TECHNOLOGY AND HUMAN TRAFFICKING: RECONSTRUCTING THE NEXUS

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ABSTRACT

With the evolution of information and communication technology, perpetrators of human trafficking conceal themselves in the anonymity of cyberspace and manipulate the ciphertext to their advantage, even more during the COVID-19 pandemic. Traffickers have employed several tactics to groom and recruit vulnerable individuals and to transmit images of online sexual exploitation of children (OSEC) and child sexual abuse materials (CSAM) through mobile applications and social media platforms. This paper examines how different technologies can be utilized to prevent and protect vulnerable groups from being victims of human trafficking in an urban environment. From the content analysis of 38 applications, it was noted that 10 could be accessed through any web browser, 13 were standalone software, and 15 were mobile-based application. The study also identifies the various features multiple stakeholders use in the technology platforms and underscores the need for multi-stakeholder partnerships in combating human trafficking. The paper emphasizes the gaps and challenges in the available technology and its applications in various anti-trafficking efforts. As a way forward, it provokes the need for predictive technological advancements to tackle the clandestine crime of human trafficking.

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Urban Crime - An International Journal, Vol 3, No 1, ISSN 2732-6187.

Keywords: Human trafficking, technology, trafficker, COVID-19, CSAM

Introduction

With the highest number of victims of trafficking, India is a source, transit, and destination country for human trafficking. India has, so far, shown a commitment to prevent this type of victimization even after being a signatory to international conventions, including the UN Protocol to Prevent, Suppress and Punish Trafficking in Persons (Shekhar and Somasundaram, 2019). Women and children are trafficked for various purposes, including forced and exploitative labour, farms and private households, sexual exploitation, forced marriage, etc. The crux of the problem is that the trafficking of women and children, a highly secretive and clandestine trade, remains underreported and untraced (Parliament Standing Committee on Home Affairs, 2021). Men and boys are trafficked and exploited too, primarily for labour, including debt bondage or bonded labour, domestic servitude, and boys for forced child labour and unlawful recruitment and use of child soldiers. Child soldiering is a form of child trafficking because the acts that the child is required to do are dangerous. It interferes with the child's fundamental human right to education, health and development (Rios-Kohn, 1998). The abduction and employment of children as soldiers is a form of exploitative labor that is tantamount to slavery (Tiefenbrun, 2007). At least 1.2 million children are trafficked annually for child labour and sexual exploitation. Most child labourers are in the informal economic sector, where laws and regulations do not protect them. The worst forms of child labour are illegal and must be eradicated immediately. While recent research has yielded information on the nature of child trafficking, little is known about its magnitude (International Labour Organization, 2002).

Human trafficking has been estimated to be the third-largest organized crime globally. The COVID-19 pandemic seems to have only exacerbated it further (Chawla, 2021). The motive of traffickers — regardless of the type of human trafficking they are engaged in — is clear: money! Annually, the business of human trafficking globally generates an estimated $150 billion in profits (Niethammer, 2020). With the onset of the COVID-19 pandemic, traffickers have adapted to the situation by switching to technology-based platforms more than ever before. With school closures, children and adolescents spend more time online, increasing risks leading to trafficking situations. The National Center for Missing and Exploited Children noted an increase from 2 million to 4.2 million reports of online exploitation from March to April 2020 (Todres and Diaz, 2020). The modalities with which human traffickers operate, mainly digital technology, have brought more

challenges in identification, rescue and prosecution. Without the urgent intervention to this new trend of human trafficking through technological usage, the level of exploitation would be enormous.

Perpetrators and their associates are using technology in many stages of human trafficking crime, including recruitment, movement, control, advertising 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 (Organization for Security and Co-operation in Europe, 2020). Children and young female adults are specifically vulnerable as they are prone to be groomed online by exploiting insecurities and trust (Thorn, 2020). Talking about the increase of online child sexual abuse (CSA), in 30 years we've moved from 7,000 to 17 million CSA images. Online CSA is a big data problem in terms of the variety, velocity and volume of this content, and we will need artificial intelligence solutions to tackle the problem (Martellozzo, 2021). Though finding victims, following money trails, and confronting the culprits, can take a considerable amount of time, artificial intelligence (AI) software and tools can augment the process and help take timely measures to prevent human trafficking and catch the perpetrators (Beatrice, 2021).

While perpetrators are becoming more tech-savvy and are capable of using the latest technology to the fullest to their advantage, the same is, unfortunately, not true of actors who are responsible for fighting against trafficking in human beings (Delacoux, 2020). Even with the digital investigation techniques put to use, only some attention has been given to the investigation of technology-enabled human trafficking to obtain digital evidence (Organization for Security and Co-operation in Europe, 2020). However, there is an inadequate effort from the governments to allocate resources or to explore the domain of application of technology in an effective way to tackle trafficking in human beings, particularly concerning prevention of crime and protection of vulnerable people. Although some good examples exist in the OSCE area and beyond on the use of technology by law enforcement 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 (Organization for Security and Co-operation in Europe, 2020).

With the increasing dependence on the ever-changing technologies, cyberspace has also become a breeding ground for criminals. The demand for sexual exploitation of victims has reached new levels with the increasing consumption and supply of pornographic content in open internet and dark web arena. Additionally, the anonymity offered by cyberspace has been manipulated by traffickers to find suitable targets, groom them, and reach out to clients to provide "services" and for financial transactions. Despite the collaboration with civil society organisations, and general public at various levels, putting an end to trafficking is still a huge challenge faced by law enforcement in all the countries. Therefore, it is important to carry out research in cybercrime, particularly in understanding how the offenders have used technology. In addition, it is pertinent to see how the same technology has been used by law enforcement and civil society organisations to disrupt trafficking. This study does the exact and further highlights how innovative solutions can be brought to equip the stakeholders committed to stopping trafficking.

Legal Framework

United Nations Convention against Transnational Organized Crime (UNTOC) which was adopted by the General Assembly resolution on 15 November 2000, is a significant step forward in the fight against transnational organized crime. The Convention is further supplemented by three Protocols, which target specific areas and manifestations of organized crime: the Protocol to Prevent, Suppress and Punish Trafficking in Persons, Especially Women and Children; the Protocol against the Smuggling of Migrants by Land, Sea and Air; and the Protocol against the Illicit Manufacturing of and Trafficking in Firearms, their Parts and Components and Ammunition (United Nations Office on Drug and Crime, 2004).

Several countries have brought in laws to address human trafficking in different forms. The Trafficking Victims Protection Act (2000), Preventing Sex Trafficking and Strengthening Families Act (2014), Justice for Victims of Trafficking Act (2015) and other State laws in the United States of America, Modern Slavery Act (2015) in the United Kingdom, Duty of Vigilance (2017) law in France, the Modern Slavery Act (2018) in Australia, and the Child Labor Due Diligence (2019) law in the Netherlands are a few laws that have been enacted to counter human trafficking. Canada too had then introduced two human trafficking Bills in the Canadian Parliament (Bill C-423 in 2018 and Bill S-211 in 2020), and the Bill-S216 introduced in March 2021 had passed its Second Reading in the Senate and was referred to the Standing Senate Committee on Banking, Trade and Commerce for further study (Clarke *et. al.*, 2021).

In 2015, according to an order of the Supreme Court,[3] the Ministry of Women and Child Development constituted a Committee to examine the feasibility of comprehensive legislation on trafficking. In 2018, the Trafficking of Persons (Prevention, Protection and Rehabilitation) Bill, 2018 was introduced in *Lok Sabha* and passed in that House (PRS Legislative Research, n.d.) but was never taught in the *Rajya Sabha* for it to become an Act as the prescribed time had lapsed.

In June 2021, the Ministry of Women and Child Development had again invited comments/ suggestions from all the stakeholders on the draft 'Trafficking in Persons (Prevention, Care and Rehabilitation) Bill, 2021'. The Bill, once finalized, will be sent to the Cabinet for approval and then for the assent of both the houses of Parliament to become an Act. This Act shall apply to every offence of trafficking in persons with cross-border implications (Press Information Bureau, 2021). While the 2018 Bill dealt with trafficking, rescue, protection and rehabilitation of victims, the 2021 Bill expands the scope to include offences outside India (Dasgupta, 2021). This Bill was expected to be introduced in the *Lok Sabha* in the Monsoon Session (July-August) of the Parliament in 2021 but was not.

2030 Sustainable Development Goals (SDGs) related to Human Trafficking

Trafficking in persons is included in the 2030 Agenda, including efforts to abolish modern-day slavery and other related goals. In that sense, the SDG Declaration is committed to eradicating forced labour and human trafficking. The situation of trafficked women and children is given special recognition (International Organization for Migration, 2017).

Target 8.7 of the SDGs calls explicitly for States to: "*Take immediate and effective measures to eradicate forced labour, end modern slavery and human trafficking (by 2030) and secure the prohibition and elimination of the worst forms of child labour, including recruitment and use of child soldiers, and by 2025 end child labour in all its forms"* (Department of Economic and Social Affairs, n.d.).

An important initiative offering an opportunity to accelerate progress towards Target 8.7 is Alliance 8.7 — an inclusive global partnership that includes countries, international and regional

[3] Prajwala vs. Union of India 2016 (1) SCALE 298.

organizations, workers' organizations, employer and business membership organizations, civil society organizations, academic institutions and other relevant stakeholders and networks. Under this initiative, these actors collaborate, strategize, share knowledge and accelerate progress to achieve Target 8.7. Currently, 22 countries are partners to Alliance 8.7 (United Nations Voluntary Trust Fund on Contemporary Forms of Slavery, 2019).

Almost all the SDGs are interconnected. However, in the context of bonded labourers (one of the purposes for trafficking for labour), SDGs 5, 8 and 16 highlights the key issues to be addressed. The SDGs need to be translated into practical realities by implementing legal frameworks, policies, and schemes. The action plan should be inclusive, ensuring no one is left behind (Jacob, 2021).

Recent Trends in Trafficking in Persons

Generally, it is found that women and children often become the victims of sex trafficking whereas, men are more prone to be victims of debt bondage and forced labour. As per the UNODC global report 2020, over the last 15 years, the number of detected victims has increased for both females and males, but the number of detected men, boys, and girls has increased more than women, so the profile of the victims detected has changed (UNODC, 2021).

According to International Labour Organization (ILO) in 2016, 40 million people were victims of modern slavery, including 25 million people in forced labour and 15 million people in forced marriage. Women and girls accounted for 71 percent of modern slavery victims. Debt bondage affected half of all victims of forced labour imposed by private actors. One in four victims of modern slavery was children. There were 5.4 victims of modern slavery for every thousand people in the world in 2016. There were 5.9 adult victims of modern slavery for every 1,000 adults and 4.4 child victims for every 1,000 children in the world (International Labour Organization, 2017).

The US national human trafficking hotline in FY 2019 reportedly received 136,990 calls, texts, chats, online tips, and e-mails from across the country and its territories. They were able to identify 11,852 potential human trafficking cases and provided resources and referrals to 3,828 potential victims (US Department of State, 2020).

According to the 2020 UNODC global report on trafficking in person, South Asia is an origin area for trafficking to the rest of the world. Among the victims of trafficking in South Asia, 36% of

them were sexually exploited, 52% were engaged in forced labour, and the remaining 12% were trafficked for other forms of exploitation. The largest group of detected victims continues to be women (44%), with a large share of children, both girls (21%) and boys (24%). This region records among the highest percentage of children among total victims detected, second only to Sub-Saharan Africa (United Nations Office on Drug and Crime, 2021). UNODC has been focusing on bringing down cybercrime to prevent and counter exploitation of children online.

A survey conducted by Nair (2004) among 412 brothel owners in India found 198 owners admitting to having minors between 16-17 years old in their establishments. Additionally, 82% of respondents admitted to selling girls younger than 16 years of age. The purchase price of girls tends to fall as victims get older, which similarly indicates that trafficking is most likely to occur at young ages. Data from the study shows that, from 2009, for a customer, the average price per sex act was INR249 (USD3.34)[4] depending on the nationality, age, or other factors about the girl.

Children continue to be targeted for commercial sexual exploitation (CSE) in religious centres or tourist destinations in India and are predominantly trafficked to Delhi, Gujarat, Kolkata, Mumbai, and along the India-Nepal border. Traditional customary prostitution also exists as a manifestation of CSE throughout India, permitting very young minor girls between the ages of 9 and 13 to be trafficked for the purpose of temple prostitution where they are dedicated to various gods/deities. They are first abused by temple priests and then usually sold or auctioned to brokers for CSE. Often, family members sell and broker the deal in customary prostitution. Religious prostitution is predominantly practiced in Karnataka, Maharashtra, and Andhra Pradesh. Tribal prostitution is another form of CSE where girls from certain villages like the Bedia communities are culturally expected to enter the sex trade as a learned craft (International Justice Mission, 2017).

In 2016, a total of 63,407 children were reported missing. 63,349 and 67,134 children have been reported as missing in the two subsequent years. Among States/UTs, the State of Madhya Pradesh remains on top in 2016, 2017 and 2018 with 8,503, 10,110 and 10,038 missing children, respectively. The State of West Bengal is a close second during 2016-18, with 8,335 in 2016, 8,178 in 2017 and 8,205 in 2018 (National Crime Records Bureau, 2019).

[4] USD1 = INR74.34 as on 22nd August 2021.

According to the Crime in India reports published by the National Crime Records Bureau, a total of 2,260 cases of human trafficking were registered in 2019 compared to 2,278 cases in the year 2018, showing a decrease of 0.8%. A total of 6,616 victims have been reported to be trafficked in which 2,914 children and 3,702 adults were trafficked in 2019. Among the 3,702 adult victims, 2,907 were women. Apart from this, 6,571 victims have been rescued from the clutches of traffickers among which 2,837 were children and 2,964 were women. Among these rescued victims, 6198 were from different states in India, 228 were from Nepal, 98 were from Bangladesh, and 47 from other countries that are not mentioned in the report. A total of 5,128 persons were arrested in 2,260 cases of trafficking. Among the cases reported for human trafficking from 2017-2019. Although 5128 persons were arrested and 3638 were subsequently charged in India for human trafficking in 2019, only 324 were convicted (National Crime Records Bureau, 2019). It is important to note that the cases recorded in NCRB are based only on the reported cases and that many cases do not come to the police due to fear of stigma and lack of awareness and non-identification of victims.

Technology Enabled Human Trafficking

Traffickers use the internet to connect with the targeted victims. The virtual space has reduced the costs and risks involved for the traffickers, and it also gives an advantage of anonymity. When it comes to both sexual exploitation and forced labour (United Nations Office on Drug and Crime, 2021). A comparative research study examined the commercial sexual exploitation of trafficked victims in four countries – Jamaica, Japan, the Netherlands, and the United States of America. The study concluded that technology had become the single greatest facilitator of the commercial sex trade in all countries observed, except for Jamaica where word of mouth dominates (Shared Hope International, 2007). There are three stages to commercial sexual exploitation: acquisition, movement, and exploitation. First, the traffickers use violence, financial coercion, romance or fake job offer to make the vulnerable people fall into their trap. Secondly, once the potential victim trusts, the traffickers start to transport or move them to a suitable destination safe for exploitation. Finally, the victims are deprived of their freedom of movement and subjected to any form of violence (Kara, 2009).

The modus operandi is the same when recruiting for labour exploitation. Labourers are drafted with an advance amount paid for the individual or the whole family; the recruited are transported in trains to the destination and then exploited at the worksites. They are restricted from their

movement and freedom to seek employment in other worksites to pay back the debt. Individuals who are trafficked for labour become bonded in various industries and undergo extreme and harsh environments where they endure abusive masters and pathetic living conditions. The victims are forced to work for long hours and are not paid the minimum wages. The victims are constantly threatened and coerced to work for years together in the workplace due to a meagre advance they had taken for the owner (Vincent, 2019). According to the World Health Organization (WHO), victims of trafficking are often drugged, raped repeatedly, beaten till unconscious, and forced to drink (Krug et al., 2002).

Victims are threatened and forced to use technology to advertise themselves. The trafficker uses technology to upload photos of victims on discreet websites and social media platforms to entice customers. Many victims from underprivileged or poor backgrounds did not own mobile phones before being trafficked. The victims who owned mobiles before trafficking used basic handsets without much internet connectivity. After being trafficked, many upgrade their mobile phones to reach the maximum number of clients. Many victims who find their potential clients by simply surfing various social media sites reported Facebook and Twitter as the best platforms. The victims send their photo advertisements several times to reach more potential customers. Victims showcase explicit profile pictures and videos on dating applications, online video chats, and other websites to advertise themselves.

Traffickers

Traffickers frequently change their mobile numbers to escape from being detected. They also create and publish online advertisements stating attractive jobs or matrimonial offers to lure young women and children. With a potential client, traffickers communicate all descriptions about the victims before a deal is made. They communicate victim's contact and other profile information, details of sexual acts performed, pornography of the victim, prices, and reviews of the previous clients. This information is also available under different categories such as age, gender, race, etc. Further, online auctions also take place for pornography.

When traffickers recruit victims online, they are likely to avoid using the victim's picture online. While many victims hide or blur their faces on online advertisements, some of their pictures were morphed to look older. Photo swapping, where the face is edited onto the body of the other, is also done by traffickers for photo advertisements.

The cost of online advertising of services is considerably low, providing greater flexibility to the offenders. A study 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. As much as 42% of traffickers were found to use online tools to build relationships with their victims (Thorn and Bouche, 2018). Traffickers use technology to hide their identity, store data and host their services. They also use advanced encryption technologies to avoid getting caught in forensic investigation. Media reports have depicted in many cases that the traffickers use online video game platforms to target potential victims, primarily children (Thorn and Bouche, 2015). Interviews with 260 U.S. survivors of human trafficking found that 75% were advertised online for sexual services (Thorn and Bouche, 2018).

Traffickers may take advantage of particular features of the social media platforms, such as encryption of messages, membership-based on personalized profiles, and hosting groups of users with specific interests. They may also use internet-based services to carry out anonymous online payments or to distribute pornographic material. According to a report, one trafficker mentioned that social media applications such as Facebook, Twitter, WhatsApp and Viber were the easiest and quickest ways to communicate and that the trafficker would get around 10-50 people as customers (Di Nicola, Baratto and Martini, 2017). Law enforcement reports that private groups in communication tools such as Telegram and WhatsApp are being used for advertising sexual services to large communities, especially in Eastern Europe. Using messaging apps, such as KIK, KakaoTalk, WeChat and WhatsApp, is widely used by traffickers to recruit victims, especially children (Polaris, 2018). Besides, WeChat is also widely used by traffickers to communicate with victims and buyers (Thorn and Bouche, 2018).

Customers/Clients

Customers use the internet and mobile technologies to search, use and pay for services. They can find services within their location and interact with the victims online before meeting in-person. Moreover, clients interact to help each other find a suitable victim for their needs. They use chat rooms and dating sites to search for services. They view victim's profile information, exchange mobile numbers, e-mail addresses for future dealings. Many clients prefer online payments and widely use online banking or quick money transfer services to transact their amount to the traffickers' account (Sarkar, 2015).

Relevant Technologies to Combat Human Trafficking

With the ever-increasing digital content in this era, it is impossible to review every single one and understand the bigger picture of modus operandi without proper technical tools. The technology which offenders manipulate can also be the solution to stop them. In 2018, Vodafone, BT, Microsoft, Amazon, Nokia, non-profits, and the UN launched Tech Against Trafficking, a collaborative effort to address forced labour and human trafficking. One of the group's first things was to compile a list of almost 200 apps, tools, and data-driven projects (PDF) that help identify victims and criminals involved in modern-day slavery. United Nations' Global Initiative to Fight Human Trafficking Hub (UN.GIFT.HUB) identified five technology tools such as FRDM, POEA Mobile, Palantir, PhotoDNA and Spotlight that are known to assist in the fight against human trafficking (United Nations' Global Initiative to Fight Human Trafficking Hub, 2017). These tools include blockchain, artificial intelligence, facial recognition, and phone apps (Combs, 2019).

Caveats of the Study

The study was conducted over one month using publicly available sources. However, not all applications used by the law enforcement agencies in India are made public due to security reasons. Police departments in each State have their go-to applications for identification and investigation purposes. Still, they are never discussed in any forums and hence, they are not part of this study. This study does not cover the application's impact as it would require an in-depth research to ascertain its level of functioning.

Objective and Methods

This study seeks to address the current information gap in India about the use of technology to combat trafficking in human beings and empower anti-trafficking actors with knowledge and information that could help enhance the power of technology to fight the exploitation of individuals. The current study presents scope for innovation in the application of technology as an important response to equip the law enforcement, civil society organization, and the public, in general, to fight human trafficking in India. This study perused articles and reports from secondary sources subjected to content analysis. Content analysis is described as the scientific study of communication content (Prasad, 2008). Each file was examined exhaustively using content analysis, and information about each case was extracted and categorized. During the one-month

secondary research, 38 applications were identified that were being utilized by various stakeholders for their anti-trafficking activities. The summary of the study findings on the type of applications (Fig. 1) and the main features (Fig. 2) used by different stakeholder groups are shown.

Fig. 1: Different types of applications used by various stakeholders for anti-human trafficking activities

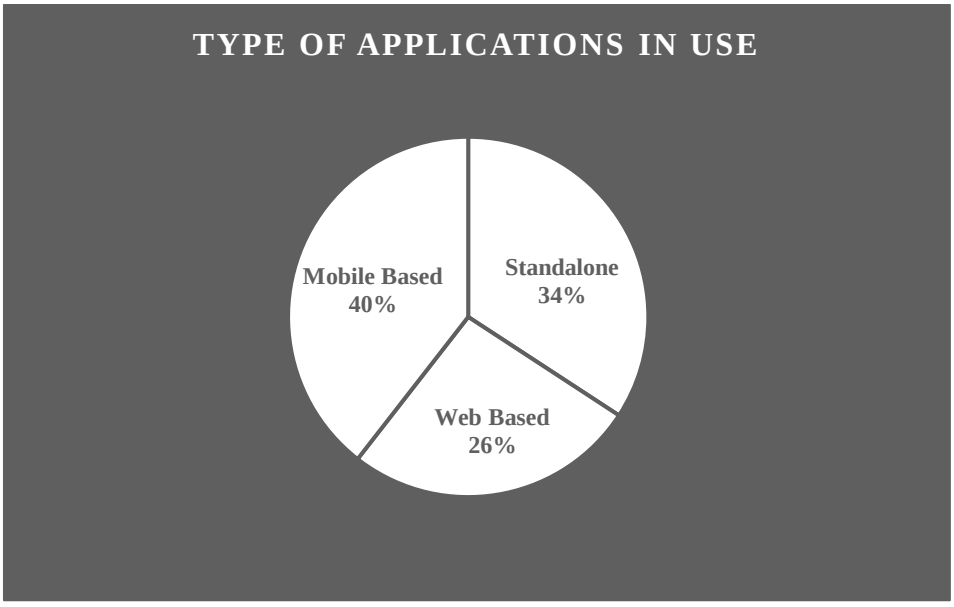
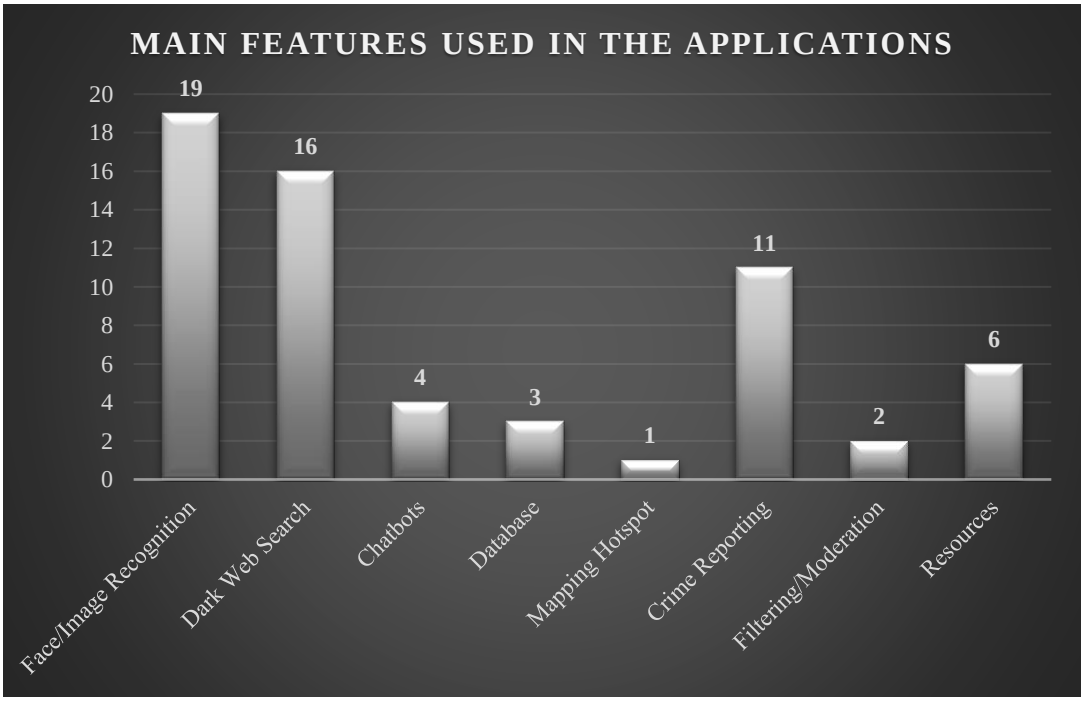


Fig. 2: The various features within the applications used by various stakeholders for anti-human trafficking activities



Study Findings

While the tools used by law enforcement are primarily standalone and web-based, the applications used by the general public and victims are primarily mobile-based. Among the 38 applications identified, 13 (34%) were standalone software requiring the application to be installed on a smartphone or computer/laptop. There were 10 applications (26%) that could be accessed through any web browser and 15 (40%) mobile-based applications. This offers an advantage for the general public and victims to access these applications on the go. However, law enforcement might not necessarily use applications on the go as their work might require an office setting.

Fourteen applications have been identified as those based in the USA, three in Canada, four in India, and one each in Thailand, UK, and Sweden. Nine applications were reported as being used in multiple countries despite their origin in different countries. The country of origin was not determined for six of the applications as the application might have been developed by multiple stakeholders. It was noticed that two applications operating in India — Kavalan SOS and Operation Red Alert, doubled as an application for resources and as a hotline for victims and informers to call in with information of risks and human trafficking cases.

Law enforcement agencies utilize 18 applications (Table 1). Only PhotoDNA applications can be used as both standalone and web-based applications. Figure 3 shows the features used by law enforcement agencies.

Table 1: List of applications used by law enforcement agencies

Name of the Application	Type of Application	
	Standalone	Web Based
PhotoDNA	✓	✓
Griffeye Analyze	✓	
Project VIC	✓	
F1 Video Fingerprinting Technology	✓	

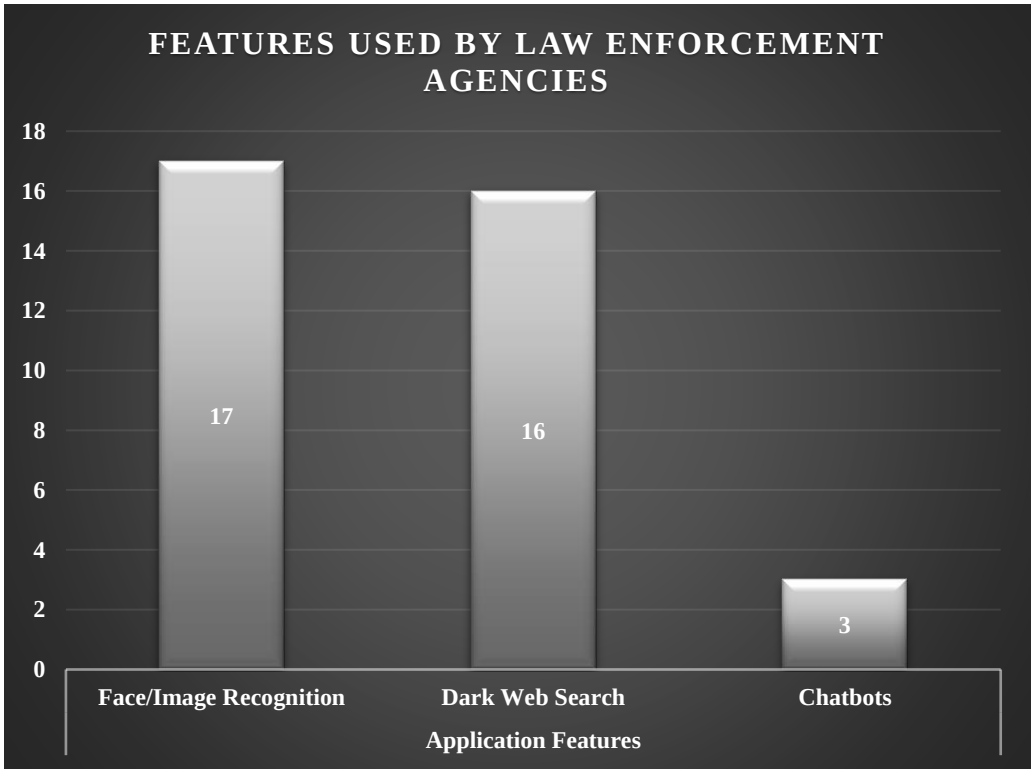
Domain-specific insight graphs (DIG)	✓	
Paliscope	✓	
Cease.ai	✓	
Delitor	✓	
DeepDive	✓	
iGAT		✓
Child Protection System		✓
TellFinder		✓
Freedom Signal		✓
Spotlight		✓
idTraffickers		✓
Artemis		✓
Minerva		✓
Halt and Path	✓	

Law enforcement agencies and NGOs have been increasingly using applications to identify and weed out child sexual abuse materials (CSAM) from the internet. Out of the 38 applications, the law enforcement agencies utilize 16 applications, of which 14 applications were used to focus on identifying and removing CSAM online. The other applications' focus is on creating awareness of human trafficking, providing a secure platform for reporting human trafficking activities and providing resources on human trafficking. All the applications have been developed by a combination of stakeholders such as academia, tech companies, NGOs, service providers &

business entities, church groups and the government (law enforcement) working collaboratively to address the different aspects of human trafficking.

The law enforcement agencies use the applications to search for clues or leads that can vary from simple text messages and images to video footage on the internet. Applications can pinpoint by matching images and information acquired to the exact source in the dark web. Minerva application, in particular, helps the law enforcement agencies to cull out metadata of texts, images and other documents as evidence and helps share data to other stakeholders, if needed, in a secure manner. PhotoDNA and idTraffickers applications based on image-identification technology assist law enforcement agencies in detecting CSAM and other illegal content. The Paliscope application has two main tools: Discovery and Yose. Discovery helps in structuring data and building a case, Yose helps instantly track all kinds of information within the local collection of unstructured data.

Fig. 3: Application features used by law enforcement agencies



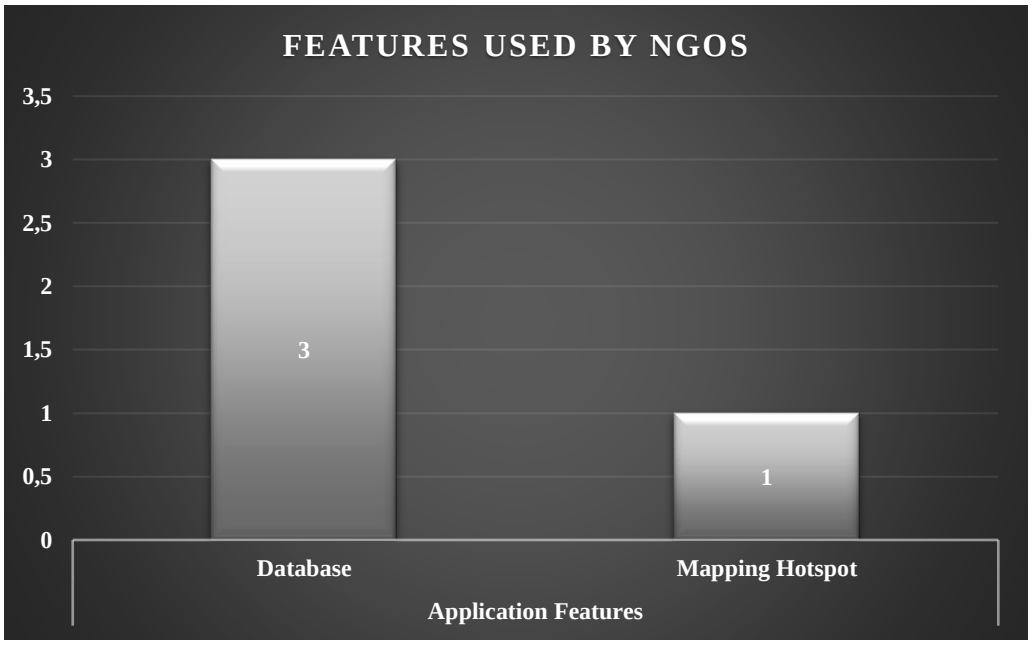
National and international NGOs have been found using four applications in this study. Table 2 lists the applications, and Fig. 4 shows the features that the NGOs make use of.

NGOs utilize applications to identify, document, store data on human trafficking incidences and create awareness on human trafficking by providing resources and media campaigns. They build databases to store and retrieve data on victims, nature of victimization, industry type, rescue information, rehabilitation processes and their repatriation details. They also support creating a visual representation of the hotspot and trends in human trafficking in their regions of operation. In almost all the 38 applications looked into, NGOs have played a crucial role in developing the application based on their experiences working with various stakeholder groups on the ground. Other civil society organizations have also pitched in to develop applications for anti-human trafficking activities. The Safe Car Wash and Redlight Traffick are applications that church groups have contributed to law enforcement and NGOs. Apart from developing applications, NGOs have established 24x7 helplines to assist in emergencies related to human trafficking. These helplines provide (potential) victims and survivors with resources and appropriate services, including trauma-informed care.

Table 2: List of applications used by NGOs

Name of the Application	**Type of Application**	
	Standalone	**Mobile Based**
Operation Red Alert		✓
Victim Case Management System	✓	
G-Power		✓
IBM i2 Intelligence Analysis Software		✓

Fig. 4: Application features used by Non-Governmental Organizations (NGOs)



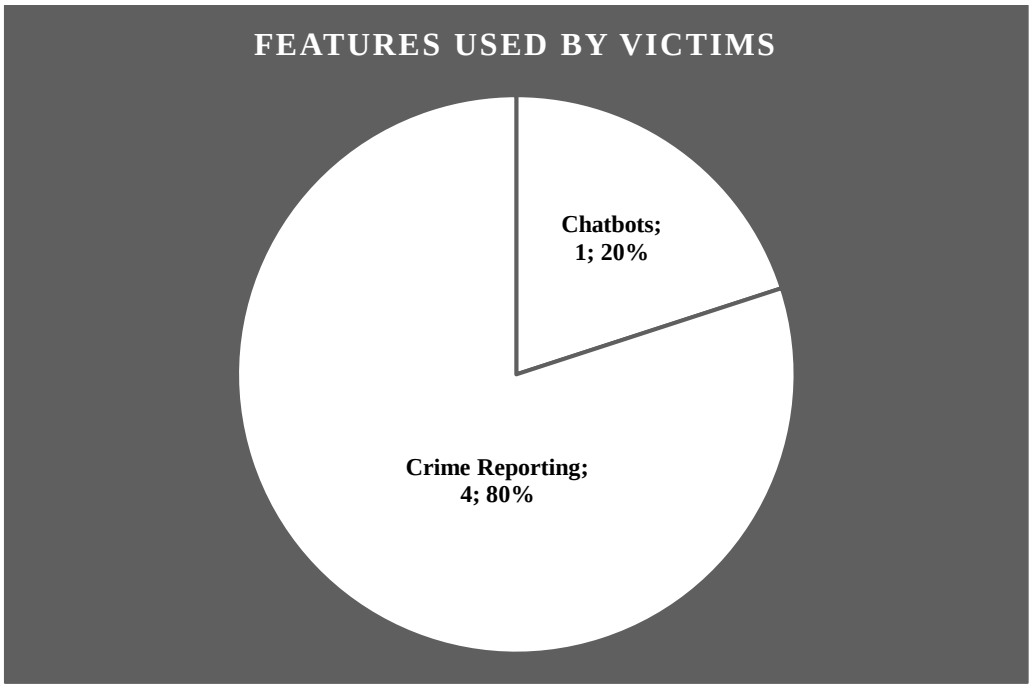
A few applications developed by tech companies in partnership with the government and civil society organizations cater to victims of human trafficking. Table 3 lists the applications predominantly used by victims, and Figure 5 shows the features commonly used within the application. With multi-stakeholder collaboration, applications have been developed so that victims can contact law enforcement and other civil society organizations for assistance in a discreet manner. Vulnerable individuals and victims, who are in risky situations, and informers, can report human trafficking incidences on the go as they can download and use mobile-based applications. Victims can also use chatbots to inquire about the various services available, share their victimization, and get guidance for the next steps.

Table 3: List of applications used by victims

Name of the Application	**Type of Application**
	Mobile Based
YWCA Safety Siren	✓
Companion Chat	✓
Amobile That	✓

The Safe Car Wash	✓

Fig. 5: Application features used by victims



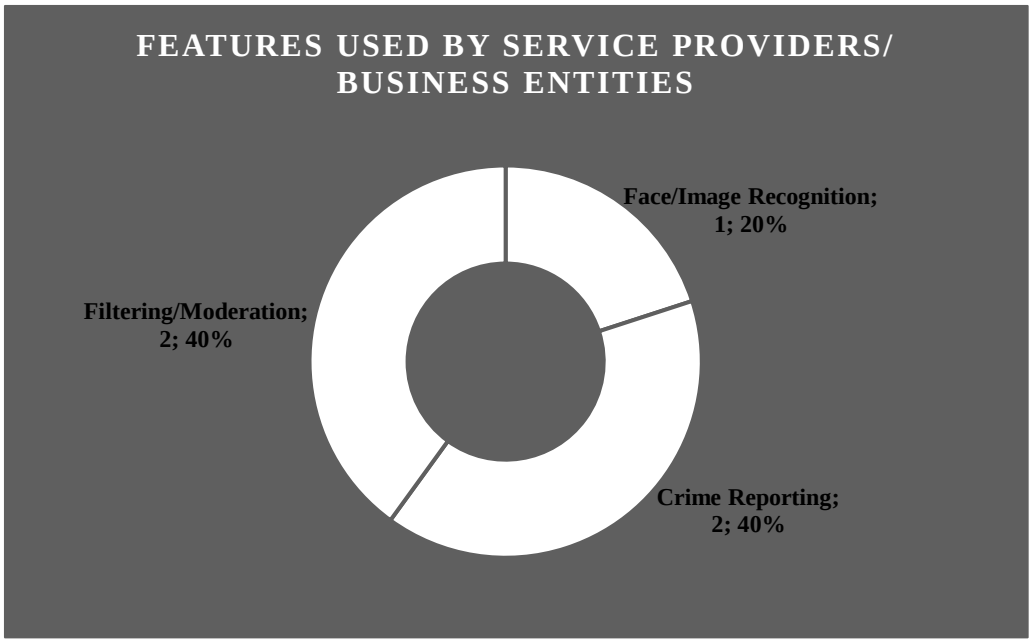
Service providers and business entities have ventured into anti-human trafficking activities to keep their supply-chain clean as it tarnishes their brand name in the market. In collaboration with tech companies and grassroots NGOs, businesses and service providers have been using applications for redressal mechanism as listed in Table 4. The commonly used features are shown in Fig. 6.

Businesses and service providers are now starting to contribute to addressing the menace of CSAM by partnering with NGOs, academia and tech giants to develop applications such as Cease.ai by utilizing artificial intelligence to detect and remove CSAM from the internet. NetClean application is now solely used to protect electronic devices owned by businesses by preventing access to CSAM proactively. Companies have also started to monitor their employees' online activities by identifying whether contents generated, used or accessed by employees or users are CSAM. Businesses now use the Slavery Footprint application to create awareness of the slavery-like conditions in various industries and global supply chains. Through surveys and other resources, the user is made aware of the plight of the enslaved individuals in the supply chains that create the products we consume daily.

Table 4: List of applications used by service providers and business entities

Name of the Application	Type of Application	
	Standalone	Web Based
Slavery Footprint		✓
NetClean	✓	
Cease.ai	✓	

Fig. 6: Application features used by service providers and business entities



Applications are also available for the general public to report (potential) cases of human trafficking, and stakeholders have the opportunity to educate the general public on human trafficking and the ways of protection with updated resources. Table 4 lists the applications that this study encountered, and Fig. 7 shows the general public's features the most.

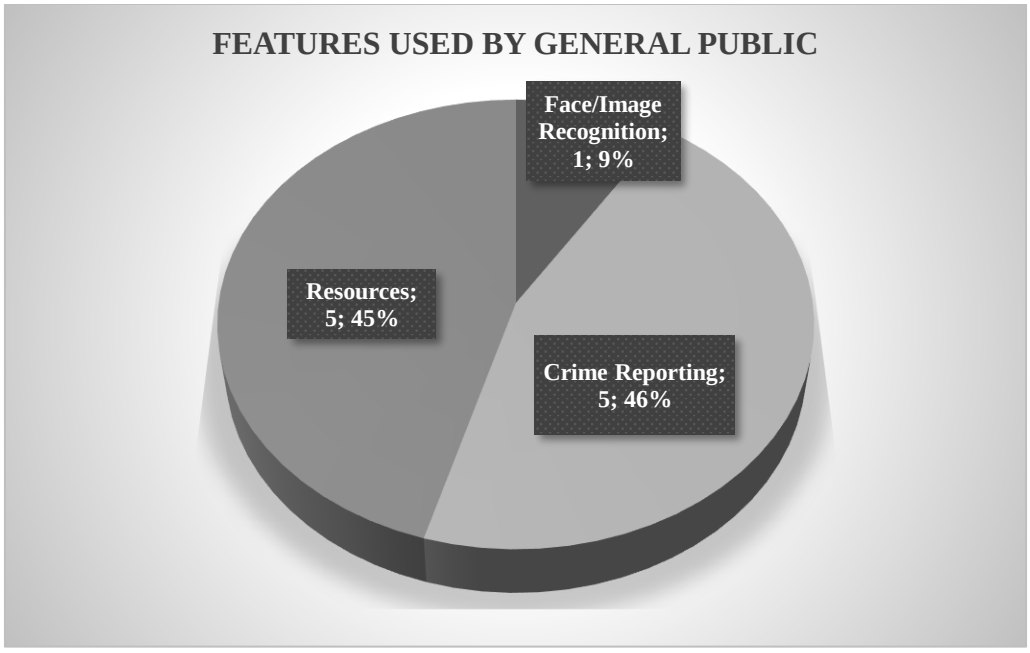
Table 4: List of applications used by the general public

Name of the Application	Type of Application
	Mobile Based

TraffickCam	✓
The Stop App	✓
Redlight Traffick	✓
The lifeboat – Act!	✓
Ban Human Trafficking	✓
Run2Rescue	✓
Freedom!	✓
Kavalan SOS	✓

For the general population, several stakeholders have collaborated to bring out applications that help report an incident of human trafficking, creating awareness on the issue using online story-based educational games — Act! and Ban Human Trafficking applications. With the increase of online exploitation of individuals, especially children, parents are responsible for monitoring the wards of their content and websites. Freedom! application when installed in the electronic devices, parents can block websites and suspicious texts so that the exploitation is reduced significantly.

Fig. 7: Application features used by the general public



Discussion

The law enforcement agencies utilize 18 applications, of which 14 applications are being used to detect child sexual abuse materials in the dark web. Only two applications are used to identify victims and traffickers, and two other applications assist in identifying digital documents, metadata and texts related to human trafficking. All these applications are used more from an investigative standpoint. From the analysis of 38 applications, it is seen that several stakeholders had contributed to combatting human trafficking at different levels and simultaneously provided services.

All applications that the law enforcement agencies use are developed in collaboration with NGOs, academia and tech companies. However, each collaborator contributes to developing and hosting such applications from their base of expertise which is limited either to technology or subject knowledge. Technology-based companies support in the development and hosting of the applications, while academia, NGOs and other civil society organizations contribute through their subject knowledge and experience in victim support services. Five applications — Amobile That, The Safe Car Wash, The Stop App, Redlight Traffick and Kavalan SOS — are predominantly being used by stakeholders, citizens and victims to report incidences of human trafficking to NGOs and the authorities. The other applications identified in this study are being used to create awareness on human trafficking, keep children safe, assist in storing details of victims/survivors, provide victim support services, and serve as helplines.

However, the services provided to the victims and survivors are limited even in an urban setting. From the application studies, Companion Chat and Run2Rescue are the two applications that provide emotional support to the victims and assist girl victims caught in sex trafficking situations, respectively. Although non-investigative applications help in reporting human trafficking incidences and act as helplines, they primarily channel information to the authorities. NGOs who had contributed to the development of applications have assisted in support services for selected cases depending on the need, such as helping survivors build plans so they can safely leave their situations or get the help they need to rebuild their lives, direct them to other local NGOs/half-way homes, or for psychosocial support. All the non-investigative applications provide information on prevention, the do's and don'ts and facts on safety and essential crisis information apart from the mass media campaigns and other awareness initiatives they lead.

Therefore, based on the analysis of applications in this study, it is imperative to devise support mechanisms by local NGOs and other civil service societies to assist the victims and survivors of human trafficking. There must be increased cooperation, coordination, and mutual support between the public and private sectors in combatting human trafficking. The government needs to lead the fight by taking accountability for human trafficking, expanding resources for investigation, protection schemes & infrastructure and sustained prosecution initiatives will boost confidence and facilitate robust partnerships with tech companies, NGOs and civil service society organizations. This study reiterates the echo of the fourth 'P' in the 4Ps of human trafficking — Partnerships — that was added in 2009 to serve as a pathway to progress in the effort against modern-day slavery.

Way Forward

The general public in India is not sensitized to identifying suspicious trafficking activities, both offline and online. Despite several portals being made available for reporting and seeking guidance for victims, there is a stark low level of awareness. In addition, the study found no tools in India that focus exclusively on educating and creating awareness among the general public. Therefore, such devices will be of great help to tackle trafficking in the country.

However, what is lacking in all the new technologies is a predictive approach to tackle human trafficking. The bigger question remains unanswered is how and who will get involved in

trafficking. While software applications help identify potential victims by studying the vulnerabilities for victimization, there is a considerable research gap in identifying individuals with criminal tendencies to commit human trafficking. Moreover, technology must use outlier analysis to identify deviant online activities. A strong foundation for predictive technology can be made with the combination of the two. However, this will require multi-stakeholders such as academia, non-governmental organizations, and law enforcement agencies to build partnerships to design and develop technologies to combat human trafficking.

Role of Educators and Researchers:

Educators and other school-based professionals have a critical role in recognizing potential human trafficking and helping potential victims access specialized services. Educators are trained to look out for potentially dangerous behaviours, changes in behaviour and emotional State, and signs of abuse and neglect, all of which are likely to be present in victims of human trafficking (Polaris, 2011). Educators are in a unique position to identify youths in diverse situations of both sex and labour trafficking (Polaris, 2011) or those who are in the process of being groomed by the trafficker.

Educators and researchers can contribute immensely to the knowledge base of human trafficking. Funded research studies that they lead can significantly boost groups working in anti-human trafficking efforts. Studies to find prevalence; new trends of human trafficking during and post-natural disasters/pandemics; *Modus operandi* of traffickers; trafficker's networks; economy of human trafficking; safe houses and routes used by traffickers; the challenges and opportunities with victims of sex and labour trafficking; initiatives are taken by government agencies and civil society organizations in identifying hotspots; convictions/acquittals in human trafficking cases, etc. would contribute to knowledge that different stakeholders can work on. By disseminating the study findings, they create awareness among their peers and the student community apart from practitioners.

Educators can encourage student communities to explore and develop technological breakthroughs through competitive activities. These technological breakthroughs can help victims and vulnerable groups to reach out for help in human trafficking cases. Educators can also encourage and bring student communities together under the banner of anti-human trafficking clubs (AHTCs) that

would render volunteer work in the local communities and identify potential victims of human trafficking.

Role of Government:

The role of government is vital in framing policies and legal framework and their implementation at the ground level. Different actors within the government hold a piece of this implementation and should be made accountable for lapses.

(a.) Policy Makers

On the one hand, a country's procedures against human trafficking might displace the problem to adjacent states (Cho and Vadlamannati, 2012; Akee et al., 2010). On the other hand, successful combat of trafficking in destination and transit states depends on countermeasures in origin states accountable for most of the former's trafficking inflow (US Department of State, 2002). Therefore, counter-trafficking efforts are often studied with a theoretical framework based on international relations (Schönhöfer, 2017). Out of 193-member nations, 178 nations are signatories to the UN Protocol to Prevent, Suppress and Punish Trafficking in Persons, Especially Women and Children. It is imperative for UN member nations to ratify the Palmero protocol and not just be signatories. Countries should respect the UN protocols on human trafficking and align with other countries should provide their citizens with a safe environment from exploitation through human trafficking. This entails enacting a comprehensive law that addresses the varied dimensions of human trafficking. Australia, France, The Netherlands, the United Kingdom, the United States of America are examples of the government's commitment to combatting human trafficking by bringing in legislation in the past ten years are all steps in the right direction. Canada and India are in the process of passing comprehensive Bills in their respective Parliaments. However, there should be a stronger political will in seeing Bills through to become an Act for practitioners to implement on the ground and other nations to expedite enacting laws to end human trafficking. Policymakers should also consider having appropriate legislation for a well-structured policy assessment and monitoring of trafficking activities and safe migration routes by promoting research studies.

The State and national governments should prioritize institutionalizing training courses in various aspects of human trafficking for all officials involved in anti-human trafficking activities. During this training, representatives from civil society organizations and survivor network groups can inform challenges and possible prescriptions at the field level.

(b.) Law Enforcement Agencies and Judiciary

For rule of law to be an effective deterrent, traffickers must understand that their risk of prosecution and conviction outweighs any potential gain (Taylor, n.d.). At the global arena, INTERPOL trains and equips national law enforcement in identifying tactical deployment in the fields and investigating human trafficking cases aimed at dismantling the criminal networks behind human trafficking. INTERPOL also encourages a cross-sector, coordinated approach that combines strengths and exchanges best practices for maximum results on the ground (INTERPOL, n.d.). Law enforcement officials are the first responders in conducting operations/rescues and surveillance, investigations, and obtaining information from the victims and other sources in any crime. It is the same for cases of human trafficking. Law enforcement plays a critical role in a human trafficking case by granting continued presence to victims (Clawson, Dutch and Cummings, 2006). Therefore, it is necessary for law enforcement officers to be made aware through regular training of the various laws about human trafficking and to have a victim-centred approach. The law enforcement officials should also be equipped and refreshed with all the resources and procedures that would assist them in filing robust investigation final reports in a court of law so that the traffickers and others implicated would be convicted.

The judiciary plays a crucial role in upholding the rights of human trafficking victims and determining the guilt and punishment of perpetrators (Organization for Security and Co-operation in Europe, 2019). Beyond deciding upon the guilt or innocence of alleged perpetrators and sentencing considerations, judges also make vital decisions on interpreting trafficking laws and the evidence required to establish the crime. Their choices also affect victim identification criteria, impact upon assessments of victim credibility and may involve protection steps on behalf of victims. All these decisions are critical to the overall success of anti-trafficking efforts. Depending on the jurisdiction, judges may also guide law enforcement agencies and/or actively participate in the investigation phase (MASHAV, 2014).

Trafficking in human beings is a multifaceted crime, and adjudication in such cases can present several challenges for judges. They include, among others, the need to consider complex human trafficking chains involving diverse criminal groups and multiple victims, unique dynamics between victims and perpetrators, a variety of forms of exploitation to be considered, and evolving domestic and international law and evidentiary issues (Organization for Security and Co-operation

in Europe, 2019). The judicial officers from the trial courts to the Supreme courts should be brought together and trained in their respective judicial academies on the practical application of victim-centred and trauma-informed approaches, the non-punishment principle, abuse of a position of vulnerability, consent of a victim and other challenging and emerging anti-trafficking concepts including the impact of rapid development of technology (Organization for Security and Co-operation in Europe, 2019). Specialized training should also be provided to the prosecutors and the free legal aid officials on the procedures, documentation of evidence, victim interviews and victim rights.

Tech Companies and Business Entities:

While implementing the tools, technology partners must also look into providing awareness about the initiative, training to use the tools and other services necessary to maintain the use of tools. To maintain the trust and confidence among the user groups and serve as an example for other initiatives, it is crucial to monitor and evaluate the use of collected data and ensure it serves the purpose of the developed tool.

In August 2021, Google announced a series of product and policy changes that will allow younger people to stay more private and protected online and others that will limit ad targeting. Weeks after Instagram rolled out increased protections for minors using its app, Google is now doing the same for its suite of services, including Google search, YouTube, YouTube Kids, Google Assistant and others (Perez, 2021). A few days later, Apple also unveiled changes to iPhones designed to catch cases of child sexual abuse, a move that is likely to please parents and the police. iPhones will begin using complex technology to spot images of child sexual abuse, commonly known as child pornography, that users upload to Apple's iCloud storage service. Apple would also let parents turn on a feature that can flag when their children send or receive any nude photos in a text message (Nicas, 2021). TikTok and International Justice Mission (an international NGO) in the Philippines has partnered together to ramp up community awareness and reporting of the trafficking of minors to create child sexual exploitation materials. The #Report2Protect campaign encourages timely reporting of the crime to authorities, using the hotlines from the Philippine National Police - Women and Children Protection Center. The campaign features educational and compelling videos from TikTok creators who have a significant following on the platform. The videos display WCPC's hotline numbers and urge anyone who has information about this trafficking crime happening in their community to report. This campaign encourages the community to report

incidences of online sexual exploitation of children and sends a strong warning to traffickers that there is growing vigilance against this crime (Malig, 2021).

The association of businesses and industries should create regulatory bodies to monitor the supply chain for ethical recruitment, eradicate the exploitation of cheap labour, and promote industry best practices.

Monitoring and Evaluation to Assess Impact:

There is little evidence on whether the actions taken traditionally to prevent trafficking through awareness-raising and alternative livelihoods have effectively reduced the number of people being trafficked. Monitoring and evaluation is primarily concerned with civil society organizations and academia. However, in a collaborative effort, it is necessary to measure the impact of activities that have been implemented in hotspots of human trafficking to get a glimpse of the ground situation. Hence, it is essential to assess the impact of the implemented technological tools against strong indicators on prevention, protection and prosecution of trafficking in human beings.

By this, gaps and other bottlenecks can be taken care of, and the level of participation of the stakeholders can be reviewed if needed. However, neither monitoring nor evaluation is intended for ranking or shaming countries. Instead, the objectives are to help governments effectively combat transnational organized crime and overcome ineffective policy implementation (United Nations Office on Drug and Crime, 2020).

Conclusion

Criminals are the unintended beneficiaries of technology and globalization. We have prospered from our high-speed, high-tech world, but the criminals have been gifted a digital platform on which to develop their illicit businesses (Fedotov, 2017). Traffickers are as diverse as their countries (Kristina and Kseniya, n.d.). Regardless of which end of the ‘sophistication’ spectrum traffickers are operating, and irrespective of where in the world they are committing their crimes, all of them are benefiting in their criminal activities through advances in technology which make it faster, easier, cheaper (and ultimately more profitable) to conduct transactions (UN.GIFT, 2008).

Technology has allowed and aided the spread of human trafficking activities across the globe. Technology that is simple, portable, and leaves little or no trace evidence has been used in

recruiting, exploiting, disseminating or live streaming images and videos by traffickers. Traffickers have primarily used technology for commercial sexual exploitation and in CSAM activities. However, traffickers have now started utilizing technology to recruit and exploit individuals for labour. Traffickers primarily use technology to communicate with potential victims and advertise their 'goods' and potential customers. Traffickers prefer to communicate through wi-fi connections or a mobile phone application rather than a standard mobile phone SIM card that leaves trace evidence for law enforcement to identify them.

They also use technology for financial transactions to recruit individuals fraudulently (with an advance amount seen in labour exploitation) or to receive payments from customers. Bitcoins and money transfer traffickers are increasingly using mobile applications to make payments quick and untraceable.

The nexus between human trafficking and technological advancements has gained importance and has grown and changed over the years. This is evident in the current COVID-19 crisis where traffickers are also 'working from home' to groom children or live stream CSAM to other parts of the world and receive payments through clandestine methods without denting the illicit global economy despite the pandemic. There is also a strong relationship being developed by law enforcement, community partners, and tech companies to identify traffickers and payment channels that support victims and create awareness on human trafficking to the general population. There is still scope to have public-private partnerships to propel technological advancements to protect citizens, especially children, from human trafficking.

Governments have an essential role in expediting the process to frame policies and comprehensive legislations that are victim-centred. Governments should be open to sharing data with other stakeholders, which would open multiple ways of collaborating in rescue, rehabilitation and repatriation, awareness generation, technological advances, etc., and building an accountability mechanism within the system. In the process, the Target 8.7 of the SDGs would most likely be achieved by 2030.

Forging multi-stakeholder partnerships at all levels — international, national and grassroots — are essential in combatting human trafficking. It is crucial to bring together different stakeholders on a knowledge-sharing platform. Such platforms will provide live intelligence from the ground.

Being up-to-date with the changes in the applicable legal frameworks, emerging new forms of exploitation of human trafficking and counter-responses by the traffickers will help position the different stakeholders to take appropriate measures to counter human trafficking, especially in the technology domain. It is noteworthy to note the growing collaborations between government, civil society groups and tech companies to combat human trafficking and exploitation over the internet. It was recently reported that leading technology companies —Discord, MEGA, Pinterest and TikTok would be joining Technology Coalition and other 20 technology partners[5] to develop rigorous, evidence-based approaches to tackle child sexual exploitation and abuse (Technology Coalition, 2021).

What is lacking in all the new technologies is a predictive approach to tackle human trafficking. While software tools help identify potential victims by studying the vulnerabilities for victimization, there is a considerable research gap in identifying individuals with criminal tendencies to commit human trafficking. Moreover, technology must use outlier analysis to identify deviant online activities. A strong foundation for predictive technology can be made with the combination of the two. However, it will require academia, civil society organizations, and law enforcement contributions before designing such a technology.

Active engagement and participation from all stakeholders should be ensured by data sharing to engage in empathetic reasoning to find answers for the right questions and build scalable models that can be implemented to tackle the crime. Public-private sector action can ensure that victims of human trafficking are not left voiceless and don't remain unseen by society (Niethammer, 2020).

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[5]Technology partners include Adobe, Microsoft, Amazon, Facebook, OutSchool, Twitter, Apple, Flickr, PayPal, Verizon, CloudFlare, GoDaddy, ClubHouse, Google, Wattpad, Dropbox, Snap Inc., Yubo, Roblox and VSCO.

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