internally.³⁸ The authors concluded that “technology has become the single greatest facilitator of the com-

mercial sex trade in all of the countries observed, with the exception of Jamaica where word of mouth continues to dominate”.³⁹ With the dramatic growth of the Internet and tech-based tools since the report was produced, the trend they observed is undoubtedly much greater today.

The examples from the European Union, Japan and the United States confirm that while many websites serve legitimate purposes, they can also provide a relatively easy, cheap and effective avenue for traffickers to connect with buyers.

Another way of advertising the services of human trafficking victims is the use of private online review boards, also called hobby boards. These private platforms are used by buyers of sexual services to rate and review the “quality” of the services provided, including by exploited victims. The review can include information on age, type of services, payment etc. Review boards can be openly accessible or limited to members, whether paying or not.⁴⁰

Law enforcement reports that private groups in communication tools such as Telegram and WhatsApp are being used to advertise sexual services to large communities, especially in Eastern Europe.⁴¹ These private groups include thousands of members and can be joined by invitation or referral only. They advertise individual sexual services but also new types of services such as sex-tours in different countries or contracting a prostituted person for an extended period, such as for a month. The hidden and illicit nature of these groups combined with the type of services advertised and limitations of the prostituted person’s movement, indicates that these private groups carry significant human trafficking risks.

The use of technology for the sale of domestic workers has been also documented in some parts of the

³² See Mark Latonero, *Human Trafficking Online The Role of Social Networking Sites and Online Classifieds* (Los Angeles: University of Southern California, 1 September 2011), p. 18. See also Hao Wang, Congxing Cai, Andrew Philpot, Mark Latonero, Eduard H. Hovy, and Donald Metzler, “Data integration from open internet sources to combat sex trafficking of minors”, *Proceedings of the 13th Annual International Conference on Digital Government Research* (June 2012), pp. 246–252. See also Michelle Ibanez and Rich Gazan, “Detecting sex trafficking circuits in the U.S. through analysis of online escort advertisements”, *ASONAM ‘16: Proceedings of the 2016 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining* (August 2016), pp. 892–895.

³³ See Kyleigh E. Feehs and John Cotton Richmond, 2017 — *Federal Human Trafficking Report* (Human Trafficking Institute, 2018), p. 12.

³⁴ See OSCE, “19th Alliance against Trafficking in Persons. Using Technology to Combat Trafficking in Human Beings: Turning a Liability into an Asset” [website] (Vienna: OSCE, 2019), start at min. 19:20. Available at: <https://www.youtube.com/watch?v=hXWuspTbg4o> (accessed 8 May 2020).

³⁵ See Thorn and Vanessa Bouche, *Survivor Insights: The Role of Technology in Domestic Minor Sex Trafficking* (Los Angeles: Thorn, January 2018), p. 7.

³⁶ See Europol, *Criminal networks involved in the trafficking and exploitation of underage victims in the European Union* (The Hague: Europol, 18 October 2018), p. 7.

³⁷ See Mely Caballero-Anthony, “A Hidden Scourge — Southeast Asia’s refugees and displaced people are victimized by human traffickers, but the crime usually goes unreported”, *IMF Finance and Development Magazine September 2018* (International Monetary Fund, 2018), p. 19.

³⁸ See Shared Hope International, *DEMAND. A Comparative Examination of Sex Tourism and Trafficking in Jamaica, Japan, the Netherlands, and the United States* (Shared Hope International, 2007), p. 1.

³⁹ *Ibid.*, p. 5.

⁴⁰ See Rob Spectre, *Beyond Backpage, Buying And Selling Sex In The United States One Year Later* (New York: childsafe.ai, 2019), p. 26.

⁴¹ Expert meeting on the OSCE initiative to map the landscape of online platforms where the risks of human trafficking are increased, 9 December 2019, Hofburg, Vienna

world.⁴² Social media platforms, applications and websites are being used to illegally advertise the sale of victims of human trafficking for domestic servitude. Interested buyers can review these openly available online resources and contact sellers via private messages. The volume of victims bought and sold through online platforms are in the thousands, which underlines how technology can facilitate the crime of human trafficking for labour exploitation.

Technology is playing a greater role in trafficking in human beings for the removal of organs, as traffickers are increasingly using the Internet as a platform to advertise the selling of organs globally. Detailed statistics on how traffickers advertise organ selling online are not yet available, nevertheless some reports have highlighted an increase of organ offers over the Internet in some regions of the OSCE.⁴³

In the case of other forms of trafficking in human beings, such as forced begging, exploitation in forced criminality or forced marriages, the advertisement of victims, especially online, is not a common phase of the crime. It is true that, as mentioned in the Introduction of this publication, there are reports of the online sale of children for forced marriages, nevertheless, the advertisement of victims in these cases is not a usual practice and is incomparable in scale with trafficking for sexual exploitation. The main reason for this difference is that it is unwise for traffickers to openly advertise activities which are heavily punished by criminal systems. Unlike trafficking for sexual exploitation, where victims are advertised for providing legal services (escort, massage parlours, exotic dancing, prostitution in countries where it is legal), traffickers cannot easily mask or openly advertise the selling of children for marriages or use of victims to commit crimes.

Much illicit criminal activity is also conducted through the “dark web”, a section of the Internet that is only accessible via a certain browser which enables anonymity. Through the dark web, a trafficker can communicate with buyers anonymously. However, the use of the dark web for advertising human trafficking victims has its limitations. As mentioned above, human trafficking is a financially motivated crime and traffickers seek as many clients as possible. This is best achieved by using the open web to which everyone has access. The dark web has several technological barriers that can reduce the overall marketplace, and thus it is not well-suited for increasing the numbers of clients, and is more geared towards buyers with niche interests, like in the cases of human trafficking for organ removal, and

those trading in child sexual exploitation imagery.⁴⁴

The properties of technology and online platforms allow traffickers to advertise victims in a new way which was not possible before and to a larger audience. In addition to indicating the type of services delivered by the victims and prices, traffickers are able to provide visual and video content to attract more clients. Therefore, technology has led to the professionalization of advertising of human trafficking victims or goods delivered by them and increased competition among traffickers in terms of presenting their services to the public.

The ability of traffickers to easily advertise their victims on online platforms and avoid the need to have a physical presence on the streets could lead to an increase of the number of traffickers in the market and subsequently to an increase in competitiveness. If, previously, certain organized criminal groups would exercise physical control over certain cities or parts of cities and have a monopoly over criminal trafficking activity, now this is not possible because no one can have physical control over the Internet. As a result, more organized criminal groups or individual traffickers could enter the human trafficking business and easily advertise their victims online, connect with buyers online and provide the services in a location agreed with the client without the need to have in place the criminal infrastructure associated with on-the-street forms of human trafficking. Although this impact needs to be researched in more depth, the exponential increase in the online advertisements of human trafficking victims in different parts of the world, described earlier in this section, could be partially explained by the entry of additional criminals in the human trafficking marketplace who are taking advantage of the technological progress. Additionally, visibility within the market online allows traffickers to research and understand new markets, and thereby more easily penetrate areas with higher demand and profitability.

To conclude, technology enables traffickers to broadly and easily advertise their victims on different platforms, including legitimate ones. This allows them to reach a larger market of buyers, who swarm to these sites, which enhances the efficiency and volume of transactions without significantly increasing economic costs and risks. This increase in the frequency of transactions is well described in a recent report which looks at the use of Internet in the human trafficking and the smuggling process in Bulgaria, Italy, Romania and United Kingdom. The report quotes one of the traffickers as follows “*[f]acilities on the Internet (Facebook, Twitter, WhatsApp and Viber) are the easiest and quickest ways*

⁴² See Owen Pinnell and Jess Kelly, “Slave markets found on Instagram and other apps” [website] (BBC, 31 October 2019). Available at: www.bbc.com/news/technology-50228549 (accessed 8 May 2020).

⁴³ Michael Bos, *Trafficking in Human Organs* (Directorate-General for External Policies, Policy Department, European Parliament, 18 June 2015), p. 15. Available at: [www.europarl.europa.eu/RegData/etudes/STUD/2015/549055/EXPO_STU\(2015\)549055_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/STUD/2015/549055/EXPO_STU(2015)549055_EN.pdf) (accessed 8 May 2020).

⁴⁴ See Europol, *Internet Organised Crime Threat Assessment (IOCTA) 2019* (The Hague, Europol, 2019), p. 31.

to communicate. [...] The internet is faster than any other method. I have customers daily, between 10-50 people.”⁴⁵

iii. Improving the access of buyers to the market.

Like most criminal markets, trafficking in human beings is largely driven by demand⁴⁶. Those who use the goods or services provided by victims of human trafficking (in the context of trafficking for sexual exploitation, these are referred to here as buyers) make payments to criminals thus sustaining their illegal activity. Demand in the human trafficking marketplace is high as annual profits from human trafficking amounted to USD 150 billion in 2014, as noted above.

The use of technology and online platforms in the human trafficking marketplace has provided great benefits for the users of goods or services produced by trafficking victims, especially in the area of trafficking for sexual exploitation. For example, buyers can research a particular service they would like to receive and engage in a transaction in the privacy of their homes in front of a computer or smartphone without the need to leave their residence. They can also use electronic means of payment to pay for the transaction thus limiting contact with traffickers or middleman. In the case of live streaming content of a sexual nature, buyers do not have to even interact face-to-face with the trafficking victim; they can be present anywhere in the world and still receive the service they desire. To do all this, buyers do not need advanced technological skills since online marketplaces for commercial sexual exploitation are easily accessible on the open web and often user friendly.

Interestingly, technology and the Internet allowed marketplaces where victims of trafficking are exploited to be more visible to the general public and to buyers in particular. While these marketplaces do not present themselves to the public as facilitating trafficking in human beings, the Internet is being used regularly to facilitate trafficking. There are thousands of websites on the open web, numerous public and private groups on social media, and communication applications containing information about provision of sexual services or cheap labour. These websites are easily accessible from anywhere in the world and many of them provide content in different languages to attract more viewers and potential clients. Visibility has increased also because of search engines such as Google, Bing and

Yahoo, which are able to scan the web for websites advertising certain services, such as escort services for example, and large classified advertisement platforms, such as backpage.com.⁴⁷ Visibility within the marketplace has also increased because of the advanced and targeted advertising methods online used by traffickers, described in the previous section.

Technology has enabled buyers of services provided by trafficking victims (whether knowingly or unknowingly) to have access to more and increasingly accurate information about existing services in the market. For example, advertisements for sexual services posted on online platforms offer not only basic information about the victims' physical appearance, type of services provided and prices asked, but can also include pictures and videos of victims and feedback from other buyers, options which were not available in the offline marketplace. This additional information and visual content leads to personalized choice for buyers and allows traffickers to take a more informed decision about the type of services he or she should offer. At the same time, feedback from other buyers decreases the uncertainty about transactions and reassures buyers that they will benefit from the service they desire. Finally, the open nature of technology and the vast amount of information existing online and available to buyers considerably decreases the so-called transaction costs for obtaining valuable information about the marketplace. With low transaction costs, the number of buyers willing to enter the marketplace will likely increase and lead to more exploitation of victims.

Buyers also benefit from the increase in the competitiveness in the human trafficking marketplace as it shifts to online platforms. As discussed in the previous section, online platforms allow any trafficker, whether part of a large criminal organization or unaffiliated individual, to advertise their victims on the Internet. This is well reflected in the U.S., where data has shown that the primary business model in 84.3% of the active criminal sex trafficking cases was “Internet-based commercial sex”. The entry of additional players in the marketplace and more supply leads to an increase in competitiveness because buyers have more options to choose from. Moreover, increased supply can lead to lower prices which can then increase the frequency of transactions.

Buyers can also use the Internet to research goods and services that might be provided by victims of other

⁴⁵ See Andrea Di Nicola, Gabriele Baratto and Elisa Martini, *Surf and Sound: The role of the Internet in people smuggling and human trafficking* (Trento, Italy: eCrime, Department Faculty of Law, University of Trento, March 2017), p. 61.

⁴⁶ See James O. Finckenaer and Jennifer Schrock, *Human Trafficking: A Growing Criminal Market in the U.S.* (U.S. National Institute of Justice, January 2001), p. 3. Available at: www.nij.ojp.gov/library/publications/human-trafficking-growing-criminal-market-us (accessed 8 May 2020).

⁴⁷ Backpage.com was a website seized by the U.S. authorities on 9 April 2018 and which was one of the main platforms in the U.S. to facilitate trafficking in human beings for sexual exploitation. More information can be obtained at www.justice.gov/opa/pr/justice-department-leads-effort-seize-backpagecom-internet-s-leading-forum-prostitution-ads.

forms of trafficking in human beings. As mentioned in the previous section, there is an increase of organ offers over the Internet in some regions of the OSCE. This is an opportunity for buyers to respond to these Internet offers and acquire the organs they need. At the same time, it has to be acknowledged that the use of technology in the case of organ removal is much smaller than in the case of trafficking for sexual exploitation and we cannot speak of large online marketplaces, but rather of smaller ecosystems.

Finally, probably the most important factor why buyers use technology to use services delivered by human trafficking victims, such as commercial sexual activity, is the increase in anonymity, which lowers the risks to be identified by law enforcement authorities. Technology allows buyers a range of options to hide their identities. They can access websites facilitating the sale of sexual services using Virtual Private Networks or the Tor browser, which hide their IP address. Buyers can pay for services using cryptocurrency or other non-identifiable electronic payments. They can also use fake profiles on social media or communicate with victims and traffickers via encrypted communication apps. They also regularly share information through online networks about potential law enforcement activity to further avoid risk.

All of the factors described in this section — the increased visibility of the marketplace, accuracy of information, increased competition, lower risk and enhanced anonymity — lead as a result to a more personalized choice for buyers, easier access to the market, market transparency, buyer safety and anonymity, and thus increased demand for goods or services provided by trafficking victims.

In conclusion, technology has given the opportunity for criminals to increase the human trafficking marketplace. Technology lowers the risks for traffickers and buyers to be caught — especially at any meaningful scale — by law enforcement. The decrease in risk and accountability will attract more criminals to human trafficking and buyers who can enjoy illicit services without any consequences. Second, traffickers learned to misuse technology for the development and delivery of new, non-face-to-face services such as cybersex trafficking. Here, technology is leveraged to create a global marketplace where clients in one part of the world can pay for services delivered by victims exploited in another part of the world. Last but not least, technology allows traffickers to increase the amount of information in the market which leads to greater competition, greater access and efficiency for buyers, and overall increase in the frequency of transactions.

iv. Reducing risk for traffickers

Trafficking in human beings occurs because it is a low risk / high reward crime.⁴⁸ Traffickers employ different methods to lower the risks of being caught by law enforcement and prosecuted. Such methods include the constant change of telephones and SIM cards, moving of exploited victims from one city or country to another, preventing victims from establishing relationships beyond the trafficker, and isolating and monitoring victims. The low and declining number of prosecutions,⁴⁹ in comparison with the high number of estimated victims, confirms the effectiveness of measures undertaken by traffickers to lower the risks of accountability and the challenges faced by law enforcement.

In addition to traditional methods of lowering risks, traffickers can use technology to separate themselves further from the illegal transactions, victims, and buyers in order to avoid criminal liability. One example is the use of fake identities online. Traffickers can create hundreds of fake identities and use those identities to communicate with victims, buyers and other members of criminal groups. They can do this in combination with the use of Virtual Private Networks or the Tor browser to ensure that the IP and the location of the device they are using cannot be identified. Another method employed by traffickers to increase their anonymity is the use of encrypted communication applications, which cannot be intercepted by third parties. To avoid being identified by banking institutions, traffickers use cryptocurrency to receive payments from buyers and move criminal proceeds across borders. Perpetrators also share log-in credentials to one mutual online account (in Dropbox, Google Drive, OneDrive etc.) to avoid detection. Live streaming via Skype and other closed platform has also been increasingly used to avoid detection and prosecution.

Since technology allows traffickers to advertise their victims online and conclude transactions with buyers via electronic means, traffickers are in a position to reduce their operations on the streets and move them entirely into a virtual space. This way, traffickers do not have to worry about their victims being spotted by law enforcement or anti-trafficking NGOs. This is a significant de-risking of the crime as it serves to create an additional barrier to law enforcement in victim and trafficker identification.

The capacity of technology to reduce risk for traffickers in the human trafficking marketplace has important implications because it can lead to an increase in impunity and criminal activity in this field. Like in many areas of social and economic life where people invest

⁴⁸ See UNODC, *Human Trafficking: An overview* (Vienna: UNODC, 2008), p. 4.

⁴⁹ According to data from 2019 U.S. Trafficking in Persons report, between 2015 and 2018, the global prosecution rate decreased by 42%; in Europe it decreased by 52%.

in opportunities with low risks and high rewards, the human trafficking field operates on the same principle. Organized criminal groups will invest their resources in activities with low risks and the human trafficking industry is a great opportunity from this point of view, especially given that technological progress enables criminals to hide and advertise their operations in secure ways.

b. Recruitment: Turning vulnerable individuals into victims

Similarly, labour traffickers and unscrupulous recruiters are using social media to make false representations about jobs to attract candidates, often targeting individuals from vulnerable communities.⁵⁰ Among other things, they may offer high wages, housing, or travel and immigration benefits, all of which are fabricated to attract job seekers.⁵¹ Labour recruitment agencies from Europe,⁵² Latin America and Asia are using the Internet and social media apps such as Facebook and WhatsApp to communicate with potential recruits, including in previously hard-to-reach, remote areas.⁵³ There can be a high level of trust in these advertisements with the workers' fate often dependent on the ethics of the particular recruiter concerned. One study, for example, found that Filipino overseas workers are more likely to trust an ad from Facebook than from the government-backed Philippines Overseas Employment Administration (POEA), which is designed to regulate job recruiters.⁵⁴ This might also be the case in other countries and regions in the OSCE, where state institutions do not have enough capacity to ensure safe and legal labour migration.

Human traffickers are using online networks and mainstream social media applications to lure potential victims of labour and sexual exploitation by covering up their criminal intent.⁵⁵ For example, traffickers regularly use common dating tools to geo-locate potential victims and profile them using social media. They then

make initial contact through messaging apps or other online platforms.⁵⁶ The same platforms are then used by traffickers for advertising to their customers.

A 2018 report found that 55% of victims of trafficking for sexual exploitation in the U.S. whose exploitation started in 2015 met their trafficker online via a text, a website, or an app. Moreover, 42% reported that online tools were used by traffickers to build relationships with their victims.⁵⁷ In Bulgaria, victims of human trafficking, perpetrators and law enforcement authorities confirmed that the Internet is largely used to recruit potential victims of labour exploitation.⁵⁸ Technology is very useful to traffickers to recruit victims for clear reasons. Primarily, it helps them more easily identify potential victims as publicly accessible social media profiles already provide a certain amount of information about a targeted victim. Traffickers may have immediate access to the victim's location, information about education, employment, habits, hobbies and subjects of interests, friends and places regularly visited, including their vulnerabilities such as alcohol and substance abuse, homelessness and domestic violence. In the case of minors, traffickers are able to find information revealing certain vulnerabilities that might be efficiently used against the minor, such as difficult relationships with parents, teachers or friends. A simple analysis of this information already allows traffickers to develop luring or grooming strategies for future exploitation of victims in different forms.

The Internet is also being used to recruit victims of human trafficking for the purpose of organ removal. One of the methods used by traffickers is to place ads on different websites promising high-paying employment in other countries. Recruited victims are transported abroad and when the employment opportunity fails to materialize and they accrue high debts, traffickers will offer the victims, as the only alternative to repay the imposition of a false debt, the sale of an organ.⁵⁹

⁵⁰ See Ada Volodko, Ella Cockbain and Bennett Kleinberg, "Spotting the signs of trafficking recruitment online: exploring the characteristics of advertisements targeted at migrant job-seekers", *Trends in Organized Crime* (2020) 23:7–35 (Springer, 31 December 2019), p. 7. See also Mark Latonero, Bronwyn Wex and Meredith Dank, *Technology and Labor Trafficking in a Network Society. General Overview, Emerging Innovations, and Philippines Case Study* (Los Angeles: University of Southern California, February 2015) p. v.

⁵¹ Ibid.

⁵² See ITUC, Churches' Commission for Migrants in Europe and Anti-Slavery International, *The Role of the Internet in Trafficking for Labour Exploitation* (ITUC, Anti-Slavery and CCME, 2011), p. 11.

⁵³ See Brittany Anthony, *On-Ramps, Intersections, and Exit Routes: A roadmap for Systems and Industries to Prevent and Disrupt Human Trafficking* (Washington D.C.: Polaris, July 2018), p. 21

⁵⁴ See Mark Latonero, Bronwyn Wex and Meredith Dank, *Technology and Labor Trafficking in a Network Society: General Overview, Emerging Innovations, and Philippines Case Study* (Los Angeles: University of Southern California, February 2015), p. 26.

⁵⁵ See Anita Lavorgna, "Organised Crime goes online: realities and challenges", *Journal of Money Laundering Control* 18(2) (Emerald, May 2015), p. 153, 155.

⁵⁶ See Brittany Anthony, *On-Ramps, Intersections, and Exit Routes: A roadmap for Systems and Industries to Prevent and Disrupt Human Trafficking* (Washington D.C.: Polaris, July 2018), p. 19.

⁵⁷ See Thorn and Vanessa Bouche, *Survivor Insights: The Role of Technology in Domestic Minor Sex Trafficking* (Los Angeles: Thorn, January 2018), p. 6.

⁵⁸ See Andrea Di Nicola, Gabriele Baratto, Elisa Martini, *Surf and Sound: The role of the Internet in people smuggling and human trafficking* (Trento, Italy: eCrime, Department 'Faculty of Law, University of Trento, March 2017), p. 97.

⁵⁹ See OSCE, *Trafficking in Human Beings for the Purpose of Organ Removal in the OSCE Region: Analysis and Findings, Occasional Paper Series no. 6* (Vienna: OSCE, July 2013), p. 28.

It has also been documented that terrorist and violent extremist groups are using social media to recruit victims for forced marriages, labour and sexual exploitation. For example, ISIL members used the “lover boy” method to recruit through chat rooms women in vulnerable situations. Upon their arrival in the conflict zones, however, the women found themselves held captive, abused, and tortured by their “husbands”.⁶⁰ Terrorist groups also use Internet to groom and lure children throughout the world by tailoring their online recruitment strategies to the interests and vulnerabilities of the young Internet users in order to get them involved in different illegal activities, such as committing crimes in their own countries, but also to exploit them for labour and sexually in a conflict zone.⁶¹

Moreover, recruiting victims with the help of technology allows traffickers to hide their true identities. A social media, dating or video gaming profile can be created using a false identity, thus ensuring a high degree of anonymity for the trafficker. Traffickers can utilize hundreds or even thousands of virtual identities, whereby they use technology as a force multiplier for their criminal operations.

Another major advantage of technology for traffickers is the ability to recruit victims without face-to-face interaction; this decreases the chances of being caught by law enforcement as it is done in the relative privacy of a closed chatroom or messaging application rather than in public spaces where it would be considered suspicious to see minors interacting with unknown adults. This method of online recruitment is also much more convenient. With a lack of face-to-face interaction between victims and traffickers, bringing perpetrators to justice becomes more difficult.

An important impact that technology has on the recruitment of human trafficking victims is that technology allows for expanding recruitment from local areas to national or regional areas. Without technology, traffickers would focus on recruiting victims in their proximity,

while with technology they can expand their operations and target victims from other parts of the country or from neighbouring countries.

Current and past research on the misuse of technology by traffickers to recruit victims has focused primarily on the role of social media.⁶² This is justified as billions of people around the world, including children, use social media platforms every day and such platforms present tangible risks for human trafficking recruitment. Nevertheless, it is important to mention that social media is not the only virtual platform used by traffickers for recruitment. Cases in certain OSCE participating States as well as media reports have shown that traffickers are also using on-line video games to target potential victims and lure them to be sexually exploited.⁶³ Dating sites are also frequently used by traffickers to recruit victims, since Facebook, for example, is perceived sometimes as being a bit harder to use to recruit in comparison with the dating sites.⁶⁴

Messaging apps, such as KIK, KakaoTalk, WeChat and WhatsApp, are widely used by traffickers to recruit victims, especially children,⁶⁵ and to communicate with victims and buyers.⁶⁶ The use of messaging apps and online video games by traffickers to recruit victims can be explained, as already mentioned, by the ability to create fake profiles to more easily establish a relationship with a potential victim and to obtain a degree of anonymity online to avoid being traced back by law enforcement or other interested parties. Most of the commonly used messaging apps provide end-to-end encryption thus ensuring that communication between the trafficker and the victim cannot be accessed by third parties.

The above-mentioned features are applicable to many forms of human trafficking, including sexual exploitation, forced labour, removal of organs, forced begging, exploitation in forced criminality and forced marriages. However, there might be some differences between different forms of trafficking: for example, in some cases

⁶⁰ See U.N. Security Council, Counter-Terrorism Committee, Executive Directorate, *Identifying and Exploiting the Nexus Between Human Trafficking, Terrorism, and Terrorism Financing* (CTED, 2019), p. 38.

⁶¹ See UNODC, *Handbook on Children Recruited and Exploited by Terrorist and Violent Extremist Groups: The Role of the Justice System* (Vienna: UNODC, 2017), p. 13.

⁶² Examples of research include:

- Brittany Anthony, *On-Ramps, Intersections, and Exit Routes: A roadmap for Systems and Industries to Prevent and Disrupt Human Trafficking* (Washington D.C.: Polaris, July 2018).
- Ryan Kunz, Meredith Baughman, Rebecca Yarnell and Celia Williamson, *Social Media and Sex Trafficking Process from connection and recruitment, to sales* (University of Toledo, 2018).
- Mark Latonero, *Human Trafficking Online The Role of Social Networking Sites and Online Classifieds* (Los Angeles: University of Southern California, 1 September 2011).

⁶³ See Thorn and Vanessa Bouché, *A Report on the use of technology to recruit, groom and sell domestic minor sex trafficking victims* (Los Angeles: Thorn, January 2015), p. 38.

⁶⁴ See Andrea Di Nicola, Gabriele Baratto and Elisa Martini, *Surf and Sound: The role of the Internet in people smuggling and human trafficking* (Trento, Italy: eCrime, Department Faculty of Law, University of Trento, March 2017), p. 40.

⁶⁵ See Brittany Anthony, *On-Ramps, Intersections, and Exit Routes: A roadmap for Systems and Industries to Prevent and Disrupt Human Trafficking* (Washington D.C.: Polaris, July 2018), p. 17.

⁶⁶ See Thorn and Vanessa Bouche, *Survivor Insights: The Role of Technology in Domestic Minor Sex Trafficking* (Los Angeles: Thorn, January 2018), p. 34.

victims generally play a passive role, typically being approached proactively by the trafficker. In contrast, in other cases like labour exploitation, victims may play a more active role, often unsuspectingly contacting a trafficker in their search for employment.

Understanding the use of technology to recruit victims of human trafficking is extremely important when studying the profile of victims recruited. Traffickers prey on the vulnerabilities of victims, using those vulnerabilities to recruit and exploit them.⁶⁷ Perpetrators often look for individuals from socially vulnerable families with few economic opportunities, or persons who could be easily deceived and coerced. When victims are being recruited in the virtual space, a current ongoing challenge is to understand whether perpetrators are looking only for victims from vulnerable families with few opportunities, or are also targeting victims from whom it would be easy to obtain sensitive information or visual content, such as nude photos or videos, regardless of their socio-economic status. Indeed, some reports show that victims lured on-line are not necessarily from families with limited financial means. Young people from households with higher socio-economic status are often more exposed to sexual material online than those from lower income families due to their higher access to technology platforms.⁶⁸ Traffickers manage to lure such victims, often minors and teenagers, because they lack awareness or knowledge about the risks of on-line criminal activities, lack parental monitoring, have a history of abuse or depressive feelings and thoughts, or have a poor relationship with parents.⁶⁹

c. Manipulation: Exerting control and influence over victims

The exploitation of victims is possible because traffickers have control over the victims' movement and decisions. Perpetrators decide when the victims should work or rest, where the victims can go, and with whom they can meet. Traditionally, control over victims is accomplished by using physical violence, face-to-face monitoring and restricting movement. Now, technology enables traffickers to shift from violent methods to more subtle forms of control and influence over victims.

Various technologies are used by traffickers to maintain control and influence over victims. For example, the

U.S. National Human Trafficking Hotline has reported cases in which an intimate partner threatens to sell videos or photos of sex acts to pornography websites, in order to blackmail or coerce their partners with the aim of exploiting them sexually. There are multiple cases involving both transnational and domestic trafficking in which traffickers have taken photographs of their victims naked or engaging in various sex acts. These are used as a controlling mechanism, with traffickers threatening to send the content to family or friends if the victim decides that he or she wants to leave, or refuses to pay "debts". This is particularly used for victims who are controlled through debt bondage, since they are normally given more freedom of movement. Such photos in the possession of the trafficker stops them from escaping or going to the police.

In a study examining 137 trafficking victims in the Netherlands, using data from 37 completed criminal investigations conducted by 13 different police regions between 2007 and 2011, researchers found that shame and humiliation through the threat of placing photos of the victim containing explicit material on the Internet occurred in 8.8% of cases.⁷⁰ This indicates that such methods of control create significant deterrents for victims to seek help.

Central to all methods of control is the deliberate practice of isolating victims. While social media is used primarily to connect, traffickers extend control over virtual social media spaces to cut a victim off from their support network. For example, a Polaris Project survey found that in 34% of the cases examined, traffickers had restricted victims' social media use in some way and monitored which sites they accessed. Polaris also cites the case of a victim who was only allowed contact with other victims via social media; this skewed her perception of social norms, since everyone she was in contact with was suffering the same abuses.⁷¹

Monitoring the location and controlling the movement of victims can be easily done by traffickers through the misuse of technology. Most smartphones have GPS technology and built-in video cameras which allow traffickers to monitor and have total control over victims' movements without face-to-face contact and from great distances, as long as there is an Internet connection. Some devices also have location sharing applica-

⁶⁷ See OSR-CTHB and UN.GIFT, *Analysing the Business Model of Trafficking in Human Beings to Better Prevent the Crime* (Vienna: OSR-CTHB, UN.GIFT, May 2010), p. 65. See also UNODC, *Issue Paper Abuse of a position of vulnerability and other "means" within the definition of trafficking in persons* (Vienna: UNODC, April 2013).

⁶⁸ See Sonia Livingstone, Anke Goerzig, Leslie Haddon and Kjartan Ólafsson, *Risks and Safety on the Internet: The Perspective of European Children. Full Findings* (The London School of Economics, 2011), p. 133.

⁶⁹ See Mare Ainsaar and Lars Loof, *Online behaviour related to child sexual abuse. Literature Report* (Stockholm: Council of the Baltic Sea States, 2010), p. 46.

⁷⁰ See Maria Ioannou and Miriam S.D. Oostinga, "An empirical framework of control methods of victims of human trafficking for sexual exploitation", *Global Crime*, 2015 Vol. 16, No. 1, 34–49 (Routledge, 2015), p. 39.

⁷¹ See Brittany Anthony, *On-Ramps, Intersections, and Exit Routes: A roadmap for Systems and Industries to Prevent and Disrupt Human Trafficking* (Washington D.C., Polaris, July 2018), p. 26.

tions preinstalled on phones, such as Find My Phone on Apple iPhones. On devices without a preinstalled location-sharing application, traffickers can download a number of similar advanced apps from online apps stores, usually free of charge. Current location sharing apps have a large number of sophisticated features including automatic notification of users about a change in location of another user, which allows traffickers to be constantly updated about the movement of the victim.

d. Hiding profits: Facilitating illicit financial flows

Trafficking in human beings is a highly profitable crime on par with counterfeiting, and drugs and weapons trafficking. It is also a complex crime which often involves other illicit activities. One such crime is money laundering since criminals have to turn their illicit profits into apparently legitimate financial revenue.

As noted above, the ILO estimated that human traffickers make USD 150 billion in profits each year. To manage this capital and facilitate cash transactions, traffickers frequently use electronic funds or prepaid cards. Reloadable prepaid cards are easy to use and less risky to carry, and other electronic cash transfer services allow traffickers to move profits across borders. An emerging trend is the use of “virtual wallets” such as “True Money”, which are difficult for law enforcement to detect and trace because money can be loaded at any convenience store and transferred easily between accounts. In Thailand, for example, one agency has identified several recent cases where traffickers used True Money wallets to purchase and sell child pornography undetected.⁷²

Use of cryptocurrency to move criminal proceeds and receive payments for illicit services is increasingly common. Europol estimated in its 2015 report on Internet organized crime that 40% of intra-criminal traffic takes place in Bitcoin.⁷³ Although the report does not provide specific statistics on the use of cryptocurrency in human trafficking cases, other reports have shown that, to funnel their illicit proceeds, human traffickers not only use cash, retail payment systems and online payment systems, but also cryptocurrencies.⁷⁴ For example, in the case of trafficking children for the purpose of sexual exploitation through live streaming, viewers of the illegal content often use cryptocurrency as payment to hide their identity to traffickers and law enforcement alike, reducing their chances of being identified.

Cryptocurrencies such as Bitcoin and Altcoin allow traffickers to distribute funds across many actors in their criminal networks. This can be difficult to trace since such cryptocurrencies exist entirely in electronic form, independent of a central bank and without the need to be linked to a verified identity. While all cryptocurrency transactions are recorded in a blockchain platform, this ledger records transactions and data changes, but not necessarily identification information.

To convert a cryptocurrency into cash or electronic funds that can be transferred to a bank account, for example through Coinbase, identification is required. To circumvent this problem, criminals use various methods, such as: (1) Bitcoin mixers (also known as “tumblers”), which split currency into smaller bits before recombining;⁷⁵ (2) unregulated exchanges, or (3) online gambling services, mimicking one of the ways hard cash is laundered.

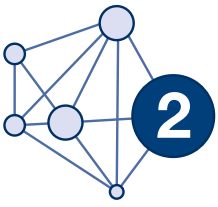
As with the recruitment of victims, the Internet offers anonymity to many of those involved in the trafficking ecosystem when it comes to the financial aspects of the crime, including both the traffickers and the buyers who do not actually need to come into direct contact with the trafficking network when transferring funds. These developments present challenges to both law enforcement authorities fighting human trafficking and anti-money laundering institutions. Without efficient policies and regulations, proper training on the use of cryptocurrencies and co-operation between relevant authorities, identifying these transactions and using them as evidence in court will remain a considerable challenge.

⁷² See Nanchanok Wongsamuth, “Thai child trafficker sentenced to record 374 years in jail” [website] (Reuters, 17 October 2019). Available at: www.reuters.com/article/us-thailand-trafficking-crime/thai-child-trafficker-sentenced-to-record-374-years-in-jail-idUSKBN1WW1KH (accessed 8 May 2020).

⁷³ See Europol, *Internet Organised Crime Threat Assessment (IOCTA) 2015* (The Hague: Europol, 2015), p. 46.

⁷⁴ See the Financial Action Task Force (FATF) and the Asia/Pacific Group on Money Laundering (APG), *Financial Flows from Human Trafficking* (Paris: FATF - APG, July 2018), p. 23.

⁷⁵ See Usman W. Chohan, “The Cryptocurrency Tumblers: Risks, Legality and Oversight”, *Law and Society: Private Law – Financial Law Journal* (Social Science Research Network, 30 November 2017), p. 1.



2 Mapping the landscape of technology tools used in the OSCE area and beyond to counter human trafficking: Research findings

While acknowledging the importance of understanding the use of technology by traffickers and developing efficient responses to curb the misuse of technology, it is equally — or even more — important to learn how technology can be used to fight human trafficking. In this spirit, this chapter analyses which technology tools and initiatives have been developed in the OSCE area and beyond, which trafficking types these technology tools and initiatives aim to counter, and how anti-trafficking groups have been utilizing technology tools.

Tech Against Trafficking,⁷⁶ one of the co-authors of this publication, conducted, in partnership with the Office of the OSCE Special Representative and Co-ordinator to Combat Trafficking in Human Beings (OSR-CTHB), the Global Initiative Against Transnational Organized Crime (GI-TOC)⁷⁷ and other organizations, a global landscape mapping of technology tools developed to combat human trafficking. This chapter will give an overview analysis of the 305 technology tools that have been identified and compiled by Tech Against Trafficking, with support from the OSR-CTHB, as of December 2019.⁷⁸

For the purposes of this publication, the identified tech initiatives are referred to as technology-based solutions, or ‘tools’, acknowledging that there are different levels of complexity to the technology being used, and different initiatives rely on technology to varying degrees. The publication does not cover more general tools used by law enforcement in combating crime, such as phone-reading equipment or instruments to identify document fraud, instead focusing only on those tools that are specific to combatting trafficking in human beings. Given the publication’s scope, the overview analysis also does not cover the tools’ impact assessment, which requires a separate, more in-depth study and evaluation process.⁷⁹

As part of the landscape mapping of existing technology solutions to trafficking, Tech Against Trafficking’s

Research Lead — the RESPECT initiative, managed and led by GI-TOC, has compiled and populated data from multiple sources including those of OSR-CTHB, World Business Council for Sustainable Development, Business for Social Responsibility, GI-TOC, Salesforce.org and Unseen UK in 2018. Given the differences in categorisation of multiple datasets, Tech Against Trafficking developed a category framework in which all the information can be consistently entered and populated. Desk research and additional outreach activities were carried out during the second half of 2018 and first half of 2019 respectively, to further identify technology tools developed and used in the Global South, as well as in other languages than English, in order to have a more comprehensive picture of the current gaps and challenges of technologies used in the field.

a. Technology tools overview

i. General overview

Trafficking in human beings has many forms, including trafficking for sexual and labour exploitation, for forced criminal activity, begging or forced marriages, removal of organs, and trafficking of children for use as child soldiers. Some of these trafficking forms, for example forced marriage and forced conscription of children, are not explicitly mentioned in the UN’s Trafficking in Persons Protocol but have been recognized by many OSCE participating States as forms of trafficking in their national legislation and also in international legal instruments such as the ILO Convention 182 on the Worst Forms of Child Labour. Compared to sex trafficking or forced labour, the number of victims and cases reported for trafficking for other purposes are far fewer, partly because the reporting of such trafficking forms and cases depends on whether they are legally recognized and criminalized in the respective country’s legislative framework.⁸⁰ Consequently, perhaps reflecting regional and national legal frameworks and the aim of

⁷⁶ See Tech Against Trafficking, “Companies Collaborating with Global Experts to Help Eradicate Human Trafficking Using Technology” [website] (Tech Against Trafficking). Available at: www.techagainstrafficking.org/ (accessed 8 May 2020). Tech Against Trafficking member companies include: Amazon, AT&T, BT, Microsoft, and Salesforce.org.

⁷⁷ See Global Initiative Against Transnational Organized Crimes, “Who we are” [website]. Available at: www.globalinitiative.net/about-us/who-we-are/ (accessed 8 May 2020).

⁷⁸ See Annex 1 for the detailed list of technology tools.

⁷⁹ With the generous support from the Steering Committee and Advisory Group, Tech Against Trafficking successfully conducted impact assessments and evaluations of 196 tools as of 2019 – the results of which helped TAT in developing and shaping its pilot Accelerator Programme in 2019, designed to scale up selected tech tools’ impact on anti-trafficking efforts. More information at www.techagainstrafficking.org/accelerating-toward-data-in-sights-tech-against-trafficking-successfully-concludes-its-pilot-accelerator/.

⁸⁰ See UNODC, *Global Report on Trafficking in Persons 2018* (Vienna: UNODC, December 2018), p. 32.

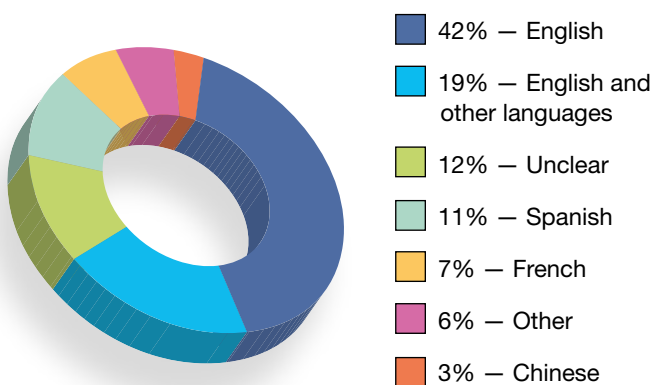
developers to achieve the largest impact possible, most technology tools developed to counter trafficking focus on preventing, reporting and combating trafficking for the purpose of forced labour and sexual exploitation, or supporting the victims of such crimes. This is reflected in the technology tools identified below. Three quarters of these are aimed at countering labour trafficking and sex trafficking, whereas only a fifth of the tools are aimed at other types of trafficking such as trafficking for the purpose of organ removal or conducting illicit activity and petty crimes, begging, child soldiers, etc. In 4% of cases, there is no information on which form of human trafficking the tools are addressing (table 1).

Table 1 – Type of trafficking addressed

Trafficking type	Per cent of tech tools
Labour Trafficking	46%
Sex Trafficking	29%
Other	21%
N/A	4%

Concerning the language(s) available in the identified technology tools, English remains the most widely used language – almost half of the tools are only available in English. One fifth are in both English and other languages, 11% are available in Spanish, 7% in French, and 3% in Chinese. Only 6% are available in other languages (figure 1). The current heavy emphasis on English-language tools can either be due to the networks and linguistic limitations of their developers, or reflect the fact that such tools have primarily been developed in English-speaking areas (most in the Global North), and not in other parts of the world.

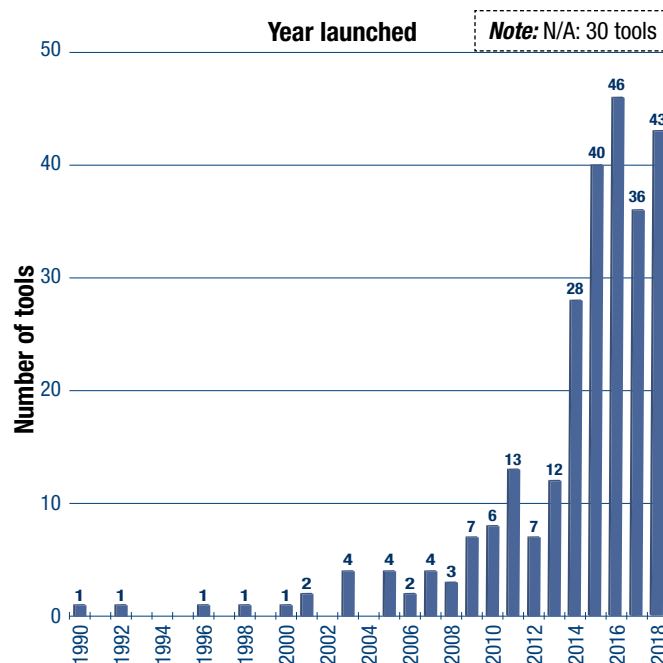
Figure 1 – Language available



As the list of tech solutions becomes more comprehensive and includes more local tech tools and innovations, these percentages are likely to change over time. Moreover, the organizations that have developed these tools tend to expand their linguistic scope to replicate their efforts effectively in multiple locations.

As technology has become more widely accessible over the past decade, the number of Internet and mobile device users has increased, as has the number of technology tools for combatting human trafficking. The number of tools launched prior to 2009 was below five tools per year. Between 2009 and 2013, the number of tools launched increased to nine tools on average per year. In 2014, there was an exponential growth in the number of anti-trafficking tech tools, with 28 tools introduced that year. This growth has then been sustained, with an average of 40 tools being launched each year since (figure 2).⁸¹

Figure 2 – Years in which tech tools were launched



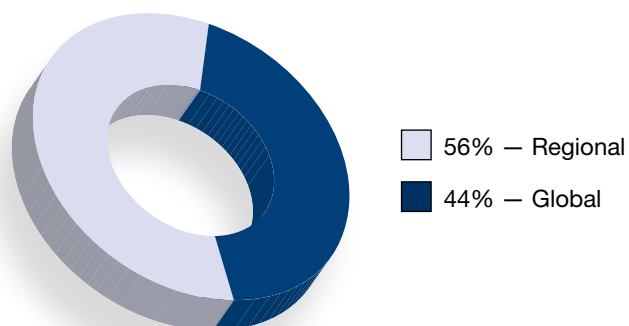
ii. Regional / global coverage

The majority of the tools identified were global in nature, though only by a small degree, with there being a large number of regional tools also available (figure 3). Global tools refer to those which could be used in any part of the world. For example, PhotoDNA from Microsoft could be used by law enforcement from any country to investigate cybersex trafficking of children. Regional technology tools include those which can be used to prevent or combat human trafficking in a specific country or region of the globe. For example, the online platform www.contratados.org focuses on the prevention of human trafficking along the Mexico-U.S. border.

Of the identified tools, a strong concentration of tech tools have been developed and are operating in the Global North, accounting for more than half the tools

⁸¹ Please note that the 11 tools launched in 2019 have been removed from the graph, in order to give a better picture of the trend in anti-trafficking tech tools' creation and development over the years. Since Tech Against Trafficking conducted outreach activities to identify additional tools in the first half of 2019, tech tools which were introduced later in 2019 were not yet identified or included in the list of 305 tools.

Figure 3 — Geographical scope of tools



(figure 4), despite that for some forms of human trafficking the prevalence rates are higher in the Global South.⁸²

Given the potential efficacy and wide coverage of technology, it seems natural to assume that priority and attention should be given to developing more technological solutions for combating human trafficking in the Global South. However, efforts and attempts to address the limited availability of anti-trafficking tech tools in developing regions should be based on an assessment of current technological infrastructure, as well as local target users' Internet and digital literacy, since countries from the Global South have the lowest Internet penetration rates globally, below that of the world's average, with Middle Africa ranking last at 12% as of January 2019.⁸³

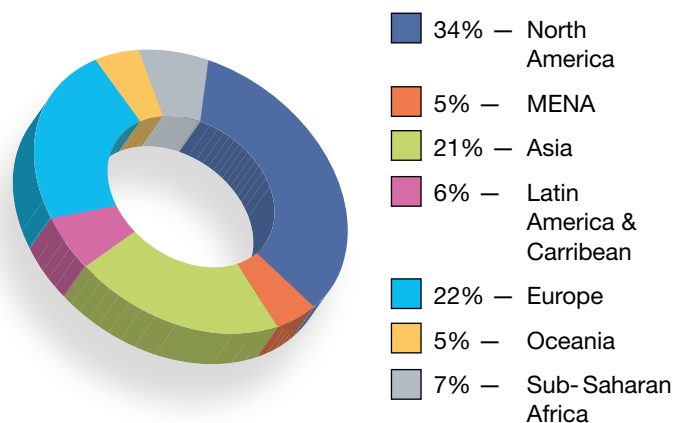
As stated by John Richmond, United States Ambassador-at-Large to Monitor and Combat Trafficking in Persons and Director of the U.S. Department of State's Office to Monitor and Combat Trafficking in Persons, in his keynote speech at the OSCE's 19th Alliance against Trafficking in Persons Conference in April 2019: *"If our innovations are to be successful, they have to begin with a clear need. (...) We need to understand the tech contexts and ask the question: What is the technological infrastructure of the area where people will be using our tech innovation?"*⁸⁴

iii. Tool types

The 305 tech tools identified by authors of this publication can be classified according to their primary goals, namely:

- Victim / Trafficker Identification
- Awareness-raising, Education, Collaboration

Figure 4 — Region of operation



- Supply Chain Management
- Data Trends and Mapping
- Corporate Risk Identification
- Worker Engagement and Empowerment
- Victim Case Management and Support
- Ethical Shopping
- Privacy / Personal Identity
- Payment Security
- Other

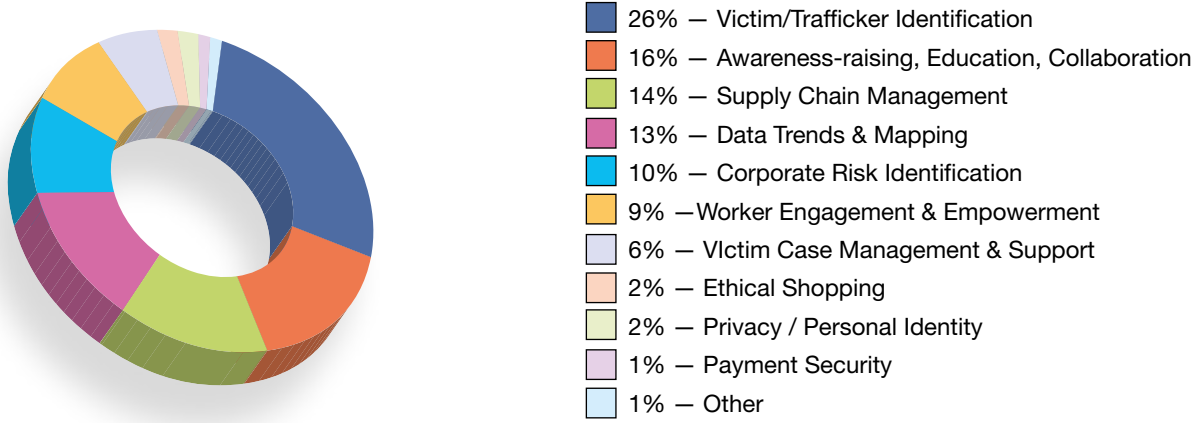
Although most types of tools are quite different and can be easily distinguished by the reader, some types can be similar in nature and need additional explanation, such as Supply Chain Management and Corporate Risk Identification. Tools included in the Supply Chain Management category are mostly focused on the traceability and provenance of goods purchased by a company and on knowing the movement of goods from the lowest tier of supply all the way up the supply chain. A concrete example would be a blockchain tool which tracks the movement of fish from bait-to-plate to ensure that no trafficking took place in this particular fishing supply chain. Tools included in the Corporate Risk Identification category mostly focus on assessing the probability of risk of human trafficking in companies' operations. In order to determine risk, these tools analyse a set of variables such as country and industry risk indicators, companies' due diligence policies and frameworks, worker engagement mechanisms and training of employees on human trafficking. These tools do not always focus on human trafficking risks; they can also be more general, looking, for example, at risks of human rights violations in companies' operations. But they could be leveraged to analyse human trafficking risks. Supply Chains Management tools are more THB focused and operational and Corporate Risk Identification ones are more generic and strategy oriented.

⁸² See ILO, IOM and Walk Free Foundation, *Global Estimates of Modern Slavery: Forced Labour and Forced Marriage* (Geneva: ILO, IOM and Walk Free Foundation, 19 September 2017), p. 19.

⁸³ See Statista, "Global internet penetration rate as of January 2019, by region" [website] (Statista, 2019). Available at: www.statista.com/statistics/269329/penetration-rate-of-the-internet-by-region/ (accessed 8 May 2020).

⁸⁴ See OSCE, "19th Alliance against Trafficking in Persons: Opening Session and Keynote Address" [website] (Vienna: OSCE, 2019), from minute 55:53. Available at: www.osce.org/secretariat/417629 (accessed 8 May 2020).

Figure 5 – Anti-trafficking tool type



Among the tools identified, more than a quarter were introduced to identify victims of trafficking or perpetrators of trafficking. Two-thirds of the tools have been developed for various preventive and other purposes, such as Awareness Raising, Supply Chain Management, or Worker Engagement and Empowerment (figure 5). However, it is of great concern that protection tools such as those focusing on Victim Case Management and Support, which assist victims in their reintegration after having been exploited, account for only 6% of all the tools, particularly given that the number of detected victims has been consistently increasing over recent years.⁸⁵

iv. User groups and beneficiaries

Given that approximately a quarter of the identified tools address Supply Chain Management and Corporate Risk Identification (figure 5), it is not surprising that businesses account for a fifth of the tools’ total target users (figure 6). This also stresses the important role that the private sector plays in the fight against human trafficking, especially when exploitation is happening

either in a business’s supply chains, impacting its operations and leading to reputational risks, or “through” the private sector, using businesses as facilitators.⁸⁶

NGOs and law enforcement make up another quarter of users, as do victims and potential victims, which shows that there is a fairly even spread among different categories of tools.

The identified tech tools’ target users are not necessarily their beneficiaries. For example, a tool can be developed for and used by law enforcement and NGOs to identify victims of trafficking, whereby its main beneficiaries are then the identified and supported victims and not the users. Consequently, victims and potential victims account for almost half of the total beneficiaries, which is also in line with the contemporary victim-centred approach of anti-trafficking tools and initiatives (as will be discussed below, p. 34). Interestingly, businesses are among the top three beneficiaries of the identified tools, which supports the reciprocal relationship between the time, effort and commitment businesses invest in preventing and removing traffick-

Figure 6 – Target users

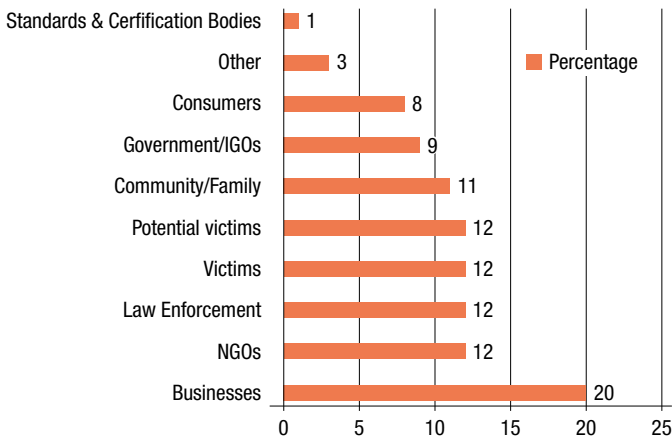
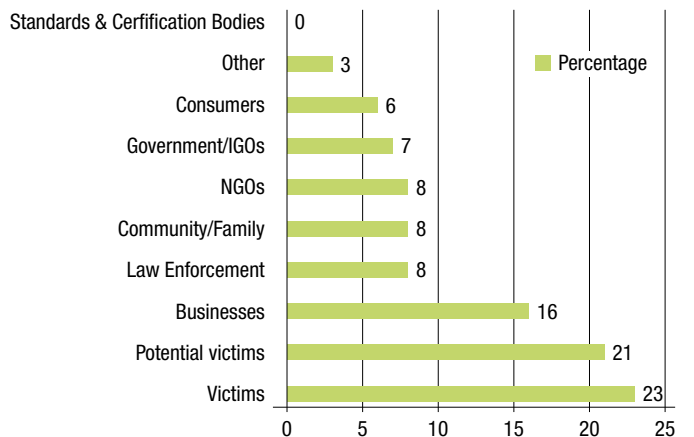


Figure 7 – Target beneficiaries



⁸⁵ See UNODC, *Global Report on Trafficking in Persons 2018* (Vienna: UNODC, December 2018), p. 21.

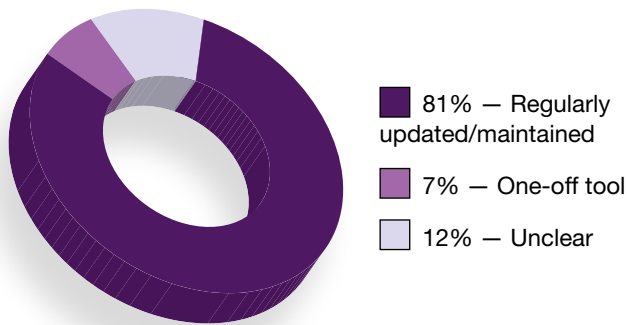
⁸⁶ See Robin Cartwright and Frances Cleland Bones, *Transnational Organized Crime and the Impact on the Private Sector: The Hidden Battalions* (Geneva: The Global Initiative Against Transnational Organized Crime, 2017), p. 10.

ing incidents and practices in their global supply chains and the reputational and material benefits they can gain in return (figure 7).

v. Maintenance and customizability

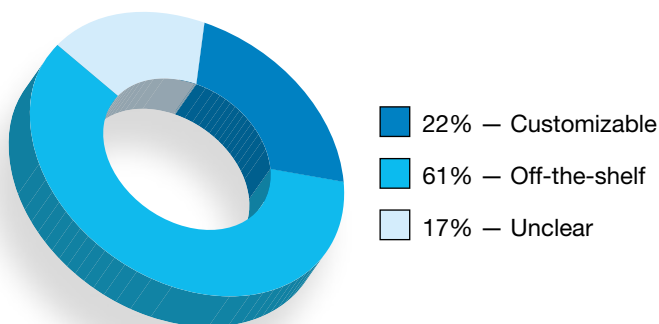
Among the 305 tech tools identified, 81% have been updated and maintained on a regular basis, whereas 7% were developed as “one-off tools” (figure 8). This indicates ongoing efforts from the developers of tools to ensure that they are operational, adapted to the needs of users and relevant to current trends.

Figure 8 – Tool maintenance



Only 22% of the tools allow users to customize them based on their needs, while 61% are “off-the-shelf” (figure 9). This contrast can be further analysed when looking at the breakdown of user groups versus the customizability of the tools (figures 10 and 11).

Figure 9 – Tool customizability



In general, businesses are the top user group of customizable tools, accounting for more than a quarter of all users, followed by law enforcement and NGOs at 17% each. Meanwhile, victims, potential victims, and family and community members account for almost half of those using “off-the-shelf” tools. The reasons behind these differences lie in the nature of technological capabilities, as well as the needs and purchasing power of different user groups. High technology tools used by businesses, such as search engines using machine learning, are often offered as customizable and tailored to the business’ needs. In addition, the private sector is the user group with the highest pur-

Figure 10 – User groups of customizable tools

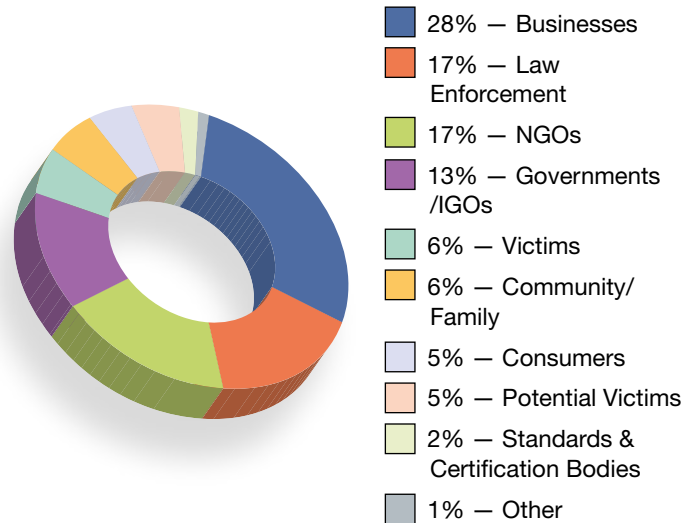
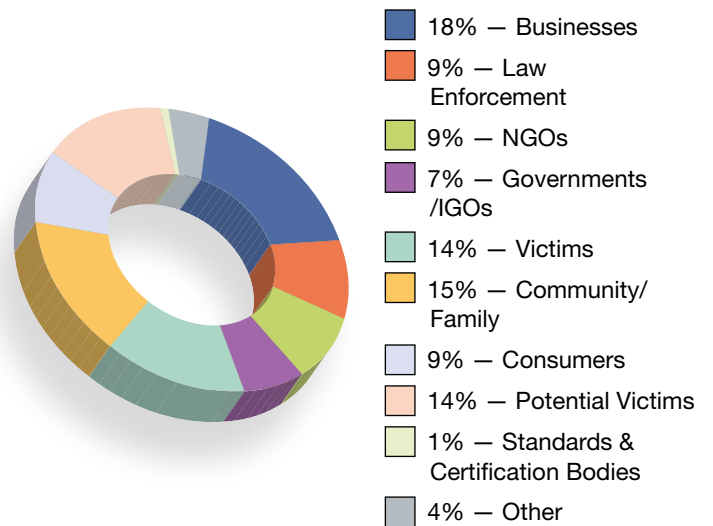


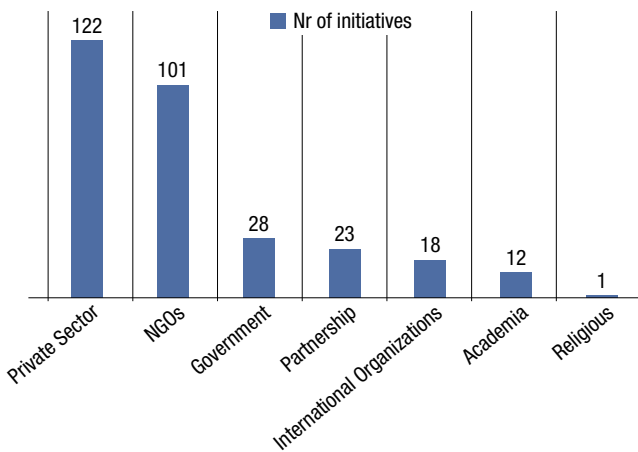
Figure 11 – User groups of off-the-shelf tools



chasing power, allowing them to afford special customization of tools.

In contrast, technology tools used by victims, potential victims and community groups are often simple, low cost and low tech mobile apps (mostly provided for free) that require significantly lower levels of technology / Internet literacy. The simplicity of tools developed for victims indeed corresponds to the primary needs of the victims which often times are to report their precarious situation to NGOs or law enforcement or to seek services, such as shelter, medical and psychological care. Therefore, these needs have to be addressed in the simplest and least costly way. Moreover, victims and potential victims have usually access to basic technological devices, such as a smartphone or simple phones, therefore, tools they need to use to receive support and assistance have also to be basic and easy to use. A detailed breakdown of technologies and their respective user groups will be provided below (see p. 30).

Figure 12 – Nr of initiatives

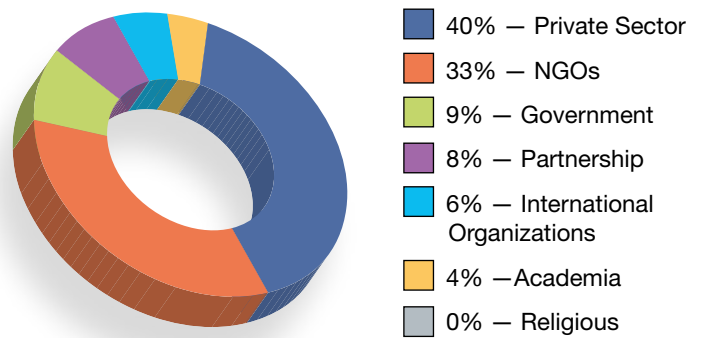


b. The developers of tools

Analysis was made of the organizations that are behind the development of technology tools to combat trafficking in human beings in order to better understand what sectors are engaged in technology development in the context of human trafficking. As shown in figures 12 and 13, the private sector was the most active stakeholder, developing 40% of identified tools. From a capacity perspective, this was to be expected since the private sector companies possess the technology knowledge, expertise and resources needed for the development of anti-trafficking tools. At the same time, since combating THB is not a typical business function, it is likely that the private sector is relying on the knowledge and expertise of other sectors such as civil society or law enforcement when developing technology tools. In this regard, knowing where the development is happening is crucial to understanding the partnerships that are central to harnessing the positive power of technology in combating trafficking in human beings.

NGOs also play an important role in the development of technology tools to combat human trafficking, developing 33% of the tech tools identified by the authors of this publication. For the purpose of this analysis, the term NGOs includes non-governmental organizations, non-profits, charities, public interest organizations and various foundations. This finding goes against common expectations that most anti-trafficking NGOs do not have the technology expertise, capacity and resources needed to develop and maintain tools such as software, applications, websites. Analysis of individual tools developed by NGOs also reveals that most of them receive funding or support from either governments or private sector companies, giving them the extra resources they require to develop solutions. For example, the Unseen App in the UK was developed with the support of the BT Group and the Project Intercept in

Figure 13 – Developers of tools



Seattle was developed by the NGO Seattle Against Slavery with support of Microsoft software engineers.

Governments are behind the development of only 9% of technology tools and initiatives identified by this publication. The term governments includes both central and local authorities. This outcome was not expected since the main obligation to fight human trafficking falls on governments and state institutions and thus one might assume that governments would be more active in developing technology tools to fight human trafficking.

Another group of developers involved in developing technology tools to combat human trafficking is “partnerships”. In this context, partnership, refers to tools developed jointly by different categories of stakeholders working together. This can include, for example, private sector and NGOs or government and NGOs or international organizations and private sector firms. The term partnership here does not refer to two or more entities from the same category, for example an NGO working together with another NGO. One concrete example of a successful partnership is “The Interactive Map for Business of Anti-Human Trafficking Organisations” which is a tool developed by the Global Business Coalition Against Trafficking, the Responsible and Ethical Private Sector Coalition against Trafficking (RESPECT) initiative, managed and led by the Global Initiative Against Transnational Organized Crime and the United Nations Global Compact with support from Alliance 8.7, BSR, and the International Labour Organization’s (ILO) Global Business Network on Forced Labour and Human Trafficking.⁸⁷ It thus represents a tool that has been formed through collaborative work between NGOs and international organizations.

Other stakeholders involved in developing technology tools include international organizations (6%), academia (4%) and religious groups.

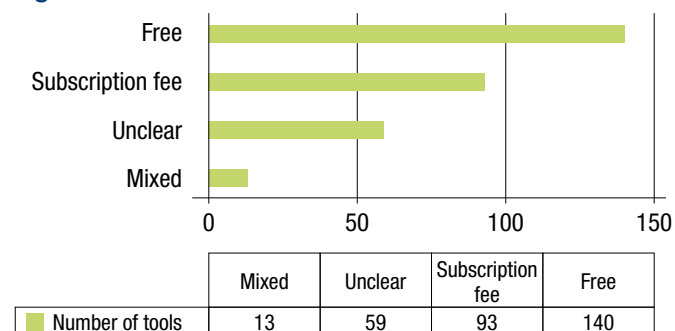
⁸⁷ See Modern Slavery Map, “The Interactive Map for Business of Anti-Human Trafficking Organisations” [website] (the Global Business Coalition Against Trafficking, the Responsible and Ethical Private Sector Coalition against Trafficking (RESPECT) and the United Nations Global Compact). Available at: www.modernslaverymap.org (accessed 8 May 2020).

The main finding of this analysis is that the private sector and NGOs account for 73% of technology tools to fight human trafficking, with governments playing a less active role than originally anticipated. The burgeoning work of partnerships across sectors to develop tech tools is also noted.

c. Business model and sector focus

Of the 305 tech tools identified, almost half are available for free and one third are offered at a subscription fee (figure 14). The high number of free tech tools developed to counter trafficking is encouraging and a valuable resource for all anti-trafficking stakeholder groups.

Figure 14 – Tool cost to users



As the user group with the highest purchasing power, businesses account for almost half of the user groups who pay to use anti-trafficking technology tools (figure 15). It is worth noting that victims and potential victims are also using paid tools – which range from tools providing payment security⁸⁸ to tools giving voice to workers and forced labourers in ways which they can safely share and raise concerns about their exploitative working conditions. The latter are often paid by businesses which want to improve transparency and eradicate human trafficking in their global supply chains – workers can then use the tools at no additional costs. The

Figure 15 – User groups of paid tools

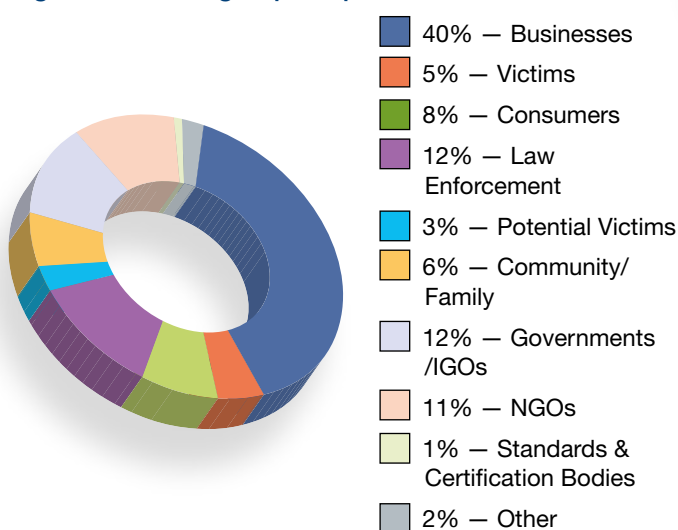
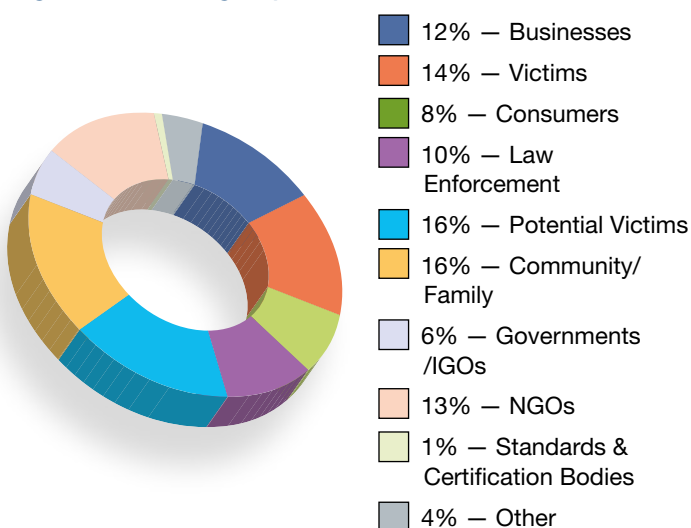


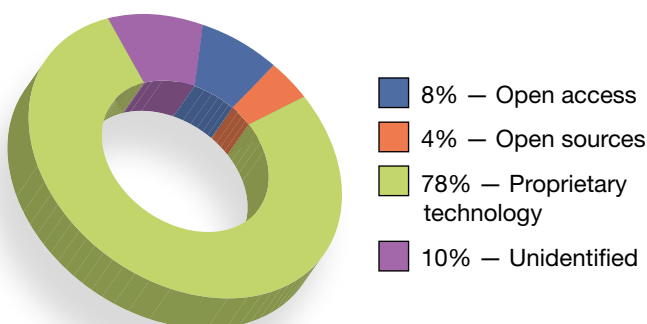
Figure 16 – User groups of free tools



former, however, raise the question if these vulnerable groups should be able to use technology free of charge given their difficult situation, including lack of financial resources. The necessity to pay for the use of tools might deter victims from using technology to escape their exploitative situation and seek help. There is an approximately even distribution of the user groups who use free tools (figure 16).

Although half of the tools are offered at no cost, the majority (more than three quarters) are proprietary technologies / innovations; only 12% are open access and open source (figure 17).

Figure 17 – Tool ownership



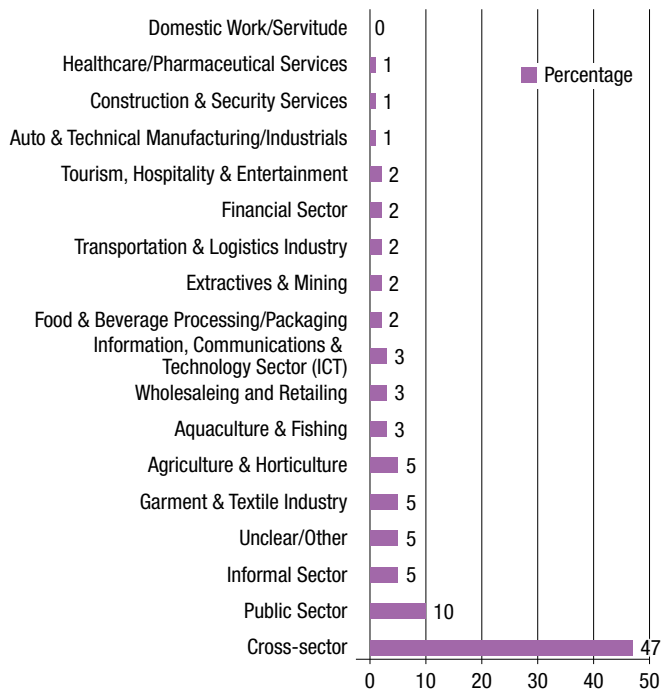
There is an observable trend in the development of tools, to be applicable to as many industry sectors as possible: almost half of the tools work across sectors, with the other half working in specific industries, including the garment, agriculture and ICT industries (figure 18).

d. Technologies and the respective user groups

There are four major technology types, making up three quarters of all the identified tools: one third of the

⁸⁸ Payment security tools refers to any technology tool designed to ensure that workers, including those in the global supply chains, are paid for their work.

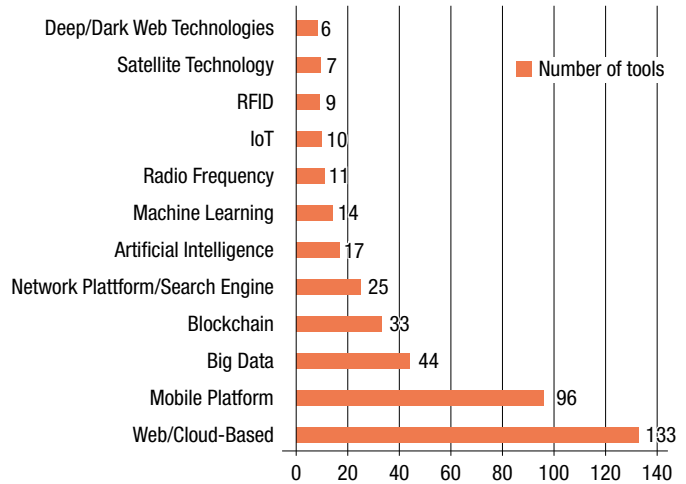
Figure 18 – Sector Focus



tools use *web/cloud-based technologies*, most notably online resource portals, followed by a quarter being *mobile apps and platforms*, followed by *big data* and *blockchain* technologies at 11% and 8% respectively (figure 19).

Of the four most used technologies, victims, potential victims and community members are the top users (59 %) of mobile apps and platforms. Businesses remain

Figure 19 – Technologies used⁸⁹



the top user group for the remaining three technologies, especially accounting for almost half of the blockchain technology tools’ user base, and 21% for both web/cloud-based and big data tech tools (table 2). The analysis shows that most tools use a combination of technologies while few tools use only one type of technology.

e. Trafficking types and their geographical coverage and breakdowns

More than half of the identified tech tools developed to counter labour trafficking target users worldwide, whereas tools against sex trafficking focus more on the regional level (figures 20 and 21).

Table 2 – Target / primary users of the top four technologies⁹⁰

Web-/cloud-based	Per cent	Mobile apps	Per cent	Big data	Per cent	Blockchain	Per cent
Businesses	21	Victims	20	Businesses	21	Businesses	46
NGOs	15	Potential victims	20	Law Enforcement	20	Consumers	16
Law Enforcement	12	Community/Family	19	NGOs	19	Government/IGOs	12
Government/IGOs	11	Businesses	14.5	Government/IGOs	14	Victims	5
Community/Family	10	Consumers	7.5	Potential victims	6	Community/Family	5
Potential victims	10	NGOs	7	Victims	6	NGOs	5
Victims	9	Other	5	Consumers	5	Law Enforcement	4
Consumers	8	Law Enforcement	4	Community/Family	5	Potential victims	4
Other	3	Government/IGOs	2	Standards & Certification Bodies	2	Standards & Certification Bodies	2
Standards & Certification Bodies	1	Standards & Certification Bodies	1	Other	2	Other	2

⁸⁹ Technology definitions can be found in Annex II.

⁹⁰ With the top target / primary users of each respective technology (accounting for more than 10 %) highlighted in red. The rest are in blue.

Figure 20 – Geographical coverage of anti-labour trafficking tools

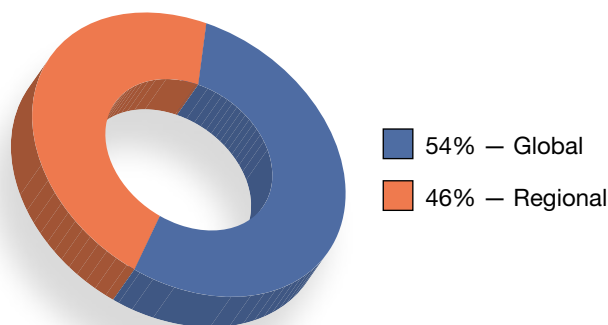
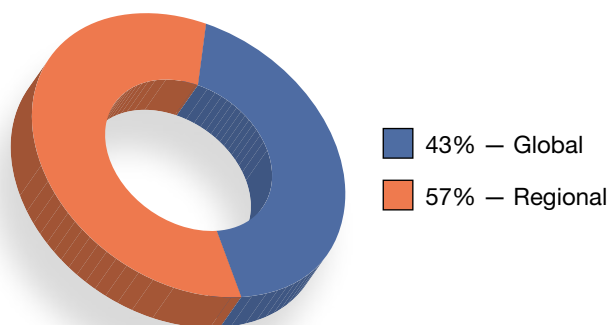


Figure 21 – Geographical coverage of anti-sex trafficking tools

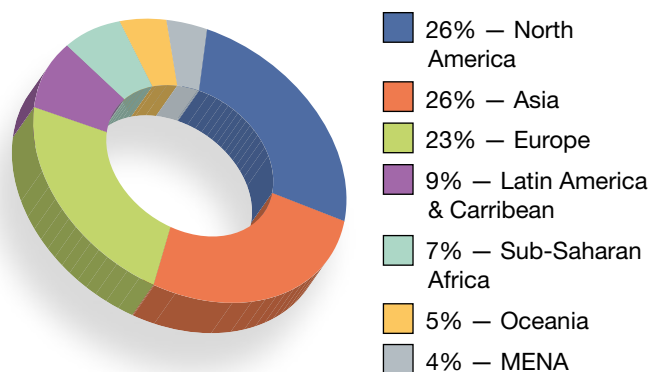


The global coverage of anti-labour trafficking tech tools corresponds to the global nature of today’s supply chains. In contrast, the regional focus of anti-sex trafficking tools might be explained by the various regional / national perceptions and legislative approaches toward sexual exploitation and prostitution (with the exception of child sexual exploitation).

With regard to the regional focus of anti-labour trafficking tools, the Global North (North America, Europe and Oceania) accounts for half of the regional breakdown, meaning there are more tech tools developed in and for the Global North than those for the Global South (tools for the Latin America and Caribbean, Sub-Saharan Africa and MENA [Middle East and North Africa] regions make up a total of only 20% of the regional focus) (figure 22). It is also worth mentioning that North America and Europe account for almost half of all tools (49%).

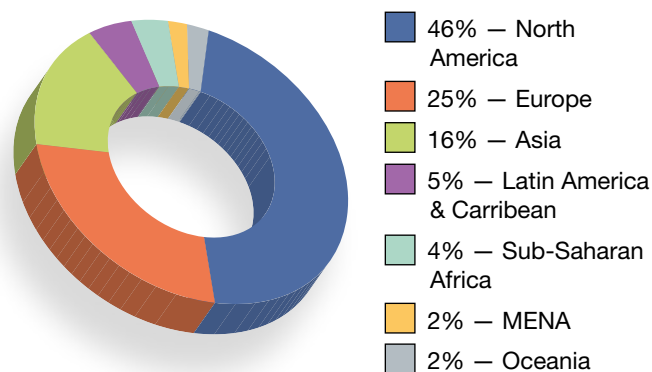
Regarding the regional focus of tools against sex trafficking, there is an even greater concentration of tech tools developed in and for the Global North regions:

Figure 22 – Regional breakdown of anti-labour trafficking tools



almost three quarters of the tools focus on and operate in North America and Europe (figure 23), which is in line with previous analysis that human trafficking for sexual exploitation is the main form of exploitation in North America and Europe.⁹¹

Figure 23 – Regional breakdown of anti-sex trafficking tools



In regards to tool type (based on the tools’ primary goals), Supply Chain Management and Corporate Risk Identification make up more than one third of anti-labour trafficking tech tools (table 3). This trend corresponds to the recently tightened legislative requirements for companies headquartered and/or operating in the Global North countries, notably California’s Transparency in Supply Chains Act of 2010,⁹² the United Kingdom’s Modern Slavery Act of 2015,⁹³ France’s Duty of Vigilance Law of 2017,⁹⁴ and most recently Australia’s Modern Slavery Act of 2018.⁹⁵

On the other hand, Victim / Trafficker Identification and Awareness-raising, Education, Collaboration account for almost two thirds of the anti-sex trafficking tech tool types identified (table 3).

⁹¹ See UNODC, *Global Report on Trafficking in Persons 2018* (Vienna: UNODC, December 2018), p. 10.

⁹² For more information about the California Transparency in Supply Chains Act please visit State of California Department of Justice website www.oag.ca.gov/SB657 (accessed 8 May 2020).

⁹³ For more information about the UK Modern Slavery Act 2015 please visit the UK Home Office website www.legislation.gov.uk/ukpga/2015/30/contents/enacted (accessed 8 May 2020).

⁹⁴ For more information about the French Duty of Vigilance Law 2017 please visit www.legifrance.gouv.fr/eli/loi/2017/3/27/2017-399/jo/texte (accessed 8 May 2020).

⁹⁵ For more information about the Australia Modern Slavery Act 2018 please visit www.legislation.gov.au/Details/C2018A00153 (accessed 8 May 2020).

Table 3 – Tool type of anti-labour and sex trafficking tools⁹⁶

Anti-labour trafficking tool type	Per cent	Anti-sex trafficking tool type	Per cent
Supply Chain Management	20	Victim / Trafficker Identification	39
Awareness-raising, Education, Collaboration	18	Awareness-raising, Education, Collaboration	22
Corporate Risk Identification	15	Data Trends & Mapping	16
Worker Engagement & Empowerment	13	Victim Case Management & Support	11
Victim / Trafficker Identification	11	Other	7
Data Trends & Mapping	9	Privacy / Personal Identity	2
Victim Case Management & Support	7	Supply Chain Management	1
Ethical Shopping	3	Payment Security	1
Payment Security	1	Corporate Risk Identification	1
Privacy / Personal Identity	1		
Other	1		

f. Anti-trafficking tool types and their target users

To make sure that technology tools represent a needed intervention, it is vital to analyse the target user / tool type relationship of the 305 tech tools identified, and understand the bigger picture of which tool type (classified based on their countering trafficking purposes) has been used most frequently by different stakeholder groups.

Table 4 “Tool type vs. Target / primary user”, provides an overview, with the users of each tool type ordered and highlighted by frequency of use (in per cent). This illustrates which groups rely on each category of tools the most.

- **Victim / Trafficker Identification**

Mostly used by law enforcement (to identify traffickers, rescue victims and investigate trafficking incidents), community members, victims and potential victims, as well as NGOs (to report trafficking cases and rescue victims)

- **Awareness-raising, Education, Collaboration**

Mostly targeted at potential victims coming from vulnerable communities (low socio-economic status) or groups (women and children)

- **Supply Chain Management**

Mostly targeted at and used by businesses to prevent trafficking and remove it from their global supply chains

- **Data Trends & Mapping**

Mostly targeted at and used by law enforcement and

NGOs to understand where trafficking occurs, trafficking routes and flows, as well as criminals’ profiles, networks and modus operandi

- **Corporate Risk Identification**

Similar to that of Supply Chain Management tools, this tool type is mostly targeted at and used by businesses to identify human trafficking indicators and red flags in their global supply chains

- **Worker Engagement & Empowerment**

Mostly targeted at victims or potential victims – especially low-skilled workers who might be susceptible to trafficking- to raise awareness and knowledge about labour rights, as well as to support them in self-organizing and mobilizing their own voice, rights, collaborations and movement in the digital space

- **Victim Case Management & Support**

Mostly used by anti-trafficking and victim assistance NGOs

- **Ethical Shopping**

Mostly targeted at and used by consumers

- **Privacy / Personal Identity**

Evenly used by a variety of stakeholders for different purposes (for example, by victims anonymously seeking assistance)

- **Payment Security**

Mostly initiated and used by businesses to increase security and transparency in workers’ payments

⁹⁶ With the top tool types of each respective anti-trafficking tool (accounting for more than 10 per cent) highlighted in red and the rest in blue.

Table 4 – Tool type vs. Target / primary user

Tool type (from most % to least)	Victim / Trafficker Identification	Awareness-raising, Collaboration	Supply Chain Management	Data Trends & Mapping	Corporate Risk Identification
Stakeholder group who would use the tool the most (>20%)	Law Enforcement	Potential victims	Businesses	Law Enforcement	Businesses
	Community/Family	Community/Family	Consumers	NGOs	Consumers
Stakeholder group who would also use the tool (10%–20%)	Potential Victims	Businesses	Government/IGOs	Businesses	Government/IGOs
	NGOs	Victims	NGOs	Government/IGOs	NGOs
	Victims	NGOs	Victims	Consumers	Victims
	Businesses	Consumers	Community / Family	Community / Family	Standards & Certification Bodies
Stakeholder group who would rarely use the tool (<10%)	Government / IGOs	Government / IGOs	Law Enforcement	Potential victims	Law Enforcement
	Consumers	Other	Other	Victims	Community / Family
Stakeholder group who would never use the tool (=0%)	Other	Law Enforcement	Standards & Certification Bodies	Other	Potential victims
	Standards & Certification Bodies	Standards & Certification Bodies	Potential victims	Standards & Certification Bodies	Other

g. Stakeholder groups and the specific tools they use

After analysing the use levels of different tools by user groups, it is equally crucial to study anti-trafficking stakeholder groups’ needs in order to identify trends in the type of tools each of them use more often. Table 5, “Stakeholder group vs. Tool type”, gives an overview of this, by organizing the most used tools by user group.

- **Businesses**
Trends: mostly use Supply Chain Management and Corporate Risk Identification tools
- **NGOs**
Trends: mostly use Victim / Trafficker Identification and Data Trends & Mapping tools
- **Law Enforcement**
Trends: similar to the NGO group, mostly use Victim

/ Trafficker Identification and Data Trends & Mapping tools

- **Victims**
Trends: mostly use Victim / Trafficker Identification and Worker Engagement & Empowerment tools
- **Potential victims**
Trends: mostly use Victim / Trafficker Identification and Awareness-raising, Education, Collaboration tools
- **Community/Family**
Trends: similar to the potential victims group, mostly use Victim / Trafficker Identification and Awareness-raising, Education, Collaboration tools
- **Government/IGOs**
Trends: mostly use Data Trends & Mapping and Victim / Trafficker Identification tools

Worker Engagement & Empowerment	Victim Case Management & Support	Ethical Shopping	Privacy / Personal Identity	Payment Security	Tool type (from most % to least)
Victims	NGOs	Consumers	Businesses	Businesses	Stakeholder group who would use the tool the most (>20%)
Potential Victims	Victims	Businesses	Victims	Victims	
Businesses	Potential victims	Community/ Family	Potential victims	Potential victims	Stakeholder group who would also use the tool (10%-20%)
Other	Government/ IGOs	Government/ IGOs	Government/ IGOs	Community/ Family	
Community / Family	Law Enforcement	Victims	Consumers	Consumers	
NGOs	Community / Family	Law Enforcement	Law Enforcement	Government / IGOs	
Consumers	Businesses	Potential victims	Community / Family	NGOs	Stakeholder group who would rarely use the tool (<10%)
Government / IGOs	Consumers	NGOs	NGOs	Other	
Law Enforcement	Standards & Certification Bodies	Standards & Certification Bodies	Other	Law Enforcement	Stakeholder group who would never use the tool (=0%)
Standards & Certification Bodies	Other	Other	Standards & Certification Bodies	Standards & Certification Bodies	

- **Consumers**

Trends: mostly use Supply Chain Management and Awareness-raising, Education, Collaboration tools. It is surprising that Ethical Shopping tools are not the top tool type used by consumers. However, it is worth noting that only 2% of the tools have been identified for “ethical shopping” purposes. This lack of Ethical Shopping tools might explain why they are not the top tool type used by consumers, despite the fact that the top user group of Ethical Shopping tools are indeed consumers (table 4)

- **Other**

Trends: other stakeholders including youth, women or workers, mostly use Awareness-raising, Education, Collaboration and Worker Engagement & Empowerment tools

- **Standards & Certification Bodies**

Trends: mostly use Corporate Risk Identification tools

h. Gaps in the use of tools by different stakeholder groups

Beyond understanding the tools being used by different stakeholder groups, another extremely important analysis is in identifying which tools are not being utilized by a particular group of stakeholders as often as their role in combating trafficking in human beings would dictate. In this section, the analysis focuses on identifying these gaps in the use of tech tools with the purpose of advising stakeholders on possible areas of focus for future interventions and activities.

The following gaps can be highlighted based on the analysis conducted by this publication:

- **Businesses**

Limited use of tech tools focusing on Worker Engagement & Empowerment and Victim Case

Table 5 – Stakeholder group vs. Tool type

Stakeholder (from most % to least)	Businesses	NGOs	Law Enforcement	Victims	Potential Victims
Tool type which is used the most by the stakeholder (>20%)	Supply Chain Management	Victim / Trafficker Identification	Victim / Trafficker Identification	Victim / Trafficker Identification	Victim / Trafficker Identification
	Corporate Risk Identification	Data Trends & Mapping	Data Trends & Mapping	Worker Engagement & Empowerment	Awareness-raising, Education, Collaboration
Tool type which is also used by the stakeholder (10%–20%)	Victim / Trafficker Identification	Awareness-raising, Education, Collaboration	Awareness-raising, Education, Collaboration	Awareness-raising, Education, Collaboration	Worker Engagement & Empowerment
	Data Trends & Mapping	Victim Case Management & Support	Victim Case Management & Support	Victim Case Management & Support	Victim Case Management & Support
	Awareness-raising, Education, Collaboration	Supply Chain Management	Supply Chain Management	Data Trends & Mapping	Data Trends & Mapping
Tool type which is rarely used by the stakeholder (<10%)	Worker Engagement & Empowerment	Corporate Risk Identification	Other	Supply Chain Management	Payment Security
	Victim Case Management & Support	Other	Corporate Risk Identification	Payment Security	Privacy / Personal Identity
	Ethical Shopping	Worker Engagement & Empowerment	Privacy / Personal Identity	Corporate Risk Identification	Supply Chain Management
	Payment Security	Payment Security	Worker Engagement & Empowerment	Privacy / Personal Identity	Corporate Risk Identification
Tool type which is never used by the stakeholder (=0%)	Privacy / Personal Identity	Privacy / Personal Identity	Payment Security	Ethical Shopping	Ethical Shopping
	Other	Ethical Shopping	Ethical Shopping	Other	Other

Management & Support tools (which are at 6% and 3% of all tool types used by businesses respectively)

• **NGOs**

Limited use of tech tools focusing on Victim Case Management & Support tools (which stand at 13% of all tool types used by / available to NGOs)

• **Law Enforcement**

Limited use of tech tools focusing on Awareness-raising, Education, Collaboration and Victim Case Management & Support tools (8% and 7% respectively)

• **Victims**

Limited use of tech tools focusing on Victim Case Management & Support tools (12%)

• **Potential victims**

Limited use of tech tools focusing on Worker Engagement & Empowerment tools (14%), especially to the potential victims of labour exploitation

• **Community/Family**

Limited use of tech tools focusing on Data Trends & Mapping, Worker Engagement & Empowerment tools and Ethical Shopping tools (8%, 4% and 3%, respectively)

Community / Family	Government / IGOs	Consumers	Other (workers, youth, etc.)	Standards & Certification Bodies	Stakeholder (from most % to least)
Victim / Trafficker Identification	Data Trends & Mapping	Supply Chain Management	Awareness-raising, Education, Collaboration	Corporate Risk Identification	Tool type which is used the most by the stakeholder (>20%)
Awareness-raising, Education, Collaboration	Victim / Trafficker Identification	Awareness-raising, Education, Collaboration	Worker Engagement & Empowerment	Data Trends & Mapping	
Data Trends & Mapping	Awareness-raising, Education, Collaboration	Corporate Risk Identification	Data Trends & Mapping	Awareness-raising, Education, Collaboration	Tool type which is also used by the stakeholder (10%–20%)
Victim Case Management & Support	Supply Chain Management	Victim / Trafficker Identification	Supply Chain Management	Supply Chain Management	
Supply Chain Management	Victim Case Management & Support	Data Trends & Mapping	Victim / Trafficker Identification	Victim Case Management & Support	
Worker Engagement & Empowerment	Corporate Risk Identification	Ethical Shopping	Victim Case Management & Support	Victim / Trafficker Identification	Tool type which is rarely used by the stakeholder (<10%)
Ethical Shopping	Privacy / Personal Identity	Victim Case Management & Support	Payment Security	Payment Security	
Payment Security	Worker Engagement & Empowerment	Worker Engagement & Empowerment	Corporate Risk Identification	Worker Engagement & Empowerment	
Corporate Risk Identification	Payment Security	Privacy / Personal Identity	Privacy / Personal Identity	Ethical Shopping	
Privacy / Personal Identity	Ethical Shopping	Payment Security	Ethical Shopping	Other	Tool type which is never used by the stakeholder (=0%)
Other	Other	Other	Other	Privacy / Personal Identity	

- **Government/IGOs**

Limited use of tech tools focusing on Awareness-raising, Education, Collaboration and Victim Case Management & Support tools (14% and 10% respectively)

- **Consumers**

Limited use of tech tools focusing on Data Trends & Mapping (for example, to learn about the high-risk products of slavery), and Ethical Shopping (more tools on ethical shopping should be developed to inform consumers) (both at 10%)

- **Standards & Certification Bodies**

Limited use of tech tools focusing on Victim / Trafficker Identification

(for example, to gather a list of suppliers who have reportedly engaged in labour exploitation) (9%).

Additional research is needed to identify the reasons for the limited use of the above-mentioned tools by the identified stakeholders. At the same time, this gap analysis can serve as a starting point for organizations funding, developing and implementing technology tools to combat trafficking in human beings when planning their next steps in this field. An immediate priority is to better understand why victim case management and support tools are used in a limited way by NGOs and how this gap can be addressed.

i. Victim-centred approach – Victim journeys

The wider adoption of a victim-centred approach is another important element to take into account when developing strategies to combat human trafficking. In a victim-centred approach, the victim's wishes, safety, and wellbeing precede other matters and procedures, and are the points of departure when organizing and driving programme activities and processes forward.⁹⁷ This approach not only supports victims and survivors to better reintegrate, but also encourages them to “seek assistance and cooperate in the identification and prosecution of traffickers”⁹⁸. Moreover, the Inter-agency Coordination Group against Trafficking in Persons (ICAT) recommends that anti-trafficking preventive and support measures be based on or include the experiences of survivors.

Taking note of these important aspects, the phases of sexual and labour exploitation based on the journey of a potential victim have been mapped and assessed. Within these exploitative phases, the three main areas in which technology tools can be used to help counter the crime have been identified, mainly: prevention, identification and protection.

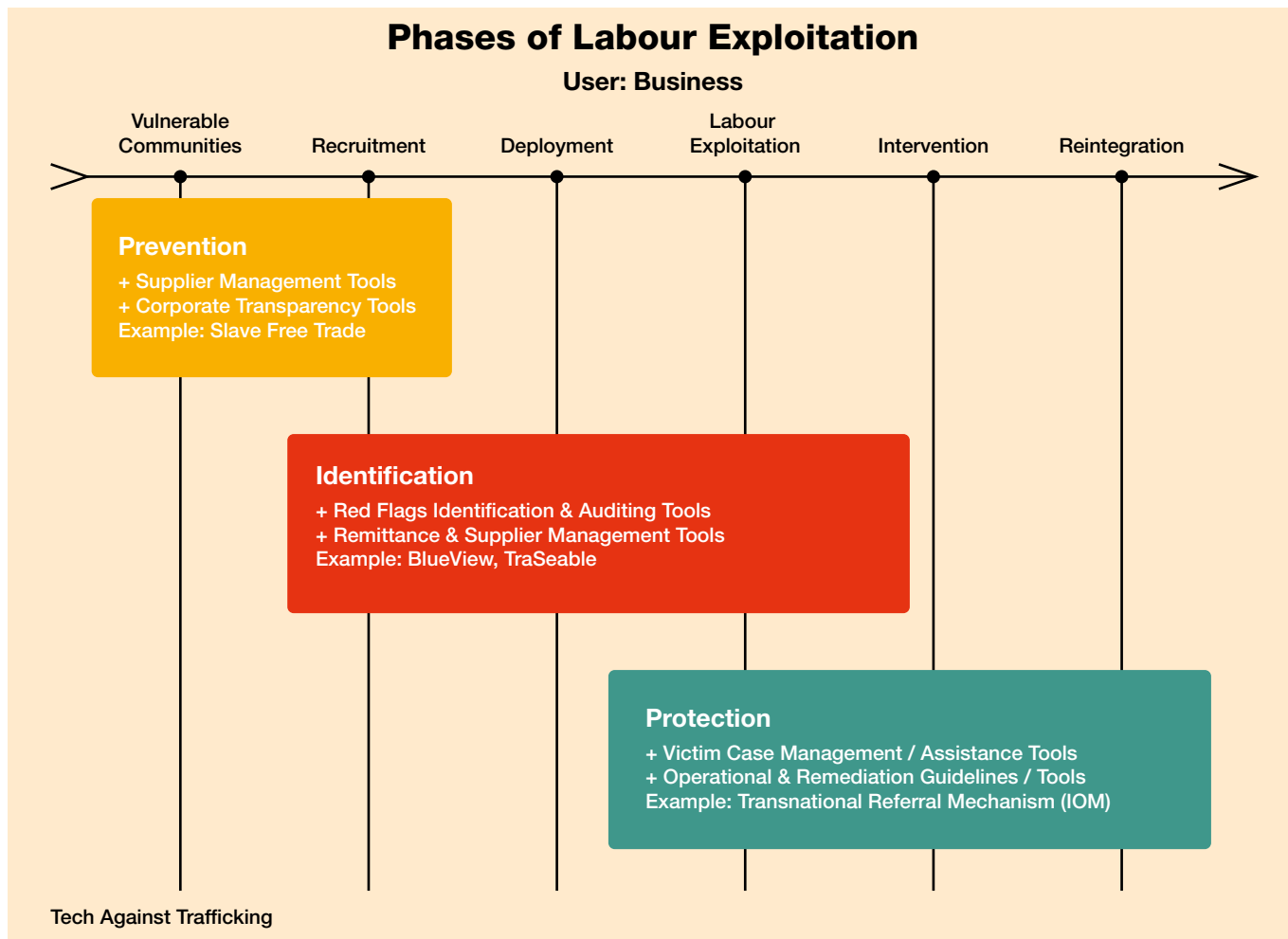
j. Highlights from the landscape analysis

The following section highlights the key takeaways from the landscape analysis of the 305 technology tools identified as of December 2019:

- ***There is a strong concentration of tech tools developed and operating in the Global North despite higher prevalence rates of human trafficking in the Global South for some forms of human trafficking such as forced labour and forced marriages*** (figure 4). Efforts to address the limited availability of anti-trafficking tech tools in developing regions should take into account the regional and national technological infrastructure, as well as local target users' Internet and digital literacy.
- ***Despite increasing numbers of identified victims, the number of Victim Case Management and Support tools remains low.*** The rise in the number of victims detected would seem to imply a greater need for additional tools to support those victims. However, only 6% of identified tools can be classified as victim case management and support tools, representing less of a focus for tool developers than other categories, such as Supply Chain Management and Awareness-raising (figure 5).
- ***The private sector and NGOs are the two main stakeholders behind the development of technology tools to fight human trafficking and governments are considerably lagging behind.*** The analysis of the technology tools identified shows that the private sector has developed 40% of tools and NGOs 33% (figures 12 and 13). Governments were the leading stakeholder in tech development in only 9% of identified tools. The leading role of the private sector can be explained by the great knowledge and resources it possesses. There is no unique explanation for the active role of NGOs. At the same time, the low number of tools and initiatives developed by governments needs additional research as they usually have the resources and the mandate to develop tools but some other factors might prevent them to do so.
- ***Businesses are the top user group of customizable tools*** (accounting for more than a quarter), due to being the user group with the highest purchasing power and technological capabilities. Law enforcement and NGOs follow behind at 17 % each (figure 10).
- ***The private sector accounts for almost half of the user groups who pay to use these technology tools*** (figure 15). It would be worthwhile to look further into which segments of the private sector (whether small and medium enterprises, or multinationals) used and paid for which types of tools and to what extent. This may be a potential research topic for future studies.
- ***Although half of the tools are offered at no cost, the majority (more than three quarters) are proprietary technologies / innovations*** (figure 17). In order to effectively replicate and scale up efforts against trafficking across regions, the respective stakeholders and developers might consider collaborating, sharing and exchanging their technologies and data, especially if they serve the same anti-trafficking goals or purposes (e.g., identifying victims, data trends, etc.).
- Most identified tech tools were developed using ***web/cloud-based, mobile platform, big data and blockchain technologies***.
- ***Business, law enforcement, governments and NGOs are the target users of more sophisticated tech tools*** (such as tools using blockchain and big data technologies), whereas victims and community members are more targeted for low-tech tools (such as mobile apps) (table 2).

⁹⁷ See U.S. DOJ Office for Victims of Crime, “Victim-Centered Approach” [website] (Office of Justice Programs, U.S. DOJ). Available at: www.ovcttac.gov/taskforceguide/eguide/1-understanding-human-trafficking/13-victim-centered-approach/ (accessed 8 May 2020).

⁹⁸ See ICAT, *Pivoting toward the Evidence: Building effective counter-trafficking responses using accumulated knowledge and a shared approach to monitoring, evaluation and learning* (Vienna: ICAT, 2016), p. 20. Available at: www.icat.network/sites/default/files/publications/documents/16-10259_Ebook.pdf (accessed 8 May 2020).

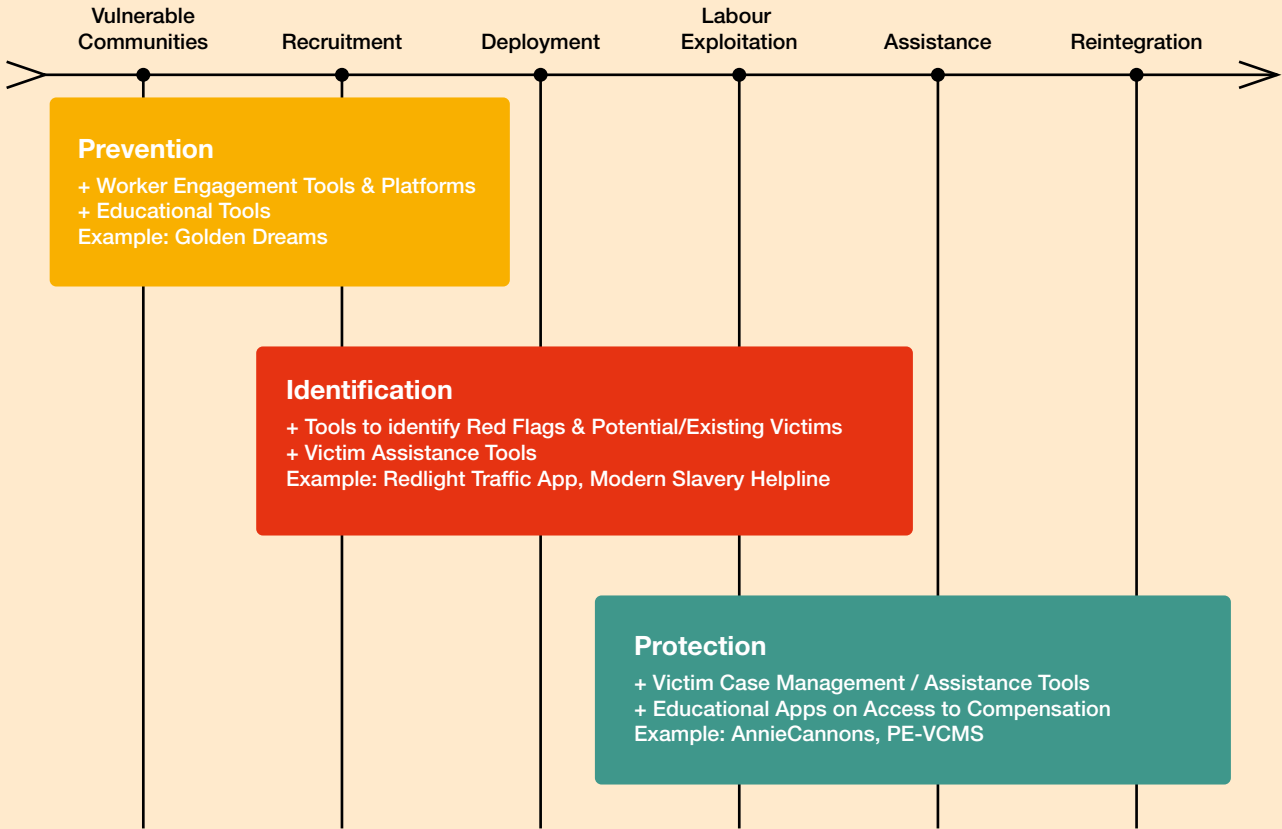


- **More than half of the identified tech tools developed to counter labour trafficking target worldwide users, whereas tools against sex trafficking focus more on the regional level** (figures 20 and 21). The former correspond to the nature of today's globalized supply chains, whereas the latter might be explained by the various regional / national perceptions and legislative approaches to sexual exploitation, as well as to forced marriage and adult services industries.
- **Supply Chain Management and Corporate Risk Identification make up more than one third of anti-labour trafficking tech tools** (table 3). This trend corresponds to the recently tightened legislative requirements for companies headquartered and/or operating in the Global North.
- **It is important to address and understand the various stakeholder groups' needs before developing a technology solution for them.**⁹⁹ Table 5 gives an overview of the stakeholder groups' usage (or targeted usage) of different tool types, based on the 305 identified tools as of July 2019. This is a good starting point for reflecting on whether the stakeholders' actual needs for certain tool types match what they currently use, as well as the availability of the respective tool types (which should be researched in a separate study).
- **Section h shows the current gaps and challenges in terms of the tool types that a certain stakeholder group should use / be targeted at more often.** For example, businesses can be encouraged to engage more with the tech tools aimed at empowering workers in global supply chains.
- Using the **victim-centred approach**, three main areas among the exploitative phases of sexual and labour exploitation have been highlighted, namely: prevention, identification and protection. To most effectively combat human trafficking, technology tools being developed should fall under one or more of these areas. Assessing and grouping the identified tech tools into these areas will also help anti-trafficking stakeholders to quickly identify appropriate tools to support (potential) victims of trafficking, depending on which exploitative phase(s) that they are currently going through.

⁹⁹ See OSCE, "Statement by U.S. Ambassador John Richmond", *19th Alliance against Trafficking in Persons: Opening Session and Keynote Address* [website] (Vienna: OSCE, 18 April 2019), starting from minute 53:28. Available at: www.osce.org/secretariat/417629 (accessed 8 May 2020).

Phases of Labour Exploitation

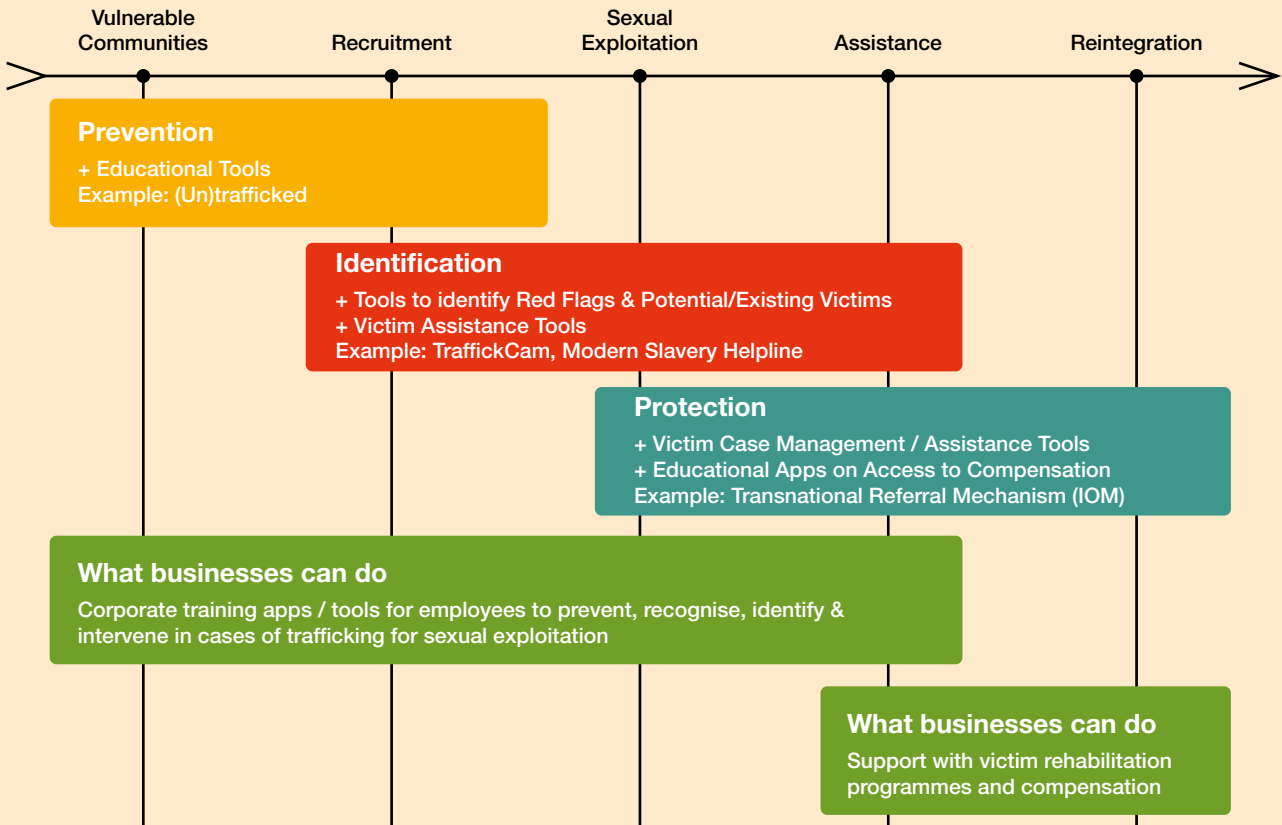
User: Victim of Trafficking



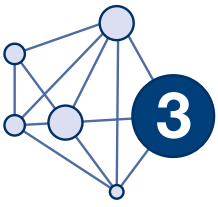
Tech Against Trafficking

Phases of Sexual Exploitation

User: Victim of Trafficking



Tech Against Trafficking



3 Turning the tide: The use of technology to combat THB

The previous chapter discusses individual technology solutions and initiatives already existing in the OSCE area and beyond, which have been developed and implemented to combat trafficking in human beings, giving a general overview of technology tools and describing their geographical coverage, types, user groups and beneficiaries, maintenance and customizability, business model and sector focus.

In this chapter, we are taking a deeper dive into the eleven categories of tools identified and exploring what the tools seek to accomplish within those areas. Additionally, this chapter looks at specific tools as examples of the categories. This angle is highly important to be explored because every technology innovation should have a concrete objective and address a specific problem, otherwise, technology might lack the desired impact.

Practitioners have highlighted that organizations looking for technology-based solutions to combat human trafficking are not always clear about the specific problems they wish technology to solve. There is a risk that technology will be seen as the solution itself rather than as a means to solve a problem. Technology is not a substitute for the range of other factors needed to efficiently combat trafficking, such as political will, adequate resources, or commitment from a wide range of actors with the mandate and competencies in this field. It is thus useful to view initiatives in terms of the specific types of counter-THB work to which they can contribute.

Above, this publication classifies technology-based responses into the eleven areas mentioned on page 25 as the result of the mapping of 305 technology-based initiatives carried out by Tech Against Trafficking in collaboration with the OSCE and the Global Initiative Against Transnational Organized Crime. Bearing in mind that in many cases technology solutions are designed and deployed to generate impact in more than one area in order to maximize the use of resources, the eleven categories of tools mentioned in Chapter 2 can be used to achieve different objectives, which can be categorized and described as follows:

a. Education on identifying and reducing THB risks, seeking help and reporting potential cases

Disseminating information to at-risk communities, including migrants

The global proliferation of ICT and the relative ease with which the global population has been able to access it has proved particularly useful in terms of making information more available to those who need it. One such key group in many parts of the world is that of migrant workers, particularly those in lower-skilled jobs where potential supply can exceed demand, making such workers highly vulnerable to abuse.

Despite major investment over the last two decades in awareness-raising initiatives throughout the world, many migrants still leave home with limited information about the risks of human trafficking and actions they can take to reduce their likelihood of being exploited. An ILO survey in South-East Asia, for example, found that only 17% of migrants across four Asian countries had received information about migration through any type of medium before leaving their home country.¹⁰⁰ Further, most migrants who did have relevant information reported having received this from friends and relatives. As noted by one migrant, “An organization came and told us about migration but we weren’t really thinking about it – then we wanted to migrate but they weren’t there anymore.”

The development of new technologies, in particular, increasing smartphone coverage, offers more opportunities to provide information where and when it is needed to aspiring and actual migrants at all points in the migration process. Taking advantage of this technology, several organizations are using existing migrant knowledge and experience to crowd-source information about safer migration pathways and reliable recruiters and employers. Crowdsourcing, which uses the public at large, or a user group, to share information about a particular problem or topic has proven a powerful tool for workers to organize and raise awareness.

Examples of tech initiatives developed and implemented to share information about the risks of human trafficking with or between workers include¹⁰¹ the

¹⁰⁰ See Benjamin Harkins, Daniel Lindgren and Tarinee Suravoranon, *Risks and rewards: Outcomes of labour migration in South-East Asia* (Bangkok: ILO and IOM, 2017), p. 27.

¹⁰¹ A more detailed description of each of these tools can be found on Tech Against Trafficking’s Interactive Map at <https://techagainstrafficking.org/interactive-map/>

Issara Institute's Golden Dreams app,¹⁰² the website Contratados from the Centro de los Derechos del Migrante,¹⁰³ the International Trade Union's nascent Migrant Recruitment Adviser website,¹⁰⁴ My Labor Matters ("Usaping Trabaho", in Filipino),¹⁰⁵ 1343 Actionline App¹⁰⁶ and the Pantau Pjtki platform.¹⁰⁷

Some of these tools, as for example the Golden Dreams app, are developed in the framework "worker to employer" and have the scope to provide information to global companies regarding working conditions and exploitative practices in their supply chains. Other tools, such as Contratados, Migrant Recruitment Adviser, My Labor Matters, 1343 Actionline, Pantau Pjtki, were designed as "workers to job seekers" platforms, where workers can review their employers and recruitment experience for the benefit of other migrants looking for employment and the general public. This resource can help migrant workers and job seekers avoid exploitative labour trafficking schemes and educate them about their rights. These tools can also provide workers with a means to report grievances and concerns confidentially, increase transparency and accountability among recruiters, and expose practices such as contract substitution, document confiscation, wage theft, fraud, and the charging of illegal fees.

General public awareness

i. Educational and reporting capability for the public

The crime of trafficking in human beings is a complex one because of its many forms and elements. As a result, human trafficking might not be easily understood by non-THB experts in comparison to other crimes such as drug trafficking, murder or rape. Trafficking in human beings is often confused with smuggling of migrants because it involves the trans-border movement of people. Therefore, additional efforts must

be under-taken to educate the general public about what human trafficking is, how it looks in the day-to-day life, and how it can be reported.

Raising awareness about this heinous crime and educating the general public is imperative not only to mitigate the knowledge gap in this field but most importantly to increase the identification of victims and accountability for perpetrators. The more people know about human trafficking the better equipped they will be to identify and report possible cases.

The Internet and technology more broadly offer great opportunities to raise awareness about trafficking and educate different parts of society with targeted interventions. In terms of the wider public, there are a number of tech tools that encourage people to equip themselves with knowledge about trafficking and provide means through which to report possible cases.

Examples of more generic tools which allow reporting of suspicious situations are Stop the Traffik app in the U.S.,¹⁰⁸ Trafficking in Trinidad and Tobago app,¹⁰⁹ Rapoto@ Shpeto (Report-Save Life) in Albania¹¹⁰ or Unseen app in the UK.¹¹¹ Most of these apps provide guidance for recognizing the signs of human trafficking and reporting concerns in confidence. Usually, apps have advanced features such as synchronizing with GPS technology which allows for pin-pointing the location of the reporting party. Some options allow for sending pictures and voice messages.

In addition to applications which allow reporting possible trafficking instances in any situation and place, some organizations have developed apps for more targeted uses. For example, the Safe Carwash app developed in the UK by the Archbishops' Council¹¹² has been created to mobilize communities and help gather information about hand car washes in the UK in order

¹⁰² See Issara Institute, "Tech & Innovation empowered worker voice" [website] (Issara Institute). Available at: www.issarainstitute.org/issara-labs (accessed 8 May 2020).

¹⁰³ See Contratados, "Contratados. Voy Contratado, Voy Informado" [website] (Centro de los Derechos del Migrante, Inc.). Available at www.contratados.org/en (accessed 8 May 2020).

¹⁰⁴ See Recruitment Advisor, "RECRUITMENT ADVISOR. Find the best recruitment agency for your job abroad" [website] (Recruitment Advisor). Available at www.recruitmentadvisor.org/ (accessed 8 May 2020).

¹⁰⁵ See Verité, "My Labor Matters" [website] (Verité Southeast Asia). Available at www.mylabormatters.com/ (accessed 8 May 2020).

¹⁰⁶ See 1343 Actionline Against Human Trafficking, "1343 Actionline App" [website] (Commission on Filipinos Overseas). Available at: www.1343actionline.ph/ (accessed 8 May 2020).

¹⁰⁷ See Tifa Foundation and the Migrant Workers Resource Center, "Pantau PJTKI" [website] (the Tifa Foundation and the Migrant Workers Resource Center). Available at: www.pantaupjtki.buruhmigran.or.id/ (accessed 8 May 2020).

¹⁰⁸ See Google Play, "STOP APP" [website] (Stop the Traffik, 10 April 2019). Available at: www.play.google.com/store/apps/details?id=com.fivestones.fivestones&hl=en (accessed 8 May 2020).

¹⁰⁹ See Google Play, "Trafficking in Trinbago" [website] (Adrian Alexander, 28 July 2016). Available at: www.play.google.com/store/apps/details?id=com.ima5.fantastic.fighthumantraffickingintrinidadandtobago&hl=en (accessed 8 May 2020).

¹¹⁰ See World Vision, "New Hotline Number and Smartphone App Make Reporting Trafficking Possible for more Albanians" [website] (World Vision, 15 June 2014). Available at: www.worldvision.org/about-us/media-center/new-hotline-number-and-smartphone-app-make-reporting-trafficking-possible-more (accessed 8 May 2020).

¹¹¹ See Unseen, "Unseen launches app to report modern slavery" [website] (Unseen, 30 July 2018). Available at: www.unseenuk.org/news/55 (accessed 8 May 2020).

¹¹² See Apple App Store, "Safe Car Wash" [website] (Archbishops' Council, 2018). Available at: www.apps.apple.com/gb/app/safe-car-wash/id1391799915 (accessed 8 May 2020).

to identify those with high risks of human trafficking. Likewise, the Truckers Against Trafficking app¹¹³ in the U.S. was developed to educate, equip, empower and mobilize members of the trucking and travel plaza industry to combat domestic sex trafficking.

Online games are also being used to raise awareness. This is an innovative way to help people, especially children and teenagers, to learn more about this crime in an interactive manner. By playing an interactive game, users are able to get acquainted with different types and stages of trafficking in human beings, from recruitment, exploitation and escape from the trafficking ring, to recovery, social reintegration, and the struggle to exercise the rights belonging to human trafficking victims. The use of video games could be even more impactful in the case of educating a younger audience about human trafficking. Examples of existing initiatives using video games are Missing: Game for a Cause,¹¹⁴ Act!,¹¹⁵ BAN Human Trafficking!¹¹⁶ or the Slavery Footprint.¹¹⁷ These games include role-playing scenarios based on real stories, to raise awareness on different forms of trafficking.

Another positive development in improving the delivery of information to people in order to prevent trafficking situations is the use of artificial intelligence (AI). Tools using AI are able to respond instantly to requests for information, at any time of the day and process a big amount of requests at the same time. A good example is the MissMigration¹¹⁸ tool, which is a Facebook chatbot disseminating valuable migration information. The chatbot provides automatic responses to routine migration inquiries such as passport application requirements, visa and work permit issues, and rules and regulations, information which can be very useful in preventing human trafficking situations.

ii. Consumer information

Technology is also being used to inform the public about how goods are made in the hope that consumers will engage with companies on this issue or adopt

buying behaviour that favours more ethical companies. This is done by providing valuable information on companies' labour standards and production practices that can be consulted by consumers at any moment on a smartphone. Consumers can only choose not to buy from retailers with trafficked or child labour in their supply chains if they are aware of the involvement of a particular brand in such practices.

The U.S. Department of Labor has developed the Sweat & Toil app, which documents child and forced labour worldwide.¹¹⁹ Using this app, consumers can find child labour data and browse goods produced with child or forced labour, thus empowering themselves with the knowledge needed to take better purchasing decisions and contribute to lowering demand for goods made through exploitation.

Apps such as BuyFair¹²⁰ use built-in barcode scanning technology that gives shoppers immediate access to information on a company's steps to eliminate forced and child labour in its supply chain. The SHOP ETHICAL! App provides information on the environmental and social record of companies behind common brands offered in Australian supermarkets and elsewhere¹²¹.

In some cases, technology tools have been developed to provide information to consumers about products and services focus on a particular industry. For example, the Blue Number initiative¹²² acts as a unique identifier for use by anyone involved in the food chain, from farmers, producers, distributors and vendors to consumers. Producers can use their blue number to give the end consumer access to information about their products including contents, nature of the product and region of origin. This makes the supply chain linking producers and consumers visible, creating traceability and transparency, and also helping to mitigate possible human trafficking risks.

The World Wide Fund for Nature (WWF) Bait-to-Plate project is an example of a tool that stores data on a

¹¹³ See Truckers Against Trafficking, "Did you know TAT has an App available for all mobile phones?" [website] (Truckers Against Trafficking). Available at www.truckersagainstafficking.org/app/ (accessed 8 May 2020).

¹¹⁴ See Missing Girls, "Missing. Game for Cause" [website] (Missing Link Trust). Available at: www.missinggirls.itch.io/missing-game-for-a-cause (accessed 8 May 2020).

¹¹⁵ See Lifeboat Project, "Learn to identify the signs" [website] (Lifeboat Project, 2016). Available at: www.lifeboat-act.com/#about (accessed 8 May 2020).

¹¹⁶ See Balkan Act Now! "Ban Human Trafficking" [website] (Balkan Act Now!, 2014). Available at: www.banhumantrafficking.com/en/ (accessed 8 May 2020).

¹¹⁷ See Slavery Footprint, "Slavery Footprint" [website] (Made in a Free World). Available at: www.slaveryfootprint.org/#where_do_you_live (accessed 8 May 2020).

¹¹⁸ See IOM, "Miss Migration" [website] (IOM). Available at: www.facebook.com/MissMigration (accessed 8 May 2020).

¹¹⁹ See U.S. Department of Labor, "Sweat & Toil: Child Labor, Forced Labor, and Human Trafficking Around the World" [website] (U.S. Department of Labor, 2018). Available at: www.dol.gov/general/apps/ilab (accessed 8 May 2020).

¹²⁰ See The Abolish Foundation, "A mobile app to demand transparency from your favorite brands: BuyFair." [website] (The Abolish Foundation). Available at: www.abolishfoundation.com/buyfair/ (accessed 8 May 2020).

¹²¹ See Google Play, "Shop Ethical!" [website] (the Ethical Consumer Group and Outware Mobile). Available at: www.play.google.com/store/apps/details?id=com.outware.shopethical&hl=en (accessed 8 May 2020).

¹²² See Blunumber, "The Blunumber App" [website] (Blunumber). Available at: www.blunumber.com/ (accessed 8 May 2020).

blockchain platform and makes that information available to consumers through a smartphone app.¹²³ This can enable consumers to trace a product all the way back to its source.

Finally, to stimulate the more proactive involvement of consumers — not just boycotting a brand, but starting campaigns on products consumers would like to see freed of exploitation — the platform *slavefreetrade*¹²⁴ has created an app that helps social advocacy along the lines of the well-known *Avaaz*¹²⁵ and *change.org*¹²⁶ platforms.

The main challenges that need to be addressed when developing tools for reporting instances of human trafficking and providing information about conditions under which products are made are co-ordination among different state and non-state actors, and linking these tools with response systems to actually receive and analyse reports about exploitative situations and respond if needed. Without co-ordination and dialogue, different organizations could develop numerous applications which are trying to address the same problem. Over time, many of these applications will become unusable, thus wasting valuable resources. Instead, stakeholders should pool resources and develop and promote unique platforms where human trafficking cases could be reported and information about THB provided. Moreover, before developing a tool to report possible trafficking cases, developers have to ensure that information generated by the tool can be sent to a competent organization, with the data analysed and acted upon.

One common and important feature of the above-mentioned technology tools developed to educate different groups about trafficking in human beings is that many of the tools are the result of multi-stakeholder co-operation. For example, the *Golden Dreams App* was developed by the *Issara Institute* with the support of a government institution, *USAID*, and an entity associated with a private sector company, the *Walmart Foundation*. The *Bait-to-Plate* project is a partnership between the *World Wide Fund for Nature*, the global blockchain venture studio *ConsenSys*, information and communications technology implementer *TraSeable*, and tuna fishing and processing company *Sea Quest Fiji Ltd*. Another good example is the *BAN Human Trafficking App* in the Balkan region, which was funded by the *European Union* and implemented by a number of national and regional NGOs and the *Netherlands Helsinki Committee*.

The multi-stakeholder approach existing in the development of technology tools underlines first the interest of the anti-trafficking community in the use of technology but also in the leveraging of different expertise and knowledge. The multi-stakeholder approach shouldn't stop with the development phase but it is most essential in the implementation phase to ensure that these initiatives aren't only information/reporting gadgets but instead lead to real solutions to the trafficking problem.

b. Removing opportunities for exploitation: Using technology to prevent, disrupt and circumvent traffickers

As mentioned in the first chapter of this publication, human traffickers are also using online video games to groom children and exploit them in different ways, especially sexually. To address this problem, technology solutions have been developed to prevent grooming attempts online, especially of children and minors. A good example is “*Project Artemis*” from *Microsoft* which is a tool focused on detecting grooming techniques, code named by which online predators attempting to lure children for sexual purposes can be detected, addressed and reported.¹²⁷ The technique is applied to historical text-based chat conversations. It evaluates and “rates” conversation characteristics and assigns an overall probability rating. This rating can then be used as a determiner, set by individual companies implementing the technique, as to when a flagged conversation should be sent to human moderators for review. *Microsoft* announced that this tool would be shared with other organizations.

In the field of trafficking for forced labour, the use of technology to increase the sharing of information on recruiters and brokers can help migrants self-select into safer migration channels (as well as assist employers in choosing recruiters), thus eliminating exploitative actors. Technology also offers the opportunity for more direct recruitment processes that circumvent local brokers. In many countries, migrants and formal recruitment agencies rely heavily on local brokers, who are often in positions of power as gatekeepers of information and links. Payments to these brokers can place migrants in situations of high-interest debt, essentially binding them to their workplace. This makes them extremely vulnerable to abuse and exploitation. This has led organizations such as the *Issara Institute* to emphasize that the risks to migrants are highest in the “first mile”. Online recruitment offers the opportunity

¹²³ See Worldwild Fund for Nature New Zealand, “New Blockchain Project has potential to revolutionise seafood industry” [website] (WWF-New Zealand). Available at: www.wwf.org.nz/what_we_do/marine/blockchain_tuna_project/ (accessed 8 May 2020).

¹²⁴ See *Slavefreetrade.org*, “slavefreetrade” [website] (slavefreetrade.org). Available at: www.slavefreetrade.org (accessed 8 May 2020).

¹²⁵ See *Avaaz.org*, “AVAAZ. The world in action” [website] (avaaz.org). Available at: www.avaaz.org/page/en/ (accessed 8 May 2020).

¹²⁶ See *Change*, “Start a petition” [website] (change.org). Available at: www.change.org (accessed 8 May 2020).

¹²⁷ See *Courtney Gregoire*, “Microsoft shares new technique to address online grooming of children for sexual purposes” [website] (*Microsoft*, 9 January 2020). Available at: www.blogs.microsoft.com/on-the-issues/2020/01/09/artemis-online-grooming-detection/ (accessed 8 May 2020).

to bypass local brokers, either by allowing migrants to apply directly for a position or, where knowledge or technology coverage is more limited, through a process facilitated by a trusted local civil society or government organization.

An online process also creates a digital record from the moment of application. With the help of blockchain technology, this offers a potential means for addressing problems with worker contracting, in particular, contract substitution. Many migrant workers are deceived by labour recruiters who promise wages and working conditions that are false. In such cases, workers sign a contract with favourable conditions with recruiters in their country of origin, but when they arrive in the country of destination the recruiters then substitute a different, much less favourable contract. One ILO study estimated that contract substitution affects 43% of migrants from Myanmar to Thailand, to the extent that having a written contract was actually less reliable than having a verbal agreement.¹²⁸ By entering each worker's contract into a blockchain, this creates an immutable record of the original contract given to the worker. This can be used to verify that: (1) the contract is compliant with applicable legal standards and in a language understood by the migrant; and (2) it is the same contract provided to the worker at the workplace.

One promising example in this regards is the partnership between the Mekong Club, a Hong Kong-based NGO partnering with business to make improvements in their supply chains, and Diginex, a company that uses blockchain for commercial purposes and is testing the utility of the technology to address certain exploitative practices in the labour recruitment industry. Using a multi-stakeholders approach, Diginex and the Mekong Club, along with their corporate partners, are testing whether blockchain technology, with its capability of keeping immutable records, can be used to reduce contract substitution, including by allowing workers who have varying levels of technological ability to upload their documentation personally.¹²⁹

Another multi-stakeholder pilot project testing an application of blockchain technology is the Coca Cola Company's co-operation with the non-profit organization Blockchain Trust Accelerator.¹³⁰ The multi-stakeholder partnership, which also includes the U.S. Department of State, is using the secure ledger provided by this technology to validate worker contracts. Through

Box 1: Artificial Intelligence

Technology is useful in sourcing and sorting through large amounts of information, finding patterns and deriving meaning. One such application is Artificial Intelligence (AI). AI is the simulation of human intelligence processes by machines, especially computer systems. These processes include learning (the acquisition of information and rules for using the information), reasoning (using rules to reach approximate or definite conclusions) and self-correction. Examples of technology tools based on Artificial Intelligence include Project Intercept from the NGO Seattle Against Slavery, Spotlight from NGO Thorn, and the childsafe.ai platform.

incontrovertible evidence and security in contracts, Coca Cola aims to audit and review how labour agents are interacting with workers.

At the employer end, a small Thailand-based NGO called FairAgora is piloting Verifik8, a labour monitoring system for smaller-scale businesses in the fish-farming sector in Thailand.¹³¹ Building on an environmental monitoring programme, the system requires employers to upload for each new worker, their (1) contract, (2) photo, (3) visa/work permit, if applicable, and (4) contact details. The contract can thus be checked for compliance with local law, while the contact details enable FairAgora to contact workers by phone or through text messages. At any time, auditors can visit farms and check the correlation between what has been uploaded and what is on-site. The system also calculates labour needs based on the production cycle, and prompts employers in periods when they are likely to be taking on more workers. It may be potentially possible to connect this type of initiative with recruitment, or to build-in time recording components, which would reduce the chances for underpayment or non-payment of wages.

There remain challenges in the use of blockchain technology, most notably that the system is only as reliable as the data inputted. In the Diginex example, the risks involved in having contracts uploaded by labour recruiters are being addressed by having the uploaded contract verified by the worker, along with the uploading of their photo.

¹²⁸ See Benjamin Harkins, Daniel Lindgren and Tarinee Suravoranon, *Risks and rewards: Outcomes of labour migration in South-East Asia* (Bangkok: ILO and IOM, 2017), p. 32.

¹²⁹ See Diginex and Mekong Club, "Combating Modern Slavery" [website] (Diginex and Mekong Club, 2019). Available at: www.eminproject.com/ (accessed 8 May 2020).

¹³⁰ See Blockchain Trust Accelerator, "Blockchain Trust Accelerator" [website] (The Bitfury Group and the National Democratic Institute). Available at: www.trustaccelerator.org (accessed 8 May 2020).

¹³¹ See Fairagora, "VERIFIK8, A Monitoring & Verification Solution for the Seafood Supply Chain" [website] (fairagora, 2017). Available at: www.fairagora.com/verifik8 (accessed 8 May 2020).

Other challenges to relying on blockchain technology to fully automate recruitment processes include migrant access to, ability to use, and trust in technology. Rapidly increasing smartphone coverage and literacy has been cited by the Issara Institute as a key component in efforts to reduce exploitative labour practice in Myanmar, but smartphone literacy remains low among other migrant populations.

In addition, some governmental laws require a paper contract to be signed, witnessed and notarized and do not recognize “e-contracts”. Moreover, there may be difficulties integrating blockchain solutions into other online systems that governments use for visas or fulfilling job requests (e.g. e-Migrate in India¹³² or Musaned in Saudi Arabia¹³³). Thus, while blockchain technology carries the potential for fully automating and digitizing the complex layers and paperwork required in the migration process, there still are challenges of accessibility and some policy hurdles to overcome.

c. Victim identification: New reporting avenues for victims of trafficking and other parties

Technology is assisting in the identification of trafficked persons in a number of ways. These include: (1) increasing avenues for victims of trafficking to be identified either through self-reporting or third-party reporting; (2) overcoming language barriers; (3) the use of artificial intelligence (see Box 1); and (4) the use of digital investigation techniques.

Tech solutions in this space do not have to be complex - WhatsApp, Facebook Messenger or a dedicated SMS/text/phone channel allow multiple avenues to communicate with a victim seeking assistance. Messaging apps can provide a straightforward way for victims to communicate in real time with service providers or personal support networks.¹³⁴ For example, Polaris runs the U.S. National Human Trafficking Hotline, which allows the general public to anonymously report suspected instances of human trafficking via the Internet, text messages or toll-free phone calls. Tips are reviewed by Polaris, whereupon the information is sent to relevant law enforcement agencies.¹³⁵

A key barrier to communication remains language, with many victims unable to communicate directly with a person who could potentially assist them, such as police officers, labour inspectors, NGO workers or social auditors. Several organizations have developed apps to address this problem. One example is the Mekong Club’s Apprise app,¹³⁶ developed in collaboration with the United Nations University Institute on Computing and Society, for high-risk environments such as fishing boats. Service providers can download the app onto their phones. When someone must be interviewed, a questionnaire appropriate for the situation can be chosen. The phone is then handed to the interviewee, who selects their language using their national flag as a symbol. After an introduction, the interviewee, listening on headphones, is played a series of questions to which they answer yes or no. At the end of the interview, the app tabulates the answers in the interviewer’s language to provide an assessment of vulnerability, including whether the interviewee wishes to be removed immediately from the situation. As well as helping to overcome language barriers, the app addresses the constraints of literacy, privacy, time and cost.

Artificial intelligence, especially facial recognition software, is being increasingly used in attempts to locate victims of trafficking. As far back as 2009, the Microsoft Corporation partnered with Dartmouth College to develop a technology tool, called PhotoDNA, now used extensively to counter THB and child sexual exploitation content online. PhotoDNA¹³⁷ allows users to upload photographs of missing children and matches those photos with images from child sexual abuse images and other online ads for sexual services. If a match is found, it is reported to organizations like the National Center for Missing and Exploited Children. The program is available free to certain law enforcement and non-profit entities. Another similar tool used in the U.S. by a different organization to locate potential victims online with facial recognition is idTraffickers,¹³⁸ which analyses missing persons’ reports and online ads with biometric technology and generates intelligence reports that can be used by law enforcement.

¹³² See Ministry of External Affairs of India, “eMigrate” [website] (Overseas Employment Division of the Ministry of External Affairs, Government of India). Available at: www.emigrate.gov.in/ext/ (accessed 8 May 2020).

¹³³ See Ministry of Human Resources and Social Development of the Kingdom of Saudi Arabia, “Musaned the domestic labour program” [website] (the Ministry of Human Resources and Social Development of the Kingdom of Saudi Arabia, 30 November 2016). Available at: www.youtube.com/watch?v=w24qzpnCQx18 (accessed 8 May 2020).

¹³⁴ Survivors use simple Facebook pages or WhatsApp channels to connect with their communities to support each other’s recovery. Support pages provide a sense of community and solidarity, and service providers active on social media post resources such as support group or mental health information.

¹³⁵ See Polaris, “U.S. National Human Trafficking Hotline” [website] (Polaris). Available at: www.polarisproject.org/responding-to-human-trafficking/ (accessed 8 May 2020).

¹³⁶ See United Nations University Institute in Macau and The Mekong Club, “Apprise” [website] (the United Nations University Institute in Macau and The Mekong Club). Available at: www.apprise.solutions/home (accessed 8 May 2020).

¹³⁷ See Microsoft, “Help stop the spread of child exploitation” [website] (Microsoft). Available at www.microsoft.com/en-us/photodna (accessed 8 May 2020).

¹³⁸ See idTraffickers, “Software for law enforcement that identifies enslaved persons and traffickers” [website] (Bashpole Software, Inc.). Available at: www.idtraffickers.com/ (accessed 8 May 2020).

Taking this a step further, the California-based non-profit Thorn has partnered with technology firms to pilot age-progressed facial recognition software called Spotlight that can be used to examine child abuse material and identify missing children. If a child is abducted at a young age and has been missing for an extended period of time, this tool creates a digital image of what the child may look like at an older age. Such images can then be matched across both the open web and the dark web with advertisements or social media posts to facilitate identification and location. While Thorn has engineers on staff, they routinely also partner with engineers at large tech firms who donate their expertise and time.

The same tool Spotlight from Thorn is used to scan the web to recognize red flags of children being trafficked for sex and advertised online. This technology, using heightened processing power that can scan a quantity of data too great for manual processing, provides a physical trail of evidence and connections. This can be used by law enforcement to identify and locate victims and traffickers. Such data can also be used in court to support prosecution. With the help of Spotlight, law enforcement is currently identifying on average over 8 children a day. Moreover, those who use Spotlight daily see a 63% reduction in time spent on processing.¹³⁹

NORC at the University of Chicago is an independent social research organization that turns data into actionable intelligence. NORC has developed the Sex Trafficking Operations Portal (STOP)¹⁴⁰ that uses automated data mining to create reports for law enforcement about possible human trafficking activity online.

In late 2015, Facebook also joined the effort to combat online trafficking. In conjunction with the New York Attorney General's office, Facebook created algorithms that analyse language, phone numbers and images used on its platform in order to identify victims of online sex trafficking, with a particular focus on child victims.¹⁴¹ While the exact details of this process were not made public, it is widely believed that it uses Facebook's expansive facial recognition systems to identify missing persons from photos placed on the social media platform.

Seattle Against Slavery, a grassroots coalition working to mobilize communities in the fight against sex and labour trafficking, has developed in co-operation with Microsoft, the Project Intercept,¹⁴² a victim outreach

and buyer deterrence software. By using chatbots with language informed by survivors of trafficking and prostitution, the software helps local survivor advocates connect with and help potential victims.

Another example of engaging the public in crowdsourcing is the TraffickCam app. This tool asks users to take pictures of hotel rooms they stay in, while law enforcement agencies upload photographs from advertisements for sexual services. These pictures are analysed for similarities by a computer algorithm in a national database. The aim is that the public's access to a massive number of hotel rooms will facilitate law enforcement's efforts to identify locations where sex trafficking may have occurred.

Many technology tools described in this section are supporting law enforcement's day-to-day investigations of human trafficking cases, even if these tools were not developed and are not managed by them. PhotoDNA from Microsoft, for example, has been widely adopted by law enforcement, to aid in finding and removing known images of child sexual exploitation online. Spotlight from the U.S. NGO Thorn is used by police officers in all 50 U.S. states and Canada, and this web-based tool has helped in identifying 14,874 child victims of human trafficking and 16,927 traffickers in the past four years. The purpose of TraffickCam is to create a database of hotel room images that an investigator can efficiently search, in order to find other images that were taken in the same location as an image that is part of an investigation. These examples highlight the great value for government institutions of establishing partnerships with the private sector and NGOs in the successful use of technology to fight human trafficking and that the relevant partnerships can make a difference in this field.

d. Collecting publicly available information to combat human trafficking

While social media and other online forums are being misused by human traffickers to recruit and exploit their victims, open source intelligence (OSINT) and social media-based investigations have also been useful tools in the fight against human trafficking.

Open source intelligence is information collected from publicly available sources to be used in an intelligence context. The size and scope of open source data has increased immeasurably as technology has progressed and publicly available information has flooded

¹³⁹ See Thorn, "Spotlight helps find kids faster" [website] (Thorn). Available at: www.thorn.org/spotlight/ (accessed 8 May 2020).

¹⁴⁰ See University of Chicago, "Sex Trafficking Operations Portal (STOP)" [website] (NORC at the University of Chicago). Available at: www.norc.org/Research/Projects/Pages/sex-trafficking-operations-portal-stop.aspx (accessed 8 May 2020).

¹⁴¹ See Jeff John Roberts, "How Facebook Will Fight Sex Trafficking" [website] (Fortune, 8 October 2015). Available at: www.fortune.com/2015/10/08/facebook-sex-trafficking/ (accessed 8 May 2020).

¹⁴² See Seattle Against Slavery, "Freedom Signal. Technology to Combat Online Sex Trafficking" [website] (Seattle Against Slavery). Available at: www.seattleagainstsavery.org/technology/ (accessed 8 May 2020).

the Internet. This publicly available data can provide a wealth of information to assist in the identification and investigation of both human traffickers and their victims, and has been used with good success around the world.

A good example of open source data being used to hinder traffickers is the World Check database. Thomson Reuters, in alliance with NGO Liberty Asia, has successfully used open source information to identify and flag more than five thousand convicted human traffickers since 2015. By monitoring online world media, they confirm the identities of offenders convicted of human trafficking, which are then loaded into the World Check database, compiled by Thomson Reuters. Although World Check is not a tool designed specifically for human trafficking cases-it is a general identity verification platform-the database enables information about individuals and organizations convicted of human trafficking to be safely and accurately passed on to the international business community, allowing them to make informed decisions about whom they do business with and making it more difficult for traffickers to disguise, launder and move their illicit proceeds across the globe.¹⁴³ This is a good example how a multi-use technology tool could be leveraged to fight human trafficking.

Traffickers using fake social media profiles to list false or misleading job advertisements is a common method to attract victims. Conveniently, most social media communication apps, chatrooms and similar mediums can afford the same anonymity to human trafficking investigators as they do to perpetrators. This enables investigators to safely and remotely communicate with victims and offenders under the guise of being a prospective customer or potential victim to gather evidence of trafficking. Large amounts of useful data about offenders can be gleaned from social media accounts, including their lifestyle, associates and assets - details which can be used to support successful investigations and prosecutions.

Undercover investigations in which investigators assume false online identities to identify and engage with offenders or victims are commonly used by law enforcement organizations around the world. There are various benefits in carrying out such investigations using social media and other online platforms such as classified advertisements websites. Undercover investi-

gators can gather the same amount of information, with fewer resources and without being placed in potentially hazardous situations than when meeting offenders face-to-face. Using social media and other online platforms for online investigations has become a common and popular method for human trafficking investigators in some OSCE participating States. Examples of technology tools in this regard are Project Intercept implemented by the U.S.-based NGOs Seattle Against Slavery and childsafe.ai¹⁴⁴ which can be used to assume false online identities in order to engaged in direct contact with traffickers, victims of buyers.

Most mainstream social media organizations and other online platforms will co-operate with law enforcement and turn over requested data regarding potential offenders upon the production of relevant legal orders to do so. However, it is widely recognized that for law enforcement agencies outside the United States, obtaining such information can be a cumbersome, expensive and drawn-out process.

e. Risk assessment: Identifying areas of risk for greater vigilance, for example in private sector supply chains

Another area benefiting from the capability of technology to sort through large quantities of information is that of risk assessment. A multi-national company may have thousands of suppliers around the globe, with codes of conduct, including labour standards, expected from each of their suppliers. Such companies use on-the-ground audits to verify that a supplier is complying with its standards. Increasingly, these firms are aware of their responsibility to avoid human trafficking in their operations, in part due to recent disclosure laws passed in the United Kingdom, France, the United States of America and Australia.

At the company level, the Target Corporation is working in partnership with Goodweave International,¹⁴⁵ an organization dedicated to ending child labour with a focus on the carpet industry in South Asia. The Target Corporation is piloting a database that compiles and aggregates data from inspections and audits of entities in the company's supply chain in India, and also includes anonymous surveys and feedback from workers.¹⁴⁶ Aggregated data is then displayed on a dashboard that enables Target's supply chain managers to make decisions in relation to human rights considerations. Users

¹⁴³ See Thomson Reuters, "Thomson Reuters World-Check and Liberty Asia exceed 5,000 names in anti-human trafficking initiative" [website] (Thomson Reuters, 18 June 2017). Available at: www.thomsonreuters.com/en/press-releases/2017/june/thomson-reuters-world-check-and-liberty-asia-clear-5000-names-in-anti-human-trafficking-initiative.html (accessed 8 May 2020).

¹⁴⁴ See childsafe.ai, "The Artificial Intelligence Platform Protecting Kids Online" [website] (childsafe.ai, Inc). Available at: www.childsafe.ai (accessed 8 May 2020).

¹⁴⁵ See Target, "Crafting a Better Tomorrow: Target Joins Forces with GoodWeave" [website] (Target, 2 September 2015). Available at: www.corporate.target.com/article/2015/09/good-weave-partnership (accessed 8 May 2020).

¹⁴⁶ See USAID, "Supply Unchained Initiative" [website] (USAID). Available at: www.partnerships.usaid.gov/partnership/supply-unchained-initiative (accessed 8 May 2020).

can analyse demographic trends and create directed interventions.

The Mekong Club is also collating audit data to assist companies in identifying areas of risk. Its Risk Assessment Matrix (RAM) involves more than 15,000 lines of audit data from 25 countries, compiled in a framework that allows comparison of different questions from different audit standards and question sets. Data is classified according to key indicators of forced labour based on ILO criteria as well as additional metrics (e.g. relating to migrant labour recruitment), country and region. It is further categorized according to product (footwear, apparel, accessories, etc.) and process (manufacturing process relating to Tier 1, processing and components relating to Tier 2, or raw materials relating to Tier 3). Users can access information on: (1) the types of labour violations observed during audits; and (2) information on the total number of audits undertaken and the number issues found. This is being complemented by country level data and information from the Apprise Audit. The analysis of this vast amount of information to identify human trafficking cases would not be possible without the use of technology.

It is worth highlighting that audits can be forged or be susceptible to other influences. Such erroneous data can contaminate the analysis, painting an incomplete or inaccurate picture of whether a supplier is acting ethically and workers' rights are being upheld. Technology can help address this concern by (1) improving worker input into auditing and monitoring processes (see following section), and (2) by complementing audit data by accessing and processing other information sources. These can be news reports, court filings, public records, or any materials that compromise the open source data footprint of a supplier and its business associates.¹⁴⁷ A low-tech version of this is an adverse word search, whereby companies can scan the Internet for key words associated with forced labour and trafficking.

This information can also serve as a preventative measure. The U.S. software company SAP Ariba partners with Made in a Free World, an organization that uses artificial intelligence, analytics software, and cloud technology to analyse supply chains. By aggregating open source and other data, this software enables a supply chain manager to access publically available data about suppliers, gauging them for the risks they pose to labour rights.

f. Monitoring and compliance: Proactive monitoring of situations where people may be at risk of exploitation

Recognizing the limitations of existing mechanisms, such as audits, for identifying human trafficking and forced labour violations in company supply chains has led to a quest for new detection methods, both in the workplace and during worker recruitment processes. In particular, companies and worker welfare groups have increased efforts to communicate with workers in the form of worker feedback and worker voice initiatives. There are a range of products on the market that use mobile and other technologies to survey workers or determine the prevalence of trafficking in human beings. These products can augment in-person, traditional data collection methods, and have the benefit of connecting to people through technologies they are already comfortable with. In addition, low costs and the ability to conduct rapid assessments of workers' exploitation enables interventions to reach target groups quickly, and respond to issues as they emerge in real time.

One example is the tool GeoPoll,¹⁴⁸ which administers surveys via SMS, interactive voice responses (IVR), and a mobile app to reach farmers, miners, factory workers, fishing communities, and others who have witnessed or experienced labour violations. Surveys can be deployed once or periodically over time to monitor conditions and evaluate interventions. The company has a network of 225 million users in over 40 countries in Africa, Asia and the Middle East, and can target by location (region, city, county, village) and demographics (gender, age). GeoPoll's platform sends surveys through SMS or IVR that are of no cost to the respondent. Information is anonymously collected. Surveys typically have 15 to 25 questions, with some asking about prevalence of human trafficking, child and forced labour.

Labourlink¹⁴⁹ is another tool for gathering worker feedback in order to identify human trafficking cases. It is a mobile platform that establishes a two-way communication channel for workers to share their viewpoints in real time, and for organizations to have clear visibility of worker well-being in their supply chains. Since 2010, Laborlink technology has been deployed in more than 20 countries and has reached over 3,000,000 workers worldwide. Topics of the survey include forced labour and ethical treatment, health and safety, grievance mechanisms, sexual harassment and women's health.

¹⁴⁷ See Samir Goswami, "Testimony to the Tom Lantos Human Rights Commission in the U.S. Congress", Hearings on Artificial Intelligence: The Consequences for Human Rights, (July 2018). Available at: www.humanrightscorrection.house.gov/events/hearings/artificial-intelligence-consequences-human-rights (accessed 8 May 2020).

¹⁴⁸ See GeoPoll, "GeoPoll Solutions" [website] (GeoPoll). Available at www.geopoll.com/geopoll-solutions/ (accessed 8 May 2020).

¹⁴⁹ See Elevate, "Worker Engagement" [website] (Elevate Limited). Available at: www.elevatelimited.com/services/consulting/worker-engagement/ (accessed 8 May 2020).

Ulula, another technology tool, combines a grievance platform with surveys on working conditions using automated surveys, free SMS, voice calling, and Facebook's social media messenger app for engaging stakeholders and measuring environmental, social, and governance (ESG) risks. It is able to categorize and display information according to key ESG indicators in real time, enabling a prompt response.¹⁵⁰ Other examples of worker feedback programs include the ICTI Ethical Toys Program Worker Voice Pilot¹⁵¹ and Adidas' Fair Play Hotline, an internal grievance mechanism for all employees worldwide.

An increasing role in the identification of victims of human trafficking and perpetrators is being played by the analysis of financial transactions and the financial sector. In most of the OSCE participating States, banks and other financial institutions are mandated to monitor for suspicious transactions and report these transactions to financial investigation units. Banks and financial institutions are usually asked to report suspicious transactions related to money laundering or terrorist activities. Nevertheless, there are good examples where authorities, banks and financial institutions take a step forward and focus narrowly on identifying possible human trafficking cases.

The active involvement of banks and other financial institutions in combating trafficking is essential because of their ability to identify the financial flows of illicit funds moved by the organized groups and the possibility to identify human trafficking cases without the need for victims to report their exploitative situation. The connection between the financial sector, technology and human trafficking can be explained by the fact that the analysis of financial transactions with the purpose to identify trafficking cases is carried out by specialized software developed by banks based on algorithms mainstreaming human trafficking indicators. More advanced software with high-capacity processing adapted to human trafficking indicators is better positioned to identify human trafficking cases.

Project PROTECT¹⁵² in Canada is a recent example of how the use of THB indicators to analyse financial transactions can lead to the identification of human trafficking victims and perpetrators. This project is a public-private partnership between the Financial Transactions and Reports Analysis Centre of Canada (Fin-

TRAC), financial institutions and law enforcement that is using money trails to detect and investigate traffickers. Banks' anti-money laundering arms are starting to red flag suspicious accounts, based on indicators such as multiple motel bookings, large expenditures at drug stores and frequent ATM deposits in the middle of the night. They report suspicious activity to FinTRAC, which in turn notifies law enforcement.

Another similar example is the United States Banks Alliance Against Human Trafficking (USBA) which includes American Express, Bank of America, PayPal, Deutsche Bank as well as the U.S. Department of Homeland Security, the New York County District Attorney and the NGO Polaris. The Alliance-crafted tools are used by participating banks in their internal systems to scan for indicators and patterns in large financial data sets that could indicate trafficking activity. Civil society participants with subject matter expertise advise financial industry staff on what to look for. Examples include: (1) transfer of funds back to the employer or the same third party after payment of wages (possible debt repayment); (2) relatively high expenditures for items inconsistent with a stated purpose such as the rental of multiple apartments (housing of workers); (3) business customers making regular transactions outside of normal business hours (such as charges at 2 a.m. at a nail salon which may indicate possible prostitution). Participating banks also collect data that may be used as evidence in cases against traffickers. As New York County District Attorney Cyrus Vance Jr. stated to the Thomson Reuters Foundation, *"This kind of gathering of hard data, it shows dollar movement and who owns the credit cards, these kinds of things are the circumstantial and direct evidence, hard evidence that helps build these cases."*¹⁵³

In addition, the Thomson Reuters Foundation has worked with the European Bankers Alliance, which includes Barclays, HSBC, Standard Chartered and UBS to develop a toolkit that educates bank staff to spot signs of trafficking by people making deposits at physical locations, as well as case studies and tools that enable analysts to identify, detect and report "suspicious patterns in financial activity".¹⁵⁴ Similar work with banks is being undertaken in Asia, where Thomson Reuters Foundation and the Mekong Club are supporting the Asia Pacific Bank's Alliance against Trafficking, which recently released a White

¹⁵⁰ See Ulula, "Stakeholder Engagement for Responsible Supply Chains" [website] (Ulula LLC). Available at: www.ulula.com/product/ (accessed 8 May 2020).

¹⁵¹ See ICTI Ethical Toy Program, "Worker Helpline" [website] (International Council of Toy Industry). Available at: www.ethicaltoyprogram.org/en/our-program/worker-engagement/worker-helpline/ (accessed 8 May 2020).

¹⁵² See Financial Transactions and Reports Analysis Centre of Canada (FINTRAC), "Project PROTECT. Public Service Renewal in Action" [website] (FINTRAC, 16 August 2019). Available at: www.fintrac-canafe.gc.ca/emplo/psr-eng (accessed 8 May 2020).

¹⁵³ See Ellen Wulforst, "Banks get tools to spot human traffickers moving illicit profits" [website] (Reuters, 19 July 2018). Available at: www.reuters.com/article/usa-trafficking-banking/rpt-banks-get-tools-to-spot-human-traffickers-moving-illicit-profits-idUSL8N1UF4LU (accessed 8 May 2020).

¹⁵⁴ See Thomson Reuters Foundation, Thomson Reuters Foundation launches toolkit to tackle human trafficking with financial data (Thomson Reuters Foundation, 2 May 2017). Available at: www.trust.org/contentAsset/raw-data/4a50dde4-0a6c-49f9-9ba4-92a8b10d3243/document (accessed 8 May 2020).

Paper¹⁵⁵ advancing further on the work that has been done in the EU and the United States.

This section has highlighted once again that the multi-stakeholder approach is being frequently used in the development and implementation of technology tools to combat human trafficking. Whether technology is used for worker engagement or identification of possible trafficking cases, most of the tools are the result of partnerships between different organizations. In addition, some of the tools mentioned in this section can support law enforcement in the identification of victims and perpetrators and investigation of cases. Project PROTECT in Canada, for example, which is focused on the banking sector, has considerably increased the number of possible THB cases reported to law enforcement based on analysis of financial transactions.

g. Identifying and acting on typologies – Big data searches and pattern analysis

Technology plays an important role in the collection, aggregation and analysis of data which led to the identification of trends and patterns of human trafficking. This is highly important in the development of strategic responses to the crime of human trafficking, and ensure efficient allocation of human and financial resources.

The Internet is limitless and human trafficking cases could be facilitated by thousands of online platforms. In the absence of data aggregation and analysis tools, manually browsing and analysing platforms by law enforcement, NGOs or policymakers is not a viable option, especially given that platform analysis needs to be updated and reviewed with frequency.

A good example of the use of technology to analyse global and regional patterns is the Counter-Trafficking Data Collaborative (CTDC) which is the first global data hub on human trafficking, publishing harmonized data from counter-trafficking organizations around the world. Data on human trafficking are often highly sensitive, raising a range of privacy and civil liberty concerns where the risk of identifying data subjects can be high and the consequences severe. CTDC leverages modern technology to overcome these obstacles and allows unprecedented public access to the world's largest datasets on human trafficking. Bringing together global data in one platform strengthens and empowers local, national and international institutions to eradicate crimes of trafficking and exploitation.¹⁵⁶

Tellfinder (formerly Memex) is another sophisticated technology tool which has different functionalities including aggregating data to identify key people and organizations involved in human trafficking and discovering trends and outliers with the help of artificial intelligence to automatically flag high-risk or high-value indicators based on language or image content.¹⁵⁷

It is well known that data collection has been a perennial challenge in the counter-THB domain. The hidden nature of the crime and its variety of typologies pose challenges to consistent data collection methods and methodology. "In-person" data collection methods can be expensive, take time and require additional steps to process and analyse the information. For example, it takes time for a team of researchers to establish the necessary relationships in the field, build trust with those being surveyed, and engage in face-to-face data collection through surveys. Thus, technology is now increasingly being used to augment in-person data collection, especially in efforts to determine the prevalence of trafficking in human beings.

For example, IST Research¹⁵⁸ is a U.S.-based organization that uses multiple techniques to estimate the prevalence of human trafficking. It was recently designated as the research partner of the Global Fund to End Modern Slavery, with initial research being conducted in South and Southeast Asia. Currently, IST is running research studies to estimate the number of individuals in exploitive labour conditions by combining an array of data collection channels, including field-based collection, call centres, social media communications, IVR and others. These various tools enable IST to reach the target population through the channels they are already using. Furthermore, IST is able to track the same individuals and survey them over various points in time for deeper longitudinal analysis.

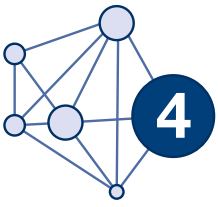
IST estimates that a traditional prevalence study can take up to eighteen months to complete, at a high cost. Utilizing social media, mobile phone-based surveys and other channels enables prevalence studies to be conducted at a significant reduction in cost and time. The technology-enabled methodologies also allow for rapid scaling of methods to collect both qualitative and quantitative data. These techniques can also be used for monitoring and evaluation to measure the impact of on-the-ground interventions, creating a direct line to beneficiaries to capture their experiences in real time, as well as informing further interventions.

¹⁵⁵ See Thomson Reuters Foundation, "Thomson Reuters Foundation and The Mekong Club launch resource for financial institutions in Asia Pacific to combat modern slavery" [website] (Thomson Reuters Foundation, 2019).

¹⁵⁶ See Counter Trafficking Data Collaborative, "The Counter Trafficking Data Collaborative. Global Data Hub on Human Trafficking" [website] (IOM, Polaris and Liberty Shared, 2018). Available at: www.ctdatacollaborative.org/about-us (accessed 8 May 2020).

¹⁵⁷ See Uncharted, "tellfinder. Expose Hidden Connections" [website] (Uncharted Software Inc, 2018). Available at: www.uncharted.software/product/tellfinder/ (accessed 8 May 2020).

¹⁵⁸ See IST Research Corporation, "IST Research" [website] (IST Research Corporation, 2018). Available at: www.istresearch.com (accessed 8 May 2020).



4 Ethical Considerations and Data Protections

Stakeholders planning to leverage technology to enhance their efforts to combat trafficking in human beings should take into account some important aspects related to data privacy, ethics and informed consent. Most technology applications for countering trafficking in human beings require some form of collecting, storing, sharing and analysing of data — each of which have their own inherent risks and required protection. For example, an NGO might receive funding to develop an application aimed at supporting and providing service to victims and survivors, but not have the training on security needed to adequately safeguard the data it collects. A law enforcement organization might benefit from a technical solution developed by an NGO or a private sector company to better investigate human trafficking cases, but not have in place the necessary protocols and rules on the release and distribution of data obtained through the use of the technology solution. Likewise, a software company may want to develop and make its technology available to anti-trafficking stakeholders, but its team may not have the cultural understanding of the population it aims to assist.

Managing risks related to data privacy, ethics and informed consent is highly important in human trafficking cases because of the subjects of the data - the victims of exploitation. Victims' trauma could increase if their data and story are accessed by third parties which would lead to an opposite effect than the one intended when developing technology to fight human trafficking.

Mitigating risks related to data privacy and ethical use of information in human trafficking cases requires, first of all, close co-operation and constant communication between technology companies, law enforcement, NGOs and survivors providing support and protection to human trafficking victims and survivors. This co-operation ensures that NGOs, on one hand, provide the necessary guidance on what type of information can be collected from victims and how to collect information without creating additional trauma to victims, and that technology companies, on the other hand, develop the necessary technical environment which would keep the collected information safe and secure and prevent unauthorized access by third parties.

There is no comprehensive list of measures to be taken regarding data protection, ethics and informed consent when developing technical solutions to help combat trafficking in human beings. At the same time, technology companies and NGOs involved in this process should address the following aspects, at minimum:

1. The establishment of consent protocols with survivors and victims of trafficking who share their data with researchers. Victims and survivors have to be aware that their data is being collected and this awareness needs to be explicit. The purpose of collecting data should be communicated as well as how data will be stored, shared and used. The protocol should include information on how victims and survivors can request that their data is deleted. The consent protocols should not be a “tick the box exercise”, but victims and survivors have to be informed in simple language of all the relevant information regarding their data. The consent protocols are also needed as a tool for accountability;
2. The principles an engineer uses ensure that the design and outputs of technology solutions take into account the preferences and needs of future users and beneficiaries of the solution. It is common in a business-to-business environment for technology companies to follow the guidance provided by their clients when designing a product. The same working principles should be followed in the anti-trafficking space and it is advisable that technology companies consult with NGOs or law enforcement authorities who will be using their technical solutions in combating human trafficking. It is true that sometimes tech companies get engaged in anti-trafficking work as part of their corporate social responsibility commitments, nevertheless, even in this case they should consult with the stakeholders who will benefit from this work or they risk developing a product which might not be used;
3. Protection measures to ensure that any data, especially information that allows for personal identification, is stored securely and that only authorized persons have access to it. Victims' case management systems, databases used by law enforcement to manage human trafficking criminal cases, data aggregation and analysis software contain data about victims, including their name, date and place of birth, home address, photos etc. In cases of cybersex trafficking or human trafficking of minors for the production of sexual abuse content, some systems might also store this information as evidence. Often times, the databases include information about witnesses in the case. It is extremely important that current and future technology tools have all the necessary security features to protect this information from unauthorized access because public release of this information will not only damage the investigation of cases but can also increase

the trauma and endanger the safety of the victim and his/her family;

4. Preventing the use of technology tools for obtaining data from victims and vulnerable people for extractive purposes only, as for example, to give companies information on suppliers, rather than to address the complaints and grievances of individuals vulnerable to human trafficking. As described in previous chapters of this publication, a considerable share of technology tools developed in the anti-trafficking space are focusing on identifying the risk of human trafficking for labour exploitation in supply chains and also on engaging and empowering workers. These tools allow companies to collect information from suppliers and workers on possible human trafficking situations and exploitative practice in the operations of corporations. There is an incentive for companies to use information about human trafficking situations obtained with the help of technology primarily to manage reputational risks or avoid doing business with a certain supplier. Nevertheless, it is crucial that companies behave ethically and use information not for extractive purposes only, but to help victims escape the exploitative situation and prevent such practices in the future.

Likewise, it is crucial that tools designed to combat trafficking in human beings are not misused to commit other crimes or violate human rights. The balance between mainstreaming technology in the anti-human trafficking work and the need to address the risks associated with its use rests on incorporating ethics into design and application — and keeping these considerations at the forefront. For example, an application may scour worker social media posts to glean insight into a labour recruiter or a factory, with the purpose of identifying employers violating human rights. However, the same technology and the analysis and insight it brings might be used by illicit recruiters or corrupt government agents to identify and target workers making complaints. Predictive analytics can be used to uncover human trafficking hotspots, but can also be used to arrest union organizers. Thus, human rights compliance should be considered during the development and dissemination of technology tools.

Some organizations have conducted research on considerations around data privacy, ethics and informed consent. In its report on ethics and data,¹⁵⁹ the Issara Institute states: “As more organizations working in anti-trafficking and responsible sourcing are handling digital information and data from the populations they serve, there is an urgent need for ethical standards

Box 2: Ethical guidelines for technology use

The Issara Institute outlines seven guidelines when applying technology in the anti-trafficking space:

1. Do No Harm: Be compassionate but neutral
2. Prioritize personal safety and security: Identify and minimize risks
3. Get informed consent, with no coercion
4. Ensure anonymity and confidentiality to the greatest extent possible
5. Adequately select and prepare interpreters and field teams
6. Prepare referral information and be prepared for emergency intervention
7. Do not hesitate to help others: Put your information to good use

and approaches. Digital technologies, such as mobile phones, social media, and data analytics software, provide many opportunities to address trafficking and responsible sourcing. These tools also introduce a new set of harms, risks, and threats to vulnerable people.”

Another initiative which strongly advocates for the ethical use of data and information is the Worker Engagement Supported by Technology (WEST Principles). This initiative “aims to maximize the impact of technology-driven efforts to identify and address the risk of abuse and exploitation of workers in global supply chains.”¹⁶⁰ The WEST Principles recommends that organizations planning to leverage technology to combat human trafficking assess cyber and digital security risks throughout the chain of data-custody, develop appropriate mitigation plans that include inputs from workers or their representatives and develop robust data management protocols to prevent the misuse of data. Moreover, the WEST Principles advocate for the use of data to identify opportunities for improved working conditions across industries through the use of quantitative data to support behaviour changes and scale ongoing engagement to drive systemic change.

As exciting as it could be to enhance the response to human trafficking by developing and using cutting-edge technology tools, all those involved in this process have to ensure that considerations around human rights, data privacy, ethics and informed consent are being addressed in the most comprehensive way, otherwise the risks of technology having a negative impact rather than a positive one in combating human trafficking can increase.

¹⁵⁹ See Rende Taylor, Lisa Maria and Mark Latonero, *Updated Guide to Ethics and Human Rights in Anti-Trafficking: Ethical Standards for Working with Migrant Workers and Trafficked Persons in the Digital Age* (Bangkok: Issara Institute, 2018), p. 46.

¹⁶⁰ See WEST Principles, “WEST PRINCIPLES. Worker Engagement Supported by Technology” [website] (WEST Principles, 2017). Available at: www.westprinciples.org (accessed 8 May 2020).



5 Conclusions

A number of conclusions have emerged from the research and analysis contained in the previous chapters. The conclusions discussed in this chapter do not represent an exhaustive list, but rather an attempt to highlight the most important takeaways which could assist anti-trafficking stakeholders in prioritizing their work in this field. At the same time, it is important to acknowledge that due to the constant developments in the technology sector and the anti-trafficking field, the below conclusions will have to be updated in the future.

a. Technology for good and bad

As the preceding chapters outline, various applications of technology could be beneficial to countering trafficking in human beings. Many innovations are being applied today through multi-stakeholder partnerships of technology professionals, civil society organizations, multi-national businesses and government entities. Furthermore, as technology continues to evolve, future applications also hold promise for counter-THB applications. On the other hand, traffickers and others who profit from exploitation use technology to further their illicit activities, for example, to recruit or exert further control over victims, to promote deceptive recruitment practices, and to launder and hide profits. Indeed, a common theme throughout the paper is the potential for technology to be both misused to facilitate the work of traffickers and also to assist in their detection, apprehension and prosecution.

b. The importance of multi-sectoral collaboration

Innovation in technology often occurs when adequate research and development funds are invested and these are then recouped when the developed solution can be commercialized. Countering THB however is not a commercial activity, per se, and thus resources are often limited for the full engineering life cycle of development, testing and deployment. Many of the technology innovations discussed in this publication are applications that exist for other sectors and are being applied to countering THB with the support of private and corporate foundations or governments. Scalability is thus a challenge when there is no clear commercial roadmap in place. These considerations highlight the benefits of collaboration.

One promising example of a multi-sectoral collaboration is Tech Against Trafficking that was established in early 2018 to “work with civil society, law enforcement,

academia, and survivors to identify and create technology solutions that disrupt and reduce human trafficking ... and that support survivors through innovation, collaboration, guidance and shared resources.”¹⁶¹ The group’s initial focus has been to map the landscape of tech interventions and the development of tech solutions for countering human trafficking, and to share knowledge between technology experts and their anti-human trafficking counterparts. Alliances like TAT offer the potential to unlock the expertise and resources that exist in the private sector for applications in the “social good”.

On a practical level, this publication has highlighted a common factor in promising interventions, namely, the involvement of multiple stakeholders in their design, development and implementation. For example, in the case of victims’ identification, each stakeholder has a role to play: NGOs provide law enforcement agencies with valuable information about trafficking derived from their frequent contact with victims and the research they conduct; technology companies offer expertise and engineering resources; and government agencies provide data, resources, political and policy support, and avenues for application.

This publication has also provided in its different chapters concrete examples of technology tools developed successfully through multi-sectoral collaboration.

Drawing from multiple sources of expertise can also create useful checks to ensure that tools, technology, and protocols do not cause inadvertent harm to victims. Though such collaborations can be resource intensive, the relationships they forge are particularly important for victims and survivors. Victims may feel apprehensive about co-operating with law enforcement for the development of technology tools to combat THB, but knowing that a supportive NGO is also engaged can help build trust with victims.

Similarly, with the development and fielding of surveys, there is no substitute for partnering with those on the ground who can help inform design and use the data to implement programmes. Without such engagement, problems may arise, such as using inappropriate technology or covering less important issues.

c. The role of government

Governments have multiple roles to play in the promotion of technology-based solutions to trafficking, from

¹⁶¹ See Tech Against Trafficking, “Companies Collaborating With Global Experts to Help Eradicate Human Trafficking Using Technology” [website] (Tech Against Trafficking). Available at: www.techagainstrafficking.org/ (accessed 8 May 2020).

encouraging business engagement and functional collaborations, to the funding or co-funding of initiatives. For example, a key stimulus to business investment in such solutions was legislation in California and the United Kingdom requiring large companies to report their efforts to identify and address exploitative labour practices in their supply chains. Governments can take such steps further by (1) increasing the requirements for companies to exercise diligence in their supply chains, and (2) setting an example through their own procurement practices.

Government agencies routinely partner and contract with private sector technology companies for law enforcement and defence and security applications. Although these partnerships have at times raised questions about civil rights, data protections and privacy, this publication has highlighted instructive examples of co-operation between law enforcement entities and the tech industry for countering THB, with some co-operation also involving NGOs.

At the same time, the analysis of technology tools made in the second chapter of this publication has revealed that governments are not the most pro-active in developing innovative technology tools to combat human trafficking. Only 9% of the 305 tools analysed by this publication have been developed by government institutions. Therefore, there is a need for additional research to identify the factors which prevent governments from playing a more active role in this space.

The publication also highlighted that governments, with minimal investments, can benefit from the support of the private sector and NGOs in the innovative use of technology to combat trafficking in human beings. NGOs and technology companies are partnering with law enforcement to utilise cutting-edge technology developed by them in the investigation of trafficking cases. These types of partnerships are beneficial for all parties involved and can considerably scale up the response to human trafficking.

d. Moving beyond pilot projects

The market for technologies to counter-THB is somewhat limited. Government investment in tools that provide law enforcement agencies the means to investigate labour or sexual exploitation is also limited, especially when compared to the volume of exploitation that is being facilitated by the Internet.

One implication of this is the need for the private sector and governments to identify and prioritize those tech applications that have proven their effectiveness. There has been a proliferation of applications at varying degrees of implementation that do very similar things.

Emphasis now needs to be placed on moving beyond the cycle of developing and piloting new initiatives, and toward expanding the coverage of those existing initiatives that are showing results.

e. No substitute for on-the-ground knowledge or presence

Although the technology being used to combat THB is often the major focus, this is frequently not the most difficult challenge in combating human trafficking. Technology-based solutions must be rooted in an understanding of on-the-ground realities, from the technology that is being used by the majority of target users in their daily lives and the types of issues that may be important to them, to the likelihood that they will provide accurate data, without which responses may do more harm than good. Real contextual expertise is crucial to effective responses: knowing what questions to ask, how and when to ask them, and through what mechanisms.

It is particularly important to understand the barriers to victims of trafficking coming forward or providing accurate responses. In addition to access to technology, there are multiple barriers, most well documented. They include: (1) fear of reprisals against the victim or their family; (2) lack of trust in those attempting to help; (3) debt obligations or perceived obligations; (4) stigmatization; (5) lack of a potential for remedy or the perceived lack of alternatives; and (6) victim-support services that range from being merely ineffective, to being contrary to the wishes of the victim, such as detention in anti-THB shelters or mandatory return to their country of origin.

For this reason, communication is essential between information technology agencies and those working on the ground, these often being local community service organizations or informal migrant groups. The Issara Institute, for example, highlights the value of coupling low-tech on-the-ground solutions (such as community migration ambassadors) with high-tech approaches providing on-demand information and platforms designed for workers.

f. Understanding the displacement effect

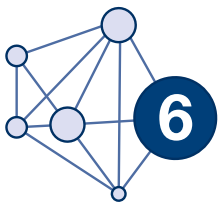
Like all forms of organized crime, trafficking is subject to a displacement or push-down pop-up effect. Exploitative agents respond to attempts to curtail their activities by changing their location and/or modus operandi. In other words, as soon as law enforcement finds ways to combat trafficking, traffickers look for a new way to evade them. For example, soon after Craigslist closed their “personals” section, new ads began popping up in other sections such as the travel section, offering sex services to tourists who were visiting particular places. Also, after the U.S. Department of Justice in 2018

seized the website Backpage.com due to its facilitation of prostitution and sex trafficking,¹⁶² hobby boards and sugar daddy websites are in a position to potentially see a short-term spike in advertising transactions¹⁶³ demonstrating that traffickers adapt to new circumstances. A similar development in the future might be the obvious reaction to victims using smartphones to report abuses: traffickers ensuring that victims do not have access to phones.

In developing solutions, it is extremely important that those involved also anticipate likely counter-responses and build these considerations into their project design. This once again highlights the importance of partnerships between service providers, law enforcement, survivors and tech companies. Combating human trafficking with technology tools is not a one-time effort, but rather a constant process of updating, adjusting and innovating. For this reason, experts must be involved in every step to effectively respond to changes in technology, trafficking methods, legislation and law enforcement protocols.

¹⁶² See U.S. DOJ, "Justice Department Leads Effort to Seize Backpage.Com, the Internet's Leading Forum for Prostitution Ads, and Obtains 93-Count Federal Indictment" [website] (U.S. DOJ, 9 April 2018). Available at: www.justice.gov/opa/pr/justice-department-leads-effort-seize-backpagecom-internet-s-leading-forum-prostitution-ads (accessed 8 May 2020).

¹⁶³ See Rob Spectre, *Beyond Backpage, Buying And Selling Sex In The United States One Year Later* (New York: childsafe.ai, 2019), p. 43.



6 Recommendations

In order to maximize the value of technology-based solutions while ensuring that ethical considerations are fully addressed, this section provides recommendations divided into two groups — a set of general recommendations for all actors involved in the use of technology to combat trafficking, and a more specific set of recommendations for governments, reflecting the OSCE's role as an inter-governmental organization. The recommendations are not in order of priority.

Importantly, there are limits to what technology can do. Practitioners should temper their expectations of how much technology can “solve” problems. The use of technology in certain applications also raises a series of ethical questions, related to both privacy and security concerns, as well as how data generated from vulnerable populations is used. Further, victims and other vulnerable persons cannot realistically have a voice if the way questions are framed ignores issues of high importance to them. It is thus imperative that developers take time to understand the potential implications of their innovations.

General recommendations

1. Those who are funding, developing and implementing technology-based solutions should be clear about the purpose of these solutions and why such solutions are preferable to alternatives.

Tech-based initiatives should not be solutions looking for problems. As highlighted in this publication, there are many possible uses of technology in counter-THB efforts, including the following: (1) increasing access to information for trafficked persons, vulnerable groups, members of the public and consumers, both individuals and companies; (2) using the power of mass processing and artificial intelligence to help identify and investigate individual THB cases and apprehend perpetrators, as well as highlight wider THB patterns, typologies and areas of risk; (3) harnessing the immutability of blockchain records to create a monitoring and auditing trail; (4) facilitating contacts between different groups to help identify victims and help them exit from trafficking; and (5) providing people with the tools and support they need to avoid exploitative pathways. It is important to be clear about the specific problem that each technology-based initiative is planning to solve.

2. Those who are funding, developing and implementing technology-based solutions should ensure that these solutions are fit for the intended purpose, taking into account issues regarding access, coverage and literacy.

Having up-to-date technology and protocols means very little if the people in need are unable to access or use that technology. For example, victims in remote areas may not have access to the Internet, may not own mobile phones or have limited understanding of how to use them, may lack trust in, or, conversely, have too much trust in certain information sources, or may simply be unable to afford maintaining a mobile phone subscription.

Effective technology must be user friendly. Developers and tech companies may understand their resources on a deep, complex level, but it is not realistic to expect victims, service providers, law enforcement, or the public to become experts in technology every time they want to use a tool. Tools developed for victims or potential victims have to use simple terms and language to be as intuitive as possible in their use. They also have to have simple design and few menu options in order to avoid confusing users with complicated features and commands. For this reason, new technology must balance cutting edge advancements with a user-friendly format. When developing new tools, tech companies should consider the amount of training resources that must go into successful implementation.

3. Those who are funding, developing and implementing technology-based solutions should address issues of privacy, safety, trust and retaliation risks.

Target audiences must feel confident that information they provide will not just be used, but be used safely and wisely to improve their situation, and that there is no possibility of adverse or unintended consequences, such as unauthorized access to information by third parties or unauthorized sharing of sensitive or confidential data.

The risk of retaliation for victims of trafficking and others raising issues on their behalf is real. The relevant stakeholders must make sure to assess and mitigate this risk, including through use of technology tools based on anonymized responses, analysis and management of data by third parties, agreements on non-retaliation from employers, recruiters, etc.

4. Those who are funding, developing and implementing technology-based solutions should only collect actionable data.

Knowing how the data will be used to advance the cause of the target group is critical to maintaining trust and confidence as well as ensuring the effective use of limited resources. There is little value in collecting data that cannot be used or acted upon. This is not only disrespectful, but may lead to disengagement and can even be dangerous. For example, there have been instances of resources being spent on developing and publicizing hotlines that are then unable to assist those who call.

5. Those who are funding, developing and implementing technology-based solutions should align their work with other ongoing initiatives.

With resources limited, efforts should be made to collaborate in sharing existing technology and data. For example, worker surveys can be used to complement audit data or to unearth sensitive or hard to detect information that may be missed by an audit. Likewise, initiatives for identifying child victims of human trafficking for sexual abuse online through facial recognition technology should use information and databases of already existing technology initiatives in this field and not duplicate them.

6. Those who are funding, developing and implementing technology-based solutions should consider whether a suitable application is already available before developing a new one.

Building on the previous point 5, the authors of this publication identified more than 300 technology-based initiatives and these are only the ones that are currently public. Resources should not be spent duplicating work where existing remedies already exist. Instead, firms should seek to share relevant data and technologies, and aim innovative work at solving problems that lack existing efficient tools. Available resources are best focused on the effective use of initiatives and tools already in place.

7. Those who are funding, developing and implementing technology-based solutions should keep up to date with changes in both technology and the human trafficking context.

Technology-based solutions must stay up to date with new developments, particularly: (1) changes in applicable legal frameworks; (2) emerging new forms of exploitation; and (3) potential counter-responses by perpetrators to actions that affect their operations and revenue.

8. Those who are funding, developing and implementing technology-based solutions should ensure the active engagement and participation of the target group in the development process.

Efforts by various stakeholders, however well meaning, may unintentionally make the lives of trafficked persons and vulnerable people worse rather than better. Many migrant workers, for example, are hugely dependent on overtime in order to save money and be able to return home as soon as they can. Developing tech tools for assisting the enforcement of low overtime caps without consulting workers can extend their stay in a foreign country considerably, which is not necessarily in the best interest of workers. Another example is the use of technology tools to promote more formalized recruitment processes aimed at increasing worker protection. Many such processes involve significant delays and costs, often placing workers in sizeable debt and actually increasing rather than decreasing their vulnerability to exploitation and abuse. It is essential to be aware that survivors, victims or potential victims' perceptions of their own welfare may be different from those trying to help them.

Another reason why victims and survivors of trafficking in human beings should be directly engaged in the development of technology tools to combat THB is because they have the knowledge about the *modus operandi* of criminals and have witnessed how traffickers are misusing technology for their own advantage. This information is extremely important for the success of the anti-trafficking response and victims'/survivors' voices should serve as the primary resource when developing technology tools. Victims are the ultimate beneficiaries of all interventions in this field and they should play an important role in the development of tools designed to end human trafficking.

9 Those who are funding, developing and implementing technology-based solutions should test assumptions and measure outcomes.

While there are no universally agreed estimates of the size of the human trafficking problem, it is generally accepted that efforts to date have resulted in: (1) the identification of only a small proportion of victims of trafficking; and (2) the investigation and successful prosecution of an even smaller number of traffickers. Further, there is little evidence that traditional trafficking prevention programmes based on awareness raising and alternative livelihoods have been effective in reducing the number of people being drawn into trafficking.¹⁶⁴ Against this background, attention must extend beyond whether a technology has been developed or deployed to an assessment of the resulting impact or effects.

¹⁶⁴ See ICAT, *Issue Paper No. 4: Pivoting toward the Evidence: Using accumulated knowledge and a shared approach to monitoring, evaluation and learning to build effective counter-trafficking responses* (Vienna: ICAT, December 2016). Available at: www.icat.network/sites/default/files/publications/documents/16-10259_Ebook.pdf (accessed 8 May 2020).

That is, did the “good” that was envisioned in a “tech for good” application actually happen? Technology may help in finding and understanding a problem better, or to gather accurate data, but the problem must still be acted upon.¹⁶⁵

It is important to underline that the process of assessing outcomes begins during the design stage. Evaluations of counter-THB work frequently highlight that the original design relied on a series of assumptions that were not supported by available evidence, and thus it was likely from the beginning that the intended outcomes would never be met.¹⁶⁶

Recommendations for governments

The technology tools presented and analysed in this publication indicate how technology can vastly improve our ability to counter THB. This section presents recommendations on how governments in particular may expand their key role in promoting and guiding the use of technology.

Recommendations relating to the regulatory role of governments

1. Governments are encouraged to consider applying policies and legislation that would curb the misuse of technology and would incentivize the positive use of tech tools to combat human trafficking.

As mentioned previously in this publication, technology has enabled criminals to increase the size of the human trafficking market. They can use online platforms, including legitimate ones, to recruit, control, advertise and exploit more victims. This trend has been observed in both human trafficking for sexual exploitation and forced labour cases. At the same time, the case-based approach in fighting human trafficking has shown its limitations as the number of identified victims is extremely low compared to the global estimates of human trafficking. Therefore, policies are needed to mandate or incentivize technology companies to undertake efforts to ensure that their platforms and resources are not being used to facilitate human trafficking. Some policy initiatives have been enacted in the OSCE area, such as the Stop Enabling Sex Traf-

fickers Act and Allow States and Victims to Fight Online Sex Trafficking Act in the US,¹⁶⁷ but this effort needs to be replicated across the entire OSCE region.

Moreover, policies and political pressure are needed to compel companies to actively monitor their supply chains for human rights abuses, with increased legal accountability for those who do not. OSCE participating States and others can use technology to verify how workers in public and private supply chains are being treated. Governments can act upon such technology-gleaned insights by requiring companies to drive supply chain improvements, enable law enforcement to hold accountable those who abuse human rights, and encourage other governments to take similar steps.¹⁶⁸

2. Governments are encouraged to consider supporting the effectiveness of technology-based solutions with accompanying evidence-informed policy.

Notable examples are: (1) mandating and supporting faster official labour recruitment processes to make workers less susceptible to recruitment-induced, coercive debt obligations; (2) promoting ethical online recruitment to reduce reliance on exploitative sub-brokers in rural areas; and (3) enhanced laws and policies for regulating online temporary recruitment agencies, including cross-border.

3. Governments are encouraged to develop international and/or national minimum standards for confidentiality in relation to the technology enabled provision of assistance and support to victims.

There are considerable risks related to the mismanagement, unauthorized use and sharing of personal data stored on online resources of victims and all the individuals involved in a trafficking case. Since this type of data can be collected and managed by different, state and non-state entities, governments have to develop international and/or national minimum standards for confidentiality related to the technology enabled provision of assistance and support to victims to ensure that there is a harmonized framework that would be used similarly by all stakeholders involved.

¹⁶⁵ See Samir Goswami, “Testimony to the Tom Lantos Human Rights Commission in the U.S. Congress”, *Hearings on Artificial Intelligence: The Consequences for Human Rights* (July 2018). Available at: www.humanrightscommission.house.gov/events/hearings/artificial-intelligence-consequences-human-rights (accessed 8 May 2020).

¹⁶⁶ See ICAT, *Issue Paper: Pivoting toward the Evidence: Using accumulated knowledge and a shared approach to monitoring, evaluation and learning to build effective counter-trafficking responses* (Vienna: ICAT, December 2016). Available at: www.icat.network/sites/default/files/publications/documents/16-10259_Ebook.pdf (accessed 8 May 2020).

¹⁶⁷ See U.S. Congress, “H.R.1865 — Allow States and Victims to Fight Online Sex Trafficking Act of 2017” (115th Congress (2017–2018)). Available at: www.congress.gov/bill/115th-congress/house-bill/1865/text (accessed 8 May 2020).

¹⁶⁸ See Samir Goswami, “Testimony to the Tom Lantos Human Rights Commission in the U.S. Congress”, *Hearings on Artificial Intelligence: The Consequences for Human Rights* (July 2018). Available at: www.humanrightscommission.house.gov/events/hearings/artificial-intelligence-consequences-human-rights (accessed 8 May 2020).

Recommendations relating to the role of government as law enforcer

4. Governments are encouraged to consider increased resourcing of technology-based solutions for government entities entrusted with identifying trafficking cases.

This includes supporting: (1) labour inspectors to use technology applications to verify conduct and ensure national labour laws are being upheld; and (2) law enforcement to vastly increase their abilities to counter online sexual exploitation and recruitment of victims through online fraudulent employment offers.

5. Governments are encouraged to consider increasing resources and training for national and local law enforcement and service providers to support more effective use of technology-based solutions.

Law enforcement must have the ability to keep pace with the misuse of technology by traffickers and also with the opportunities that new technologies present for combating THB. Service providers must use technology tools to be able to provide the fastest, most secure and reliable services to human trafficking victims. Therefore, governments should allocate sufficient resources for law enforcement and service providers to be able to benefit from specialized technology tools which could scale up the fight against human trafficking, including the necessary software, hardware, and training.

Training has to be provided not only on the direct use of tools but their ethical use with the respect of human rights and data protection.

6. Governments are encouraged to consider increasing resources and training for policymakers, law enforcement, service providers, NGOs and academia to understand the myriad ways in which technology is being misused by traffickers.

The *modus operandi* of technology-facilitated trafficking in human beings has its specific characteristics. Technology allows traffickers to hide their true identities, increase their anonymity online and exploit victims in new ways. These new developments have important consequences on the response to human trafficking and can increase the difficulties to identify traffickers and bring them to justice.

As a result, all those involved in combating trafficking in human beings — policymakers, law enforcement, service providers, NGOs and academia — should be

trained to better understand how technology is being misused by traffickers. Efficient responses to technology facilitated human trafficking cannot be developed unless the relevant stakeholders have a good understanding on how traffickers use technology for their own advantage. The private sector should also benefit from capacity building in this field because, as it was confirmed by the findings of this publication, technology companies play an active role in the development of tech tools.

Recommendations relating to the role of governments as investor

7. Governments are encouraged to consider expanding their support for partnerships with tech companies and businesses to invest in research and development, and to incentivize scaling.

Government institutions rely on the knowledge and expertise of the tech sector in many areas. There are numerous examples when technology firms are supporting government projects and operations for many years in areas such as defence and military, immigration and asylum, space programs, education or agriculture. At the same time, there are few examples and mostly from North America, where the support of the technology private sector has been mainstreamed within anti-trafficking work to become one of the fundamental pillars in the fight against this phenomenon. Therefore, governments across the OSCE area should establish strategic partnerships with the technology sector in order to develop new innovative solutions to combat human trafficking and scale the response. As the Inter-agency Coordination Group Against Trafficking in Persons (ICAT) highlights in its issue brief on human trafficking and technology¹⁶⁹ “*future success in eradicating human trafficking, in its many forms, will depend on how countries and societies are prepared for, and equipped to, harness technology in their responses*”. Success in this field cannot be achieved without the expertise, knowledge and capacity for innovation of the technology private sector.

8. Governments are encouraged to consider increasing investment in multi-lateral institutions and other coalitions that bring together multiple stakeholders from various disciplines to collectively counter-THB with the assistance of technology.

Trafficking in human beings facilitated by technology is global in nature and in some cases perpetrators could be located in one country, the victim in another one and the ICT infrastructure which enables the recruitment, control, advertising and exploitation of the victims in a

¹⁶⁹ See ICAT, *Human trafficking and technology: trends, challenges and opportunities. ICAT Issue Brief 07* (Vienna: ICAT, 2019), p. 1.

different country. Therefore, a multi-lateral response is needed and coalitions built to efficiently address trafficking at a global stage. Governments are encouraged to be proactive in this regard as it is first and foremost the responsibility of States to combat human trafficking.

Examples of multi-lateral institutions and coalitions established to tackle technology-enabled human trafficking already exist. Tech Against Trafficking, which co-authored this report, is a coalition of technology companies collaborating with global experts to help eradicate human trafficking using technology. There are also a number of platforms focusing specifically on trafficking of children for sexual exploitation online. WeProtect is a global alliance led by the UK government and supported by a large number of countries, technology companies and civil society organisations and which has the goal to end child sexual exploitation online.¹⁷⁰ Other similar international platforms include the INTERPOL Specialists Group on Crimes Against Children and the Virtual Global Taskforce to Combat Child Online Exploitation.

9. Governments are encouraged to consider placing greater emphasis on measuring the results of projects supported by technology.

Many existing reports on projects using technology-based solutions focus on the technology itself rather than the outcome of the intervention it supported. This encourages a focus on technology as an end in itself, rather than as a means. In the supply chain management field, for example, ample technology is already available to determine if a supplier is treating its workers fairly. However, both governments and companies often do not act upon this. While technology is being applied by some law enforcement departments to combat THB, resources need to be increased to match the global scale of the problem.

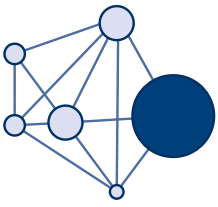
Recommendations relating to the role of government as buyer

10. Governments are encouraged to consider using technology tools to assess, identify and mitigate human trafficking risks in government procurement and also engage workers in their supply chains to prevent exploitative practices.

Governments are some of the biggest spenders in national economies and they spend financial resources to provide public services. Many public resources are being spent on procuring goods and services from economic sectors where the risks of human trafficking are high such as construction and infrastructure, telecommunication, food, agriculture, healthcare etc. Since

governments have a large number of direct suppliers, thousands or tens of thousands, it is very difficult to manage human trafficking risks without advanced analytical capabilities. This shortcoming is magnified by the large workforce in government supply chains which can span the globe. Therefore, procurement and sustainability departments are advised to use advanced technology tools to conduct thorough due diligence and improve government procurement transparency.

¹⁷⁰ See WePROTECT, "WePROTECT GLOBAL ALLIANCE — End Child Sexual Exploitation Online" [website] (WePROTECT, 2015). Available at: www.weprotect.org (accessed 8 May 2020).



Annex 1 - List of tech tools identified by Tech Against Trafficking and the Office of the OSCE Special Representative and Co-ordinator for Combating Human Trafficking as of December 2019

(For more details on the tech tools, check out Tech Against Trafficking’s Interactive Map at www.techagainsttrafficking.org/interactive-map/)

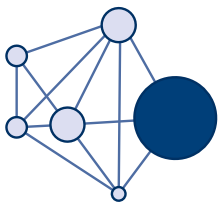
1	Alert Adventure	30	Bluenumber
2	TrataJuego	31	BlueView
3	(Un)trafficked	32	Bong Pheak
4	116 000 European Hotline for Missing Children	33	CameraForensics
5	1343 Actionline	34	CEASE.ai
6	24-hour Migrant Worker Hotline in Thailand	35	ChainPoint
7	Aangan mobile child safety app	36	Checkpoints for Companies – Eliminating and Preventing Child Labour
8	ACT!	37	“Checkpoints for Companies – Eliminating and Preventing Forced Labour”
9	AgriDigital	38	Child Exploitation Image Analytics
10	Amader Kotha	39	Child Exploitation Tracking System
11	Amazon Rekognition	40	Child Labor Tracking System
12	Ambrosus	41	Child MISS (Child Management Information System and Services)
13	Apprise App	42	Child Rescue Coalition - CPS Technology
14	Artemis’ Umbrella	43	Childline 1098
15	Automatic Identification System	44	childsafes.ai
16	Avatar	45	Commodities/Countries Risk Map
17	BAN Human Trafficking!	46	Commodity Mapping
18	BanQu Blockchain App	47	Community Sift
19	Baobei Hui Jia (Baby Come Home)’s PhotoMC	48	Comply Chain App
20	Be Free Textline	49	Content Safety API
21	Be My Protector	50	Contratados
22	Beacon	51	Counter-Trafficking Data Collaborative
23	Behind The Wall	52	Crisp Crisis Monitoring
24	Bext360	53	Cryptocurrency Forensics
25	Bitnation Refugee Emergency Response	54	CSR Risk Check
26	Blippar Augmented Reality App	55	CUMULUS Forced Labor Screen
27	Blockstack Browser	56	Cyber Trak
28	BlockVerify		
29	Bluemark		

57	CyberTipline	95	Ganz
58	Damon McCoy of New York University software	96	G-Coin
59	DarkCloud	97	GeoPoll
60	Datawake	98	GeoTraceability (GeoSurvey, GeoTrace)
61	DDIQ	99	Gfendr
62	Delta 8.7	100	Giant Oak Search Technology (GOST)
63	Descartes Labs Platform	101	Global Fishing Watch
64	Difféo	102	Global Human Trafficking Hotline Network
65	Dig	103	Global Kids Online Research Toolkit
66	Digital Globe	104	Global Slavery Index's Maps & Country Data
67	DORÆ	105	Global Sourcing Map (Primark)
68	Dubai Police App To Fight THB	106	Global Survey Index
69	Ecert	107	Golden Dreams
70	Ecodesk	108	Good Guide
71	EcoVadis	109	Good On You – Ethical Fashion App
72	Elementum	110	GPower
73	Elerts See Say	111	Grace City App
74	eMigrate	112	Grievance Reporting and Information Dissemination (GRID) system
75	eMin	113	Griffeye Brain CSA Classifier
76	End Slavery App	114	Guardian
77	Ending Human Trafficking podcast	115	Higg Facility Social & Labor Module
78	Engage, Enhance, Enable (former name: Tooday)	116	HooDat
79	Ethical Time	117	Hotline for Safe Migration and Anti-Trafficking +373 0 800 77777
80	Everex Wallet App	118	HourVoice
81	eyeWitness to Atrocities	119	Human Trafficking Ad Classifier
82	F1	120	Human Trafficking Analysis Dashboard
83	FacetSpace	121	Human Trafficking Text Classifier
84	Fair Hiring Toolkit	122	IdTraffickers
85	Fair Wage Guide	123	Idur - TP App
86	Fishcoin	124	ILO Infostories
87	Forced Labor Commodity Atlas	125	ImageCat
88	Forced Labor Risk Determination & Mitigation	126	ImageSpace
89	FRAMLx	127	Impulse Case Info Centre Software
90	Free2Work Barcode Scanning App 2.0	128	Incognito App
91	Freedom Collaborative	129	INHOPE's hotline and ICCAM System
92	Freedom Signal (Decoy Intercept chatbot, Victim reachout, Search ad deterrence tool)	130	Insight 3PM
93	Freedom! App	131	Integra 2.0
94	Gajimu Garmen	132	Interactive Map for Business of Anti-Human Trafficking Initiatives and Organisations

133	Intercept	170	Moldova Blockchain Project's Ethereum platform / identity system
134	International Child Sexual Exploitation database	171	Monitora 8.7
135	IOM Belarus Community on Viber App	172	Most Valuable Network platform
136	IOM Indonesia app to identify potential TIP cases onboard fishing vessel	173	mSpy
137	IOM Transnational Referral Mechanism	174	My Labor Matters
138	IOM X online Library	175	National Human Trafficking Hotline: VITA tool (Victim Translation Assistance Tool: Life Support Messages for Victims of Human Trafficking)
139	IOM-Mastercard Platform in Romania	176	New York City's Worker Connect
140	iReport App - Nigeria National Agency for the Prohibition of Trafficking in Persons	177	Nomi Network mobile-based training programme
141	iRespond's Biometric Private Key	178	North Carolina Farmworker's App
142	Iritech	179	OFW Watch App
143	ixo Protocol	180	Online Sex-work Risk Prediction App
144	Just Gold Traceability & Due Diligence System	181	Operation Compass App
145	Just Good Work	182	Operation Predator App
146	KoboToolbox	183	Operation Red Alert (My Choice Foundation)'s helpline 1800 419 8588
147	Labor Safe Screen plug-in	184	Orbital Insight GO
148	LaborLink	185	Origins
149	Laborvoices Smartline	186	Outflank Pay Tracker
150	LegalFling	187	Oyoty App
151	LegisGATE	188	Pantau Pjtki
152	LEXI App	189	PENCIL
153	Lighthouse	190	Philippine Overseas Employment Administration
154	Línea 145 - Asistencia y denuncias por trata de personas	191	PHOTODNA
155	Magnet.AI	192	Phylagen
156	Mapped in Bangladesh	193	Planet
157	Martine Jarlgaard - Provenance	194	Poptropica
158	Memex Explorer	195	PredPol Algorithm
159	MICIC App	196	Prewave
160	MicroBenefits CompanyIQ App	197	ProActive
161	MigApp	198	"Products of Slavery"
162	migratiesigura.md	199	Progress Reporting Tool
163	Mimosi	200	Project Arachnid
164	Minerva Platform - Global Emancipation Network	201	Provenance
165	Minespider	202	Pulse
166	Miniila App	203	PURE (CR360)
167	MINTRAX	204	Qumodo Ecosystem
168	Missing: Game for cause	205	RADIX Tree
169	Modern Slavery Registry		

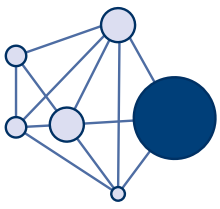
206	Rapoto@ Shpeto	244	South African National Human Trafficking Resource Line (0800 222 777)
207	RAVOT-EUR	245	South Asia Case Management System
208	Record My Hours App	246	Spartacus: A Global Mobile Platform for Empowering Migrant Workers to End Slavery
209	RecruitmentAdvisor	247	Spotlight
210	Redlight Traffic App	248	Spotting Trends
211	Reroute - AI to Combat Human Trafficking	249	STOP (Sex Trafficking Operations Portal)
212	RESPECT Resource Centre	250	STOP APP
213	Responsible Recruitment Toolkit	251	Stop CSE App
214	Responsible Sourcing Tool	252	Street Grace "Transaction interception software"
215	Riddle & Code	253	String3
216	Risk 360	254	Stylometry classifier, Bitcoin linking technique to identify human trafficker
217	Roadmap for social responsibility	255	Supplier Compliance Manager
218	SAFE App	256	Supply Chain Interactive Map (Marks & Spencer)
219	Safe Car Wash App	257	SupplyShift
220	SafeCity	258	Support for Migrants App
221	Safenight App	259	Sustainabill
222	Safer	260	Sweat & Toil: Child Labor, Forced Labor and Human Trafficking Around the World
223	SAFER (former Leaf Wearables)	261	Sweetie 2.0
224	SaverAsia	262	Symphony
225	Seafood Slavery Risk Tool	263	TACT Transnational referral mechanism Model (TRM)
226	Sedex Advance	264	Telefono Azzuro
227	Shocard	265	Tellfinder
228	Shop Ethical! App	266	TexTrace
229	Shuvaytra	267	This is My Backyard (TIMBY)
230	SigNature DNA	268	ThreatNix
231	Sigur Online	269	Tip Line App
232	SISACTE	270	TISCreport Modern Slavery Act Compliance Tracker
233	Slave Free Trade App	271	Trace Register
234	Slavery and Trafficking Risk Template	272	Trace The Face
235	Slavery Footprint	273	Traceology
236	Slavery from Space	274	Tracr
237	Snorkel	275	Traffic Jam
238	Software developed at The Carnegie Mellon University in Pittsburgh by a researcher called Eduard Hovy	276	TraffickCam
239	SoJustShop Mobile App	277	Trafficking in Persons Information System
240	Solis	278	Trafficking In Trinbago App
241	Sourcemap		
242	SourceTrace		
243	South African Counter-Human Trafficking Resources		

279	Trafficking Risk in Sub-Saharan African Supply Chains
280	Traffik Analysis Data Hub
281	Transit Monitoring & Interception
282	Transparency-One
283	TraSeable Solutions
284	TuanYuan App
285	UglyMugs App
286	UK Modern Slavery Helpline
287	University of California, Berkeley - tech to identify adult ads tied to human trafficking rings
288	Unseen App
289	Unseen Pan-European Victim Case Management System
290	uPort
291	Verifier TD&B (Travel Document and Bearer)
292	Verité Knowledge Portal
293	Victim Case Management System (Liberty Shared)
294	Video Image Classification Standard
295	Washington Trafficking Help
296	Web-IQ Voyager
297	WFP Building Blocks
298	Whatsapp helpline in Bihar
299	Worker Connect App
300	WorkIt App
301	WOVO
302	Yoti
303	You Have A Voice App
304	Zero Abuse AI
305	ΦΟΠ



Annex 2 - Technology definitions

Technology	Definition
Deep/Dark Web Technologies	Applications or platforms helping in retrieving and uploading data from and into domain within the deep and/or dark web.
Artificial Intelligence	The simulation of human intelligence processes by machines, especially computer systems. These processes include learning (the acquisition of information and rules for using the information), reasoning (using rules to reach approximate or definite conclusions) and self-correction.
Big Data	Extremely large data sets that may be analysed computationally to reveal patterns, trends, and associations, especially relating to human behaviour and interactions.
Blockchain	A growing list of records (called “blocks”) that are linked using cryptography. When used as a distributed ledger, it can record transactions between two parties efficiently and in a verifiable and permanent way.
IoT	A system of interrelated computing devices, mechanical and digital machines provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.
Machine Learning	A branch of artificial intelligence, machine learning is a method of data analysis that automates analytical model building.
Mobile Platform	Applications or software designed to run on mobile platforms and can be used or accessed via a mobile phone.
Network Platform/ Search Engine	A web-based tool or software that enables users to locate information on the World Wide Web.
Radio Frequency	Referring to electromagnetic radiation in the range of frequencies lower than microwaves. Radio-frequency engineering is incorporated into almost everything that transmits or receives a radio wave, which includes, but is not limited to, mobile phones, radios, Wi-Fi, and two-way radios.
RFID	Radio-frequency identification (RFID) uses electromagnetic fields to automatically identify and track tags attached to objects.
Satellite Technology	Referring to software or applications which use satellite for communication, tracking, navigational or monitoring purposes.
Web-/Cloud-Based	Referring to software which is hosted exclusively on servers and accessible via the Internet.



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