

# Investigating Human Trafficking Recruitment Online: A Study of Fraudulent Job Offers on Social Media Platforms

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In recent years, human traffickers have increasingly relied on social media to target and recruit victims. However, limited research has been conducted on the recruitment methods for human trafficking on social media, particularly in developing countries. Through in-person and digital observations, interviews, and case analysis, our paper sheds light on the tactics used by traffickers on social media to lure people into trafficking and highlights the characteristics of suspicious job advertisements used for human trafficking recruitment.

Our paper also discusses the investigative techniques employed by anti-trafficking experts to address recruitment and the challenges they face when identifying and investigating fraudulent jobs. Based on these findings, we provide recommendations on how technology can help tackle the problem of recruiting people online, and suggest design implications to improve the safety of social media platforms. Furthermore, we discuss the challenges and ethical considerations in developing anti-trafficking software and provide suggestions for addressing these challenges.

CCS Concepts: • **General and reference** → **Empirical studies**.

Additional Key Words and Phrases: Empirical Methods, Social Networking Site Design and Use, Empirical study that tells us about how people use a system, Ethnography, Qualitative Methods

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## 1 INTRODUCTION

Human trafficking is a global problem that affects millions of people around the world. More than 49 million people are estimated to be affected by this problem, with perpetrators making billions of dollars in profits by exploiting victims through activities such as forced labor and prostitution [9, 32, 50, 60, 108]. Human trafficking is mainly a real-world crime; however, in recent years, human traffickers have increasingly turned to social media platforms as tools to facilitate various forms of exploitation, such as sex work [9, 32, 50, 60, 108].

Human traffickers exploit social media platforms designed for communication, job searches, and social networks [12, 60, 85, 88] to recruit and exploit individuals, leading to dangerous situations [6, 13, 39]. These platforms have features that enable traffickers to easily access potential victims [36]. In 2018, UK authorities discovered 539 pages on social media that promoted travel to Europe, taking advantage of people's desires in developing countries for a better life [20].

Recruitment represents a crucial stage in the human trafficking process; it is the first stage in which traffickers identify and lure victims. Unfortunately, research on the use of social media platforms to recruit victims of human trafficking is limited [47, 53, 59, 74, 79, 98]. Furthermore, most of the research on online recruitment has been conducted primarily in the Global North, particularly in the United States, leaving limited research on this topic in the Global South.

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53 Additional research on online recruitment would be beneficial in developing technical and non-technical solutions to  
54 address this problem, particularly in the Global South. By implementing preventive measures for recruitment, victims  
55 can be prevented from being exploited or subjected to traumatic experiences [107].  
56

57 Anti-trafficking stakeholders, such as non-governmental and law enforcement organizations, work to identify  
58 instances of online human trafficking recruitment. However, there is also limited information on the methods used by  
59 these stakeholders to investigate and identify potential recruitment cases on social media. Obtaining such knowledge  
60 would be beneficial for developing tools to detect instances of human trafficking recruitment online and automate  
61 investigative processes to improve efficiency and scalability.  
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63 Two primary strategies are employed in online recruitment for human trafficking: posting fraudulent job adver-  
64 tisements or establishing fake relationships through grooming [9]. In the initial scenario, human traffickers employ  
65 fake job advertisements to attract potential victims, whereas in the latter scenario, they establish romantic or personal  
66 relationships. The investigation of recruitment through fake relationships presents particular challenges, as the majority  
67 of interactions occur within private chat rooms, and access to such data is frequently restricted. As a result, this paper  
68 focused on fraudulent job advertisements.  
69

70 In this paper, we will examine the online recruitment of victims in the Global South, with a focus on Africa. The  
71 study addresses three main research questions: 1) How do human traffickers use social media to recruit victims through  
72 fraudulent job offers? 2) How do anti-trafficking organizations investigate and respond to fraudulent job offers associated  
73 with human trafficking? 3) What are the typical characteristics of these fraudulent job offers in the context of human  
74 trafficking?  
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76 To address these research questions, we collaborated with an organization focused on identifying and investigating  
77 human trafficking recruitment cases in Africa. This organization operates in multiple countries and prevents people  
78 from being recruited both online and offline. However, efforts to investigate fraudulent job posts for trafficking on  
79 social media are currently limited to one country, which serves as the focus of our research. The team in this country  
80 investigates one social media platform because most of the cases they handle originate there. Due to the organization's  
81 commitment to maintaining anonymity and preserving the integrity of their work, we will not disclose the names of  
82 the social media platform and the country in question. There are concerns that traffickers may alter their tactics on the  
83 platform, hindering the organization's ability to carry out their work effectively. Therefore, we refer to the country as  
84 "Country A", the organization in the focal country as "Organization A", and the platform of focus as "Platform A".  
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86 This paper makes the following contributions: 1) insights into the tactics employed by human traffickers who use  
87 fraudulent job offers as a means of online recruitment and the characteristics of these job advertisements; 2) an empirical  
88 understanding of the methods used by anti-trafficking organizations to investigate human trafficking recruitment  
89 on social media, as well as the challenges they face in their current setup; 3) insights into the challenges and ethical  
90 considerations of developing anti-trafficking software and recommendations to address these challenges; and 4) design  
91 implications for features that can be implemented on social media platforms to help reduce the likelihood of human  
92 trafficking recruitment.  
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94 Following the introduction section, the second section provides an overview of human trafficking and online  
95 recruitment, and the third section details the methodology used to address the research questions. The fourth section  
96 presents the findings and the final section presents a synthesis of the results, including a discussion of the limitations  
97 and future directions of the research.  
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## 2 BACKGROUND AND RELATED WORK

### 2.1 Human Trafficking

The United Nations Protocol on Trafficking in Persons [101], signed by member countries to address modern-day slavery, defines human trafficking as the act of recruiting, transporting, transferring, harboring or receiving individuals using coercion, abduction, fraud, deception, abuse of power or vulnerability, or the provision or receipt of payments or benefits to exploit them for financial gain. Human trafficking victims are exploited for various reasons, such as forced labor and prostitution, or other forms of sexual exploitation. Human trafficking in Africa is characterized by several factors, such as ineffective government leadership, political instability, economic challenges, and limited government capacity to combat trafficking effectively [37, 38, 44, 100].

Human trafficking typically involves three stages: recruitment, transportation, and exploitation. In the initial recruitment stage, traffickers employ various tactics to target vulnerable individuals, such as coercion, force, or fraud [71]. The transportation phase of human trafficking typically involves the movement of individuals between locations using various means of transportation, including land, sea, and air. However, it is important to note that human trafficking can occur without a transportation phase [104]. The final stage of human trafficking is the exploitation phase, in which victims are forced to engage in involuntary activities such as forced prostitution [71].

The digital age has led to innovative methods of conducting human trafficking, characterized by a shift from traditional physical interactions to dynamic online environments [36, 53, 74, 108]. This form of trafficking that occurs online is also known as internet-based trafficking, online trafficking, or technology-facilitated trafficking. Most of the research on online human trafficking has focused primarily on identifying patterns, keywords, and indicators related to how human traffickers advertise victims during the exploitation stage after they have been recruited [33, 49, 52, 60, 61, 113]. This body of work has left a significant gap in our understanding of online recruitment, which is the main focus of this paper. Previous research has emphasized the need for more studies on how traffickers use social media sites to target and recruit victims, including fraudulent job opportunities [47, 53, 59]. This knowledge will assist stakeholders such as law enforcement and anti-trafficking organizations in developing measures to address this crime [53, 74, 98].

The following section discusses related work on online recruitment. The literature in the following section mainly discusses previous work from the Global North because most of the work has been done in this region, as previously mentioned.

### 2.2 Human Trafficking Recruitment on Online Platforms

In recent years, human traffickers have increasingly turned to online platforms for victim recruitment, making it one of the main methods used [30, 36, 39, 53, 74, 108]. The digital environment presents benefits to human traffickers, including the ability to reach victims in distant locations and the reduced probability of being detected by authorities [32, 60, 79, 108].

Victims are frequently recruited through the internet by unknown individuals who conceal their true identities [13]. It has been reported [117] that there are a substantial number of fake profiles on social media, allowing traffickers to anonymously search for victims through these profiles [13]. In addition, traffickers employ various techniques to maintain anonymity, such as concealing their IP addresses, which poses a challenge to law enforcement and other stakeholders in identifying them, particularly their actual location [13, 103].

Traffickers use two primary strategies to recruit people online. The first approach involves traffickers targeting specific victims, typically on social media platforms, through messages that often begin as friendly, but quickly escalate

157 to aggression as the relationship progresses [103]. On the other hand, the second strategy involves victims reaching out  
158 to traffickers in response to deceptive information posted online by traffickers [79, 103]. These victims are generally  
159 randomly selected based on those who react to this misleading online information, such as when fraudulent job  
160 advertisements are posted.  
161

162 **2.2.1 Fraudulent Job Advertisements.** Traffickers use a variety of platforms, including social media marketplaces,  
163 reputable websites, and custom-built websites to lure people into trafficking situations through fraudulent job opportu-  
164 nities [79, 98, 103]. However, social media platforms are the preferred avenue for criminals to disseminate false job  
165 offers [39, 79, 94].  
166

167 Fraudulent job advertisements often use attractive language to entice potential victims, promising better lifestyles [103].  
168 Upon responding to these deceptive offers, individuals are subsequently exploited by traffickers who arrange their  
169 transportation. One such example is a case in which criminals established fake profiles on social media and advertised  
170 employment opportunities on various pages they created. They successfully recruited 100 young women through these  
171 pages and forced them to send compromised images [102]. It is common practice for traffickers to exercise control over  
172 their victims after they have been recruited and before they are transported [9, 79].  
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174 Volodko, Cockbain and Kleinberg [107] used indicators applied to identify labor trafficking in the real world to identify  
175 suspicious job advertisements on a Lithuanian website. However, it is necessary to develop indicators specifically for  
176 online fraudulent job advertisements for human trafficking rather than relying on indicators from the offline world [21].  
177 Studies have concentrated on offline recruitment techniques and indicators, and only a few have examined online  
178 recruitment and its indicators, although it is a prevalent form of recruitment [39, 79, 103].  
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180 To develop effective indicators to detect fraudulent job advertisements on online recruitment platforms, it is crucial  
181 to gain a deeper understanding of the tactics employed by traffickers to create job postings to lure victims. Several  
182 studies have emphasized the need to investigate online recruitment, particularly how traffickers target and entice  
183 victims on social media platforms [47, 53, 59, 98]. Insufficient emphasis on online recruitment has resulted in ineffective  
184 strategies to address this problem ([79, 118]). Understanding online recruitment will lead to more effective solutions to  
185 address this problem.  
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### 189 **2.3 Anti-trafficking Policies and Online Legislations**

190 Due to the numerous threats on social media platforms, various laws have been enacted to combat the abuse of  
191 these platforms and help protect individuals from crimes such as human trafficking. Most laws specifically for human  
192 trafficking usually target sex trafficking, because it is the most common form of human trafficking conducted online.  
193 These laws are summarized in Table 1.  
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Policy	Impact on Anti-Trafficking Work
The Communications Decency Act (The US)	This act conferred immunity to online platforms regarding user-generated content, resulting in platforms hosting advertisements that promote human trafficking victims to potential clients without significant concerns for legal accountability [25].
The Stop Advertising Victims of Exploitation (The US)	Online platforms were held liable for user-generated content; however, this liability was removed if platforms attempted to moderate such content in any capacity, thereby introducing potential legal loopholes.
The Fight Online Sex Trafficking Act and Stop Enabling Sex Traffickers Act (The US)	Online platforms are held accountable for any sex trafficking content generated by users [25, 40, 83]. Online platforms demonstrated increased proactivity in removing suspected accounts; however, legitimate sex workers were inadvertently affected by these removals.
The Digital Service Act (The EU)	Necessitates online platforms to remove content about human trafficking identified by users or relevant stakeholders, such as law enforcement agencies, thereby prompting action against illicit material.
The Online Safety Bill (The UK)	It requires that platforms monitor content and remove any illicit material, such as identified human trafficking content, and implement measures to prevent access to such content while considering user privacy [46].
The Online Safety Act (Australia)	Mandates online platforms to assume responsibility for user safety by proactively safeguarding against access to illegal content, thereby compelling platforms to remove content associated with human trafficking [3, 72]
The Computer Misuse and Cybercrimes Act No. 5 (Kenya)	It facilitates the prevention, prosecution, detection, investigation, and punishment of cybercrime, thereby contributing to the mitigation of online human trafficking [69].
The Films and Publications Act (South Africa )	Statutory obligation for online content distributors and Internet Service Providers to safeguard the general public, with particular emphasis on minors, from content pertaining to human trafficking [43].
The Child Online Safety and Empowerment Policy (Africa)	This policy aims to protect children from online risks like human trafficking and to assist African nations in implementing legislation that seeks to ensure children's online safety [1, 4, 70].

Table 1. Anti-trafficking Policies and Online Legislations

The Communications Decency Act of 1996 drew criticism for facilitating human trafficking advertisements online because of the immunity afforded to Internet Service Providers (ISPs) and online platforms [25]. In response, the US introduced the SAVE Act in 2015, which held platforms responsible for trafficking content but with significant loopholes. To address these loopholes, the FOSTA-SESTA package was enacted in 2018, which amended the CDA to hold platforms responsible for sex trafficking content created by users [25, 40, 83].

In Europe, the Digital Service Act requires that online platforms in the EU address illegal content without monitoring user content, but by removing flagged content and using transparent automated moderation tools [35, 78]. However, the UK's Online Safety Bill and the Australia Online Safety Act of 2021 require platforms to ensure user safety by proactively monitoring and removing illegal content while considering user privacy [3, 46, 72]. All three regulations impose significant penalties for non-compliance.

In Africa, Kenya implemented the Computer Misuse and Cybercrimes Act No. 5 of 2018 [69] to help prevent, prosecute, detect, investigate, and punish cybercrimes. The Act also mandates the protection of accountability, integrity, and availability of computer systems, programs, and data. South Africa introduced the Films and Publications Act in 1996 and amended it in 2022 [43]. This Act aims to ensure online safety by mitigating online harms, including provisions that require online distributors and ISPs to protect the general public from explicit and harmful content.

In 2024, the African Union Ministry introduced the world's first policy framework for the implementation of children's rights in the digital space: the Child Online Safety and Empowerment Policy [1, 4, 70]. This policy aims to protect children from harms online and offline, which have become increasingly prevalent. This policy assesses the benefits and threats of digital platforms for children in Africa and identifies key issues and policy goals [1, 4, 70]. In addition, this policy aims to help African countries implement legislation that aims to protect children's safety online.

Despite various initiatives, efforts to combat cyber threats and ensure the safety of individuals online in Africa are disproportionately low compared to other continents [97]. Only a few countries have laws that address online harm, such as cyberbullying and human trafficking. As countries in Africa aim to establish legislation for digital platforms, policymakers would benefit from having access to more information on the role of the Internet in facilitating human trafficking in Africa to develop the necessary measures to address this issue.

### 3 METHODOLOGY

Due to the complex nature of human trafficking, investigating the topic necessitates direct engagement with anti-trafficking stakeholders to obtain meaningful insights. We devised a multifaceted research approach involving a combination of digital and in-person observations, interviews, and case study analyses (See Figure 1).

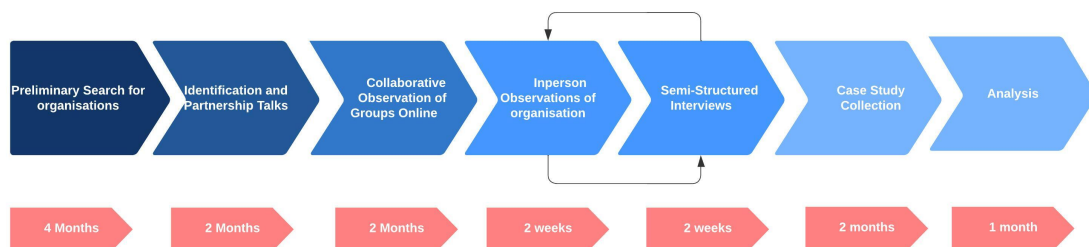


Fig. 1. Overview of the methodology process, from data collection to analysis

Each research method addressed at least one of the three research questions. The first research question regarding the methods traffickers use to recruit victims was primarily addressed through online observation of Platform A, focusing on the operational patterns of suspicious accounts and interviews to obtain clarification of these observed methods. The second research question regarding how anti-trafficking organizations investigate and respond to fraudulent jobs

313 was primarily addressed through in-person observations and interviews. The final research question concerning the  
314 characteristics of fraudulent jobs was addressed using all methods, which included monitoring job advertisements on  
315 Platform A, conducting a case study analysis, interviewing staff members and observing their process of monitoring and  
316 shortlisting suspicious advertisements. Incorporating in-person and online observations provides a more comprehensive  
317 approach to understanding research problems [68], which was one of the main reasons for including both methods to  
318 study the characteristics of fraudulent job advertisements.  
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320 The limited existing research in this area and the scarcity of publicly available datasets from anti-trafficking  
321 organizations make other data collection methods less feasible. In addition, obtaining data from social media platforms  
322 poses significant challenges, particularly for research on sensitive topics such as human trafficking. The following  
323 section outlines the process of identifying and establishing a partnership with Organization A.  
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### 326 3.1 Organization Identification

327 This research established collaboration with Organization A through the following steps:  
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- 329 (1) Search engine queries with keywords such as 'human trafficking organization Africa' and 'human trafficking  
330 recruitment Africa' led to the identification of Organization A's website among the search results  
331
- 332 (2) Initial contact was made through an online form on their website, outlining the primary researcher's background,  
333 the research aims, and the need to obtain permission.  
334
- 335 (3) Organization A's administrator connected the research team with the head of data science, and initial meetings  
336 were held to gain a deeper understanding of Organization A's work.  
337
- 338 (4) The final steps involved obtaining ethical approval and simultaneously signing contractual agreements between  
339 Organization A and the research team's university, outlining how any shared data would be managed. Once  
340 these agreements were signed, the collaboration with Organization A began. Additional details about the ethical  
341 approval process are described in the following section.  
342

### 343 3.2 Ethical Considerations

344 Ethical approval was obtained from the researchers' institution before starting the research. For online observations,  
345 a commitment was made to refrain from engaging with the participants. The ethical approval process clarified that  
346 deception would not be employed in research activities. During the study, participants' privacy and confidentiality  
347 were safeguarded by anonymizing all personal identification information from both online and in-person observations.  
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### 351 3.3 Participant and Platform Background

352 *3.3.1 Organization A and Research Participants.* Organization A is a local non-profit initiative that aims to prevent the  
353 recruitment of individuals into human trafficking in Country A. Organization A operates in a single city and maintains  
354 a physical office where its operations are headquartered. This initiative employs a multifaceted approach that seeks to  
355 educate potential victims about the dangers of human trafficking and prevent them from pursuing risky opportunities.  
356 Organization A investigates whether job advertisements on Platform A are related to human trafficking and prevents  
357 potential victims from pursuing these opportunities.  
358

359 Organization A is made up of a diverse group, including the project manager, the director, the data analysts, and the  
360 investigators. The investigators and project manager play a central role, responsible for identifying potential cases of  
361 human trafficking on Platform A by analyzing fraudulent job opportunities. The lead researcher collaborated with five  
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365 investigators, each with eight months to two years of experience, the project manager with seven years of experience,  
366 and the director with five years of experience.  
367

368 **3.3.2 Platform A.** Platform A is a popular social media platform in Country A, with millions of users. It enables users  
369 to create profiles and connect with one another as well as establish online communities. Platform A offers various  
370 features, such as groups tailored to individuals with shared interests. This paper focuses primarily on job opportunity  
371 groups for Country A on this platform. Organization A centers its work on Platform A because of the significant  
372 number of suspicious job posts in the groups, the simplicity of conducting investigations, and the availability of relevant  
373 information, such as victim and trafficker contact details. Previous research has also linked Platform A to facilitating  
374 human trafficking in multiple countries [9, 32, 39, 60, 79, 103].  
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377 Job advertisement groups on Platform A vary in size from several hundreds to hundreds of thousands of members and  
378 have no membership prerequisites, rendering them accessible to individuals from diverse age groups and backgrounds.  
379 These groups can be categorized as public or private. Accessing private groups requires only an account on Platform A  
380 and a membership request. These groups allow for unrestricted posting and commenting by members.  
381

382 The job advertisements analyzed in this study focused exclusively on the job advertisements groups associated with  
383 Country A. These groups predominantly included the names of the country or cities in their titles. In some cases, group  
384 names also included unique attributes specific to Country A, such as the name of the national high school certification.  
385 These groups are primarily targeted at residents of Country A, but can also be accessed by non-residents due to the  
386 ease of joining.  
387

388 The job advertisements posted in the groups cover a wide range of occupational roles. The frequently advertised  
389 positions in these groups were that of domestic workers, housekeepers, security guards, and cleaners. These job  
390 advertisements are typically placed on behalf of companies or for personal reasons such as seeking assistance with  
391 household duties. Most job advertisement posts provide a description of the job in the post, while others include pictures  
392 with a job description or provide links to an external source containing further information about the job.  
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395 Job advertisements analyzed during this research met the following criteria:

- 396 (1) Job advertisements posted within one month of the review date. This timeframe facilitates timely intervention  
397 by Organization A.
- 398 (2) Job advertisements containing a company name and contact information. These details are essential for  
399 Organization A's investigations, with the rationale explained in more detail in the findings section.  
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#### 402 **3.4 Online observation: Social Media Groups**

403 We conducted an online observational study of 14 social media groups on Platform A over a two-month period, averaging  
404 12 hours of active engagement per day. These groups were identified and provided by Organization A because they  
405 have been found to disseminate content related to human trafficking. The size of these groups ranged from 1500 to  
406 143,000 members.  
407

408 Before starting the data collection process, the researcher received training in identifying the indicators of fraudulent  
409 job advertisements related to human trafficking. Examples of such indicators include job advertisements that feature  
410 attractive salary packages and language patterns. Additional details on indicators that can help identify fraudulent jobs  
411 for human trafficking can be found in Section 4.3. The primary researcher carried out a manual review of job postings  
412 and their accompanying comments in chronological order in the 14 groups.  
413  
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417 The primary researcher adopted a passive observer role, that is, they observed group activities without interacting  
418 with participants who were unaware of being monitored [116]. Suspicious posts were saved in a private group on  
419 Platform A and forwarded to Organization A for further investigation. In total, 40 suspicious posts were reported to the  
420 project manager.  
421

### 423 3.5 In-person Observations and Semi-structured Interviews

424 In-person observations were conducted by the primary researcher in Country A over an eight-day period within two  
425 weeks, with a daily commitment of four hours. The research participants were selected through purposive sampling,  
426 coordinated with the project manager. These observations followed an unstructured approach that involved direct  
427 interaction with the participants throughout this time.  
428

429 During the observation period, notes were taken to record daily events and significant findings. The discussions  
430 with the participants were also recorded using audio devices during the observation sessions, and photographs of the  
431 environment and job advertisements were taken for the benefit of the broader research team.  
432

433 During these in-person observations, semi-structured interviews [14] were conducted to supplement the information  
434 collected from the direct observations. These interviews, which lasted approximately 30 minutes on average, were  
435 designed to elicit the rationale behind the actions taken by investigators and managers and to clarify any observations  
436 made. The interviewees included the project manager, three investigators, and the organization's director, who were  
437 selected for their expertise and availability.  
438

### 441 3.6 Case Notes Analysis

442 Organization A maintains a comprehensive database of all verified cases of human trafficking involving job adver-  
443 tisements. Each record in the database contains detailed information about the job advertisement, the investigation  
444 process, and indicators of human trafficking, as well as relevant information about potential victims, traffickers, and  
445 screenshots of the job advertisement. Organization A provided researchers with access to cases for four months, and 15  
446 cases associated with Platform A were analyzed to gain a deeper understanding and validate the insights gained during  
447 the observation period.  
448

### 451 3.7 Analysis

452 Data collected from audio recordings of observations and interviews were transcribed and entered into NVivo 12 for  
453 analysis. The lead researcher then used an inductive approach to develop codes by carefully examining observational  
454 notes from the ethnographic study, case notes, and transcripts from observations and interviews. The analysis produced  
455 a set of codes that were then developed into a codebook. The coding process focused on uncovering the investigative  
456 methods used by Organization A, recognizing patterns in suspicious job postings, understanding the tactics employed  
457 by traffickers on the platforms, and identifying any indicators that could help identify fraudulent job offers. NVivo 12  
458 Pro was employed to code and draw patterns and conclusions from the data.  
459

## 463 4 FINDINGS

464 This section summarizes the research findings, with the first subsection addressing results related to the first research  
465 question, the second subsection covering the second question, and the final subsection discussing findings related to  
466 the third research question.  
467

#### 4.1 Methods traffickers use to recruit victims on social media

Human traffickers predominantly use two primary methods to recruit victims from these groups. The first involves the dissemination of fraudulent employment advertisements designed to elicit contact with potential victims. Victims typically respond by commenting on advertisements, providing contact information, or expressing their interest. Upon a victim's indication of interest, traffickers initiate follow-up communication through private messages or messaging applications such as WhatsApp. These employment advertisements often generate rapid and substantial responses, with some receiving more than 200 comments in a few minutes. Many advertisements contain indicators of human trafficking.

In the second strategy, human traffickers monitor the content posted by potential victims within these groups to identify them. These posts often reflect individuals' job-seeking intentions, ranging from casual job inquiries to desperate pleas. Most of these urgent appeals come from people who have been unemployed and looking for work for an extended period. Traffickers exploit this by sharing their contact details, typically WhatsApp numbers, or by instructing people to initiate direct communication on the platform. In some cases, potential victims include their own contact information in their posts, enabling traffickers to reach them easily. Individuals in these groups were observed to frequently publicly disclose their contact details.

These groups also attract individuals who promote financial schemes that promise quick and easy gains, often resulting in financial losses for potential victims. Many of these schemes resemble advertisements related to human trafficking, making it difficult to distinguish between the two.

#### 4.2 Overview of Organization's Workflow to Tackling Human Trafficking Recruitment

Figure 6 outlines the four main stages that Organization A employs to identify suspected instances of human trafficking and protect individuals from becoming victims of human trafficking. The initial stage involves monitoring groups on Platform A and selecting advertisements based on specific indicators. After the advertisements have been selected, Organization A conducts a thorough investigation to determine whether they are related to human trafficking. If sufficient evidence is found, Organization A takes the appropriate action by informing potential victims of the dangers of the job opportunity and discouraging them from proceeding. The following sections provide more details of these four steps.

**4.2.1 Monitoring and Shortlisting advertisements.** The monitoring stage involves examining social media groups to identify job advertisements potentially linked to human trafficking. Investigators review postings from a predetermined list of 14 groups discussed in the Methodology section, as well as other job advertisement groups within the country on Platform A. They occasionally use keyword searches to uncover suspicious job advertisements and then monitor related groups or pages. These methods are performed manually, without technological assistance.

Drawing on past experience, Organization A developed a set of indicators to identify fraudulent job advertisements in Country A. Investigators use these indicators to shortlist suspicious advertisements, relying not on a single criterion, but rather on a combination of various indicators to guide their selections. After identifying suspicious job advertisements, they employ various investigative processes to assess whether these advertisements are linked to human trafficking. These processes are discussed in the following section.

**4.2.2 Investigation process.** Investigators typically operate individually when analyzing cases, but they occasionally seek advice from their colleagues when aspects of a case are ambiguous. They frequently consult with the project

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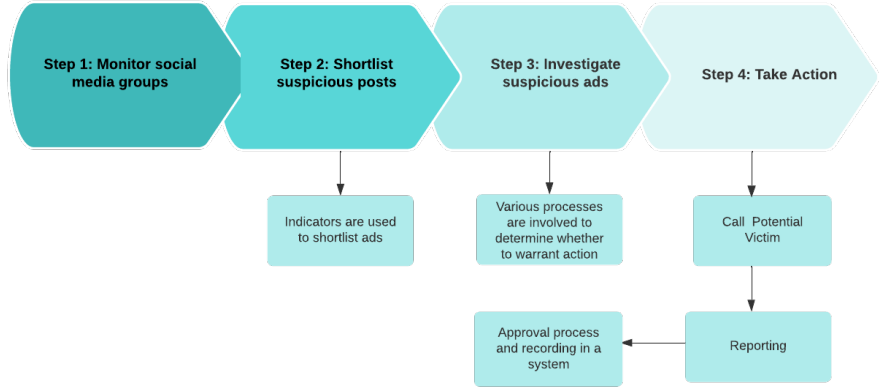


Fig. 2. Overview of Organization A’s workflow

manager because of his extensive experience in the field. The investigation procedure for each case can vary, but typically includes the following steps:

- (1) **Investigate the company** - Confirming the legitimacy of a company listed in a potentially fraudulent job advertisement is a crucial first step. This process entails cross-referencing the company’s information with a public online database containing records of registered companies, including their contact details, locations, and key personnel. Organization A can verify the authenticity of the company by cross-referencing the information in the job advertisement with data stored in the online database. Should the enquiry uncover that the company is non-existent or has ceased operations, an additional investigation becomes necessary. However, if the company is confirmed to be legitimate, the subsequent step involves comparing its details with those presented in the job advertisement. Any discrepancies or inconsistencies between the two raise suspicions of human trafficking. In some cases, Organization A contacts the company to verify whether they were the source of the job advertisement. The absence of a company name impedes Organization A’s capacity to conduct comprehensive investigations as it constrains the contextual information necessary to establish a definitive link between job posting and human trafficking.
- (2) **Investigate the phone number of the suspected trafficker** - Organization A employs an application to verify the validity of the telephone number associated with the suspected trafficker. This application provides information regarding the individuals connected to the phone number, including their name, registration status, and whether the number is spam. This application is publicly accessible and can be used by any individual. If there is a disparity between the name associated with the phone number and the information provided in the job advertisement, it raises suspicions about the legitimacy of the job post.
- (3) **Investigate the role and packages offered** - Organization A scrutinises the offers of each job posting to validate its authenticity. By using multiple resources to ascertain the typical compensation package for the advertised position, Organization A can determine if the suggested remuneration is in line with current industry norms. The Project Manager states: *"One of the things that we encourage staff is to understand what is going on in the country and understand the different industries and the packages, the requirements and stuff"*

- 573 (4) **Call the suspected trafficker** - Organization A contacts the suspected traffickers using the phone numbers  
574 provided in the advertisement and poses as a prospective candidate to gather information from them. During  
575 these conversations, they carefully observe any indications of deceptive behaviour, falsehoods, or exaggerated  
576 claims made by suspected traffickers. Investigators commonly pose deceptive inquiries to assess suspected  
577 traffickers' credibility, for instance, whether the absence of work records or an unlawful presence in the country  
578 impairs their capacity to pursue the opportunity. During the observation period, the researcher noted that  
579 each of the suspected traffickers contacted claimed that it would pose no problem if the investigators lacked  
580 legal authority to work in the country. On occasion, when suspected traffickers fail to provide their contact  
581 details in the job advertisement, the investigators leave a comment showing interest in the job on the post  
582 to facilitate communication. Typically, traffickers respond using messaging applications such as WhatsApp,  
583 allowing Organization A to obtain their phone number.
- 584 (5) **Call potential victims** - Organization A seeks to gain more information by reaching out to potential victims  
585 and inquiring about any additional details they may possess about the job. Occasionally, this dialogue leads  
586 to victims sharing additional information, including the precise specifics outlined in interview invitations  
587 concerning time and location.

592 Organization A also employs these investigation techniques when potential victims reach out to verify opportunities.  
593 During awareness campaigns, they disseminate their contact details, encouraging people to verify the legitimacy of any  
594 opportunities they come across.

596 4.2.3 **Taking Action and Reporting.** Upon gathering a substantial amount of suspicion suggesting that the job may  
597 be fraudulent, Organization A takes a series of actions.

- 599 (1) **Contact the potential victim** - To begin, investigators typically initiate communication with potential victims  
600 through telephone calls, during which they convey their suspicions about the job opportunity and provide  
601 explanations for their concerns. In addition, they advise against further involvement with the advertised job.  
602 Organization A does not engage in any further communication with the victim following this call. It is left to  
603 the victim to decide whether to continue with the opportunity.
- 604 (2) **Write up the case** - The investigators carefully record all pertinent information related to the case, including  
605 the job advertisement, any interactions with the suspected trafficker, and any indicators that suggest human  
606 trafficking. This comprehensive case report is essential for future evaluation and authorization. At this point,  
607 the case is considered "high risk of human trafficking".
- 608 (3) **Approval process** - Following the completion of the writing stage, a data analyst verifies that the investigators  
609 have all the required case-related information before uploading them to a software platform. Once the case has  
610 been uploaded to the system, two senior personnel, one of whom is the project manager, conduct independent  
611 reviews of all relevant case information. Based on their assessment of the case, the two senior staff members  
612 each provide an individual recommendation on whether it should be classified as having 'sufficient evidence of  
613 human trafficking' or simply as a 'high risk of human trafficking'.  
614 When the two staff members do not reach a unanimous decision in their case assessment, a third senior staff  
615 member is consulted to make a final judgment. In most cases, disagreements between the two members revolve  
616 around whether the case should be classified as high-risk or as having sufficient evidence of human trafficking.  
617 If deemed to have sufficient evidence, the case is officially documented as 'evidence of human trafficking';  
618 otherwise, further investigation is required.

- 625 (4) **Record storage and access** - Following the approval of a case, it is no longer possible to make any changes to  
 626 it. As a result, the case is recorded and archived on a digital platform used by Organization A to monitor and  
 627 manage all cases it handles.  
 628

629 4.2.4 *Challenges to investigating suspicious Advertisements.* Organization A faces several obstacles when conducting  
 630 investigations. The main challenges are lack of collaboration with external entities and scalability.  
 631  
 632

633 *Collaboration* -. There is limited collaboration between organizations and law enforcement in the country. Organiza-  
 634 tion A works independently to prevent victims from being recruited, which hinders their ability to detain traffickers.  
 635 Combating human trafficking requires collaboration between various stakeholders [28]. Organization A also confirmed  
 636 that most anti-trafficking organizations in Country A face difficulties in working with various government agencies. This  
 637 lack of collaboration between Organization A, law enforcement, and government has potential negative consequences  
 638 for both staff and potential victims. For staff, working independently can be dangerous and can limit their access to  
 639 information that could benefit their work. For potential victims, human traffickers can persist in their activities and  
 640 continue to exploit new victims, thus perpetuating the cycle of human trafficking.  
 641  
 642

643 The director of Organization A, who oversees anti-trafficking efforts in 15 other countries in Sub-Saharan Africa,  
 644 discusses two main reasons for the lack of collaboration in some countries compared to others with successful collabora-  
 645 tions. Firstly, there are varying degrees of willingness among governments to work with anti-trafficking organizations.  
 646 The Director states:  
 647

648 "It's so different in different countries; I feel like in some countries there is a real will to work with  
 649 NGOs. You know, to provide extra resources in that way and some governments, I think, appreciate  
 650 having extra expertise and like having eyes and ears on the ground specifically dedicated to combating  
 651 human trafficking, which is such a niche crime. Often, it is not something that their law enforcement has  
 652 the capacity to work on or the depth of understanding, I suppose, about human trafficking." (Director)  
 653  
 654

655 Smaller countries tend to work more with NGOs because it impacts their aid relationships with countries like the US,  
 656 unlike bigger countries such as Country A. The Director further states that "*Smaller countries can really make quick*  
 657 *wins in a way if they allow NGOs or they work with civil society, or if they just have the base levels of what they need to*  
 658 *do, they can really move up that tier system quite easily*". Governments draw on international frameworks such as the  
 659 Palermo Protocol and the Trafficking Victims Protection Act (TVPA). The United States Department of State evaluates  
 660 countries based on their adherence to the minimum standards set forth in the TVPA, assigning scores that indicate  
 661 the effectiveness of government efforts in tackling human trafficking [17, 105]. These evaluations affect countries'  
 662 eligibility to receive funding from the United States. The second reason for the lack of collaboration is that the state of  
 663 anti-trafficking laws in the different countries affects whether they collaborate with other organizations. Most of these  
 664 countries do not comply with international best practices that promote collaboration to combat human trafficking.  
 665  
 666

667 Previous research [73] confirms the lack of collaboration between governments and anti-trafficking organizations  
 668 in Africa, attributed to various country-specific factors. Onuoha [73] highlights several aspects that raise concerns  
 669 about the way African governments operate when fighting human trafficking, which could contribute to the lack of  
 670 partnership. African leaders often prioritize their interests over the allocation of resources and efforts to tackle human  
 671 trafficking, with a greater concern for electoral politics. Furthermore, Onuoha [73] stated that corruption within law  
 672 enforcement agencies also leads traffickers to evade justice. These issues highlight the much larger structural problems  
 673 that affect successful collaborations.  
 674  
 675  
 676

Furthermore, in most African countries, government anti-trafficking strategies primarily emphasize prosecution, focusing on investigating cases, locating and rescuing victims, and apprehending traffickers, rather than on prevention [17]. In contrast, most anti-trafficking organizations, including Organization A, adopt a victim-centered approach that aims to prevent trafficking, identify victims, and provide assistance after rescue. This difference in objectives among anti-trafficking stakeholders can hinder effective collaboration.

*Scalability* - . Organization A has limited financial and non-financial resources. The project manager stated that their mission is to make a significant impact with few resources. The manual method for identifying and investigating advertisements, combined with limited resources, presents a challenge in addressing the substantial number of fraudulent job posts. As a result, many fraudulent posts remain unattended, preventing Organization A from keeping up with the growing number of online recruitment schemes. Online recruitment has become popular because traffickers can target many more people than they would in the real world, thus expanding their criminal enterprise [36]. Organization A expressed concern that most of the employment opportunities reviewed within these groups are fraudulent.

In addition, many positions are not evaluated due to the criteria used by Organization A in their examination process. They have a policy to evaluate job advertisements only if they include contact information for both the trafficker and at least one potential victim. This leads to many suspicious job postings not being investigated. A call to the trafficker is a crucial aspect of the investigation, and their ability to intervene is limited to preventing the individual from pursuing the opportunity, as Organization A does not collaborate with law enforcement agencies. Contact information is obtained from the job advertisement and the corresponding comments section. However, traffickers and victims do not always openly share their contact information, often relying on private messaging instead.

### 4.3 Identifying Suspicious Job Advertisements

The following sections describe the characteristics of job advertisements used to determine their potential for human trafficking. The educational background and experiences of the victims can sometimes hinder their ability to recognize certain indicators outlined in this section.

To maintain anonymity, the images of the job advertisements were modified by removing timestamps and other identifying graphics using cropping tools. These indicators are grouped into five main themes that highlight the characteristics of suspicious advertisements. Table 2 presents an overview of the themes and their associated indicators.

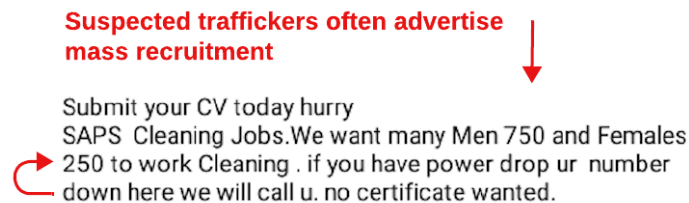
Theme	Indicators
Attract Wide Audiences	Company Names
	Recruitment Volume
	Multiple Roles
	Preferences
Use of Informal Writing	Writing Styles
	Emojis
	Suspicious Links
Offer Attractive Packages	Salary
	Incentives
Use of Known Trafficking Details	Similar Job Advertisement Details
	Trafficking Locations
Request for Personal Information	Personal Details

Table 2. Themes and Indicators

729 **4.3.1 Attract Wide Audiences.** Suspicious job advertisements often employ a strategy of casting a wide net to draw  
 730 in many candidates, thus enhancing their chances of successful recruitment. This is typically achieved by using four  
 731 main methods: the use of *well-known company names*, the advertisement of *multiple roles and mass recruitment*, and the  
 732 inclusion of *specific preferences*.  
 733

734 *Company Names* - A job advertisement found on Platform A's groups raises concern when it includes a role from a  
 735 *reputable company*. Established entities typically use more formal recruitment channels than social media. Traffickers  
 736 who are suspected of using such channels often select well-known companies, particularly those in the food industry.  
 737 Organization A has observed and confirmed on multiple occasions that recognized companies rarely resort to Platform  
 738 A for their hiring needs. Dhaliwa [31] has also stated that legitimate companies do not use social media platforms  
 739 known to connect people for personal reasons to advertise job opportunities.  
 740  
 741

742 *Recruitment Volume* - Human traffickers commonly publish job advertisements that claim to recruit *substantial*  
 743 *numbers* of individuals, sometimes even hundreds. This trend raises suspicions about scam activities, as it is rare for  
 744 companies to recruit a large number of candidates in a single post or all at once. For example, Figure 3 illustrates a  
 745 typical job advertisement that recruits many people. In particular, the format of these posts differs significantly from  
 746 the formal style typically employed by legitimate companies in their recruitment efforts. A potential individual was  
 747 on the verge of falling victim to a similar offer before Organization A intervened to prevent them from accepting the  
 748 opportunity.  
 749  
 750  
 751  
 752

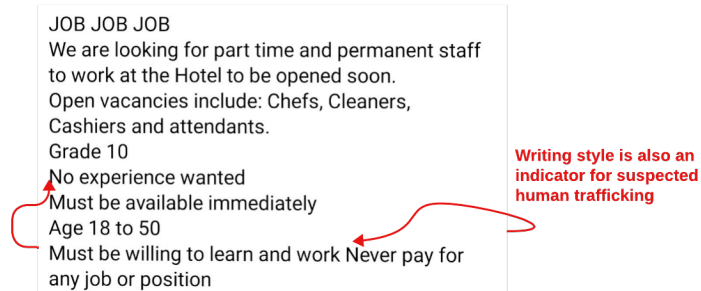


763 Fig. 3. Indicator showing mass recruitment  
 764  
 765

766 *Multiple Roles* - Suspicious job posts frequently advertise multiple roles within a single listing, which can appeal to  
 767 a wide range of applicants by offering a variety of employment opportunities. These advertisements warrant scrutiny,  
 768 especially when they list more than three positions, as they often depart from the standard format of legitimate job  
 769 posts. Additionally, the roles advertised are typically those that pose a high risk of human trafficking. Examples of the  
 770 roles are security guards, general workers, cleaners, and cashiers.  
 771

772 *Preferences* - Job advertisements that express *specific preferences*, such as demographics, should be viewed with  
 773 caution, as they can be exploited by traffickers to expand their reach and target vulnerable individuals. For example,  
 774 traffickers can remove or minimize job qualification requirements to attract people without experience or specific  
 775 qualifications, thus increasing the number of potential victims. In addition, traffickers can target vulnerable individuals  
 776 by specifying countries with a high number of undocumented immigrants, as these individuals are often desperate for  
 777 job opportunities. Such job postings may be advantageous for traffickers, as they can entice many potential victims with  
 778  
 779  
 780

781 the promise of employment. The job advertisement illustrated in Figure 4 indicates that no previous experience was  
 782 required to apply, which encouraged potential victims to express their interests and contact the trafficker. Fortunately,  
 783 Organization A was able to verify its fraudulent nature and prevent one of the victims from being recruited. "No  
 784 experience required" is a common phrase that can be searched to identify suspicious content. The *writing style* of these  
 785 posts also serves as a critical indicator.  
 786  
 787



800 Fig. 4. Indicator showing writing style

803 **4.3.2 Use of Informal Writing Styles.** Advertisements of suspicious nature typically employ an informal tone,  
 804 including *informal writing*, *emojis*, and *hyperlinks*. These elements are not typically found in genuine posts and can be  
 805 indicative of an attempt to deceive.  
 806

807 *Informal Writing* - . The *writing style* is also a significant indicator to identify suspicious posts. Traffickers often  
 808 create job postings with grammar and spelling errors as well as casual language, in contrast to the formal tone typically  
 809 found in legitimate company advertisements. In this writing style, the traffickers aim to entice people to consider the  
 810 opportunities. For example, as shown in Figure 4, job advertisements contain grammatical errors and cause concern.  
 811  
 812

813 *Emojis* - . The use of *emojis* in job advertisements is not a common practice and their presence often raises concerns.  
 814 Traffickers may use multiple emojis, such as symbols of money or flags, to capture the attention of potential victims  
 815 and lure them into applying for a job. People seeking employment in developing countries are commonly looking for  
 816 opportunities in the Global North. Thus, emojis that represent money or countries can quickly gain their attention. An  
 817 example of this is shown in Figure 5, which shows a job advertisement with Canadian flags.  
 818  
 819

820 *Links* - . Traffickers often include misleading links in their posts, which is another indication of fraudulent job  
 821 advertisements. These links typically lead users to fake job pages rather than promised job opportunities. The existence  
 822 of such deceptive link patterns is considered when assessing whether a post is associated with trafficking. In addition,  
 823 attractive packages are also a significant indicator.  
 824

825 **4.3.3 Offer Attractive Packages.** Traffickers typically format their advertisements in an appealing way to attract  
 826 potential victims and entice them to apply for opportunities. This section explores *salaries* and various *incentives*.  
 827

828 *Salary* - . Traffickers often resort to offering unusually *high salaries* as an incentive to recruit victims. Such salaries  
 829 are often considerably higher than the average remuneration for comparable positions in a country. Experts familiar  
 830 with the prevailing salaries and job packages in a given nation can easily discern these unrealistic offers.  
 831

*Incentives* - . Human traffickers often advertise job openings with attractive incentives, such as free transportation and housing, to entice people to respond to their advertisements. There have been several cases in which Organization A has encountered people who were offered free transportation for interviews. Using these attractive offers, traffickers can capture the attention of potential victims. In Figure 5, a trafficker promised to cover the costs of visas and flights for potential victims, leading several individuals to contact the suspected trafficker. Organization A has indicated that traffickers often assume these expenses when transporting them to another country, but subsequently use them to establish control over victims through debt bondage if the victims are unable to repay the costs.

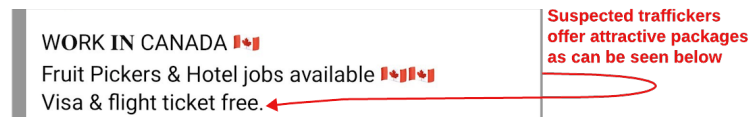


Fig. 5. Example of Job Advertisements - Indicator offering attractive packages

**4.3.4 Use of Known Trafficking Details.** Identifying suspicious job advertisements can also be achieved by uncovering specific details associated with known offenders from previous cases. This section explores the importance of *similar advertisements* and *well-known locations* as important indicators in this regard.

*Similar Job Advertisements* - . Traffickers frequently resort to duplicating information when creating deceptive advertisements. Organization A can identify such advertisements by referring to previous investigations. Suspected traffickers typically modify job postings marginally before republishing them on Platform A. If a job advertisement contains personal information or content that closely aligns with a previously confirmed case, the advertisement is flagged. In addition, individuals engaged in trafficking activities often utilize the same account to post new jobs. The project manager comments on this issue and states the following:

"These people use the same name for everything. It is not the first or second company I have seen with the same name. You know, they might use one phone number for WhatsApp" ( Project Manager)

*Trafficking Locations* - . The presence of *known trafficking locations* in Country A plays a pivotal role in identifying suspicious job advertisements. Whenever a job listing mentions these well-known trafficking spots, Organization A flags the post. Occasionally, community members leave cautionary remarks on such posts to deter individuals from falling prey to such schemes.

#### 4.3.5 Request for Personal Information.

Job advertisements that solicit personal information in the comments section warrant scrutiny, as human traffickers frequently request the contact details of potential victims to initiate private communication. Traffickers often employ these details to establish communication with people about interview invitations. In some cases, traffickers gather contact details about potential victims from other posts within the group and use them to send them interview invitations. Individuals frequently express skepticism about job offers within these groups, especially when they receive interview invitations from companies they never applied to, which raises concerns.

#### 4.4 Summary

The five themes discussed above can be summarized into three main categories that investigators aim to detect: 1) incongruencies, 2) irregularities, and 3) familiar misdemeanours. Investigators are continuously looking for incongruencies, which are elements of information that contradict or deviate from industry standards, and a broader understanding of the national job market, such as advertisements that attract wide audiences. Organization A ensures that researchers receive regular training on the contextual aspects of the job market, whilst also mandating them to undertake independent research.

Identifying oddities requires detecting information that deviates from norms such as unconventional practices or details that stand out as atypical. These norms may include the use of casual language styles and the improper solicitation of personal data. To detect such oddities, Organization A meticulously examines job postings and scrutinises each line to uncover subtle elements that deviate from standard recruitment advertisement practices.

Investigators also rely on identifying familiar misdemeanors by detecting similar information posted by traffickers. They achieve this by keeping a record of information associated with trafficking, collecting data on confirmed details related to human trafficking, and reviewing new information against these records.

Suspicious advertisements can also be identified by analyzing account profiles within the job advertisement groups. Several patterns were discovered in the accounts of suspected traffickers, which can help identify them and their job advertisements. These account profiles exhibit various characteristics that can be flagged:

- Account profile - Individuals who posted suspicious advertisements on social media typically had profiles containing only job-related content. On the platform, users can view the previous posts of an account holder if their profile is public. Most of these account holders' content consisted of job posts in a variety of industries and companies, with many exhibiting suspicious characteristics.
- Account Photo - The account profile's photos were also a point of suspicion, as many of the individuals who posted dubious content did not have a profile picture or had a picture that did not depict themselves. Instead, their photos contained quotes or other elements. In some instances, the accounts feature photographs captured by well-known models.
- Connections - The accounts under scrutiny typically exhibited a lack of connections or a small number of connections, raising suspicions and necessitating further investigation. This suggests that the account is predominantly employed for the dissemination of content about job opportunities, which may be used to recruit individuals for the nefarious activity of human trafficking.

Insights from this section can assist various stakeholders in combating human trafficking.

## 5 DISCUSSION AND RECOMMENDATIONS

This section discusses the findings and highlights opportunities for using technology to combat human trafficking, the challenges in developing detection software, and the ethical considerations involved. It also offers design recommendations for social media platforms to help prevent human trafficking and presents a framework for developing and deploying anti-trafficking software.

## 5.1 Opportunities to Tackle Online Recruitment using Technology

The findings highlight the opportunity to use technology to help stakeholders combat fraudulent jobs for human trafficking recruitment online. This section focuses on the various ways that technology can be used to address this problem.

**5.1.1 Reviewing job posts online.** The findings of this paper highlight the need for a tool that can identify suspicious posts related to human trafficking. Automating the process of identifying and shortlisting suspicious posts can significantly enhance Organization A's efficiency in handling a greater number of job advertisements, while also enabling Organization A to reallocate resources to other critical tasks. This aligns with previous literature [91], which suggests the development of a tool to detect suspicious job posts online. Current anti-trafficking software focuses mainly on the exploitation stage when victims have already been recruited [8, 9, 32, 33, 41, 52, 59–61, 85, 89, 91, 98, 99, 110, 111, 114, 119]. However, there is a lack of tools that target the human trafficking recruitment stage despite evidence that most recruitment activities occur online in several countries such as the US and Italy [39, 79, 103].

Software aimed at combating trafficking during the recruitment stage could benefit from integrating advanced technologies, such as a large language model (LLM)-driven intelligent system, to analyse and classify suspicious job postings. LLMs have been shown to outperform traditional machine learning approaches and also excel at classifying social media posts [22]. LLMs present a valuable opportunity in this field, particularly where access to labeled data is limited, as they deliver high performance with relatively small datasets. In contrast, traditional ML models typically require extensive training data [18, 62, 81].

**5.1.2 Investigating job posts** Organization A, as previously mentioned, conducts various investigative procedures following the shortlisting of suspicious advertisements, and on occasion, potential victims approach Organization A to confirm job opportunities. Developing a tool that enables people to request verification of employment opportunities from Organization A would streamline the process, facilitating the review and management of cases. This approach would be an improvement to the current practice of using a messaging application, such as WhatsApp, to make contact with Organization A. Furthermore, this tool would allow Organization A to initiate investigation procedures based on these requests or upon identifying suspicious job posts online. This software tool could include features for investigating jobs such as verifying the legitimacy of companies, phone numbers, and locations in job advertisements. For example, the tool could incorporate a company checker to investigate various aspects of a company's information, such as whether a company mentioned in an advertisement exists, its operational status, and contact details. This tool would enhance Organization A's efficiency in performing its duties and investigating more cases, thereby increasing the scalability of cases handled.

**5.1.3 Identifying potential traffickers and organized networks.** The findings indicate the existence of patterns in the profiles of suspected traffickers. Organization A also noted that traffickers often reuse job posts from the same or different accounts. Social media platforms have the opportunity to flag accounts that repeatedly post the same suspicious job postings. They can also identify potential organized networks by flagging accounts that share suspicious job posts with identical details, such as location and contact information.

Previous research has also shown that there are networks of traffickers operating on various online platforms that exploit multiple victims [10, 11]. In this case, a network of traffickers means a group of traffickers operating online to carry out illicit activities. These groups can range from a small number of traffickers exploiting one or a couple of victims to large networks involving influential figures operating in various countries [10]. There are opportunities

989 to use various technologies to flag potential traffickers and organized trafficker networks on social media. Trafficker  
990 networks can be identified on the basis of their connections and interactions. Ardakani [10] conducted a study to identify  
991 organized sex trafficking groups in Louisiana using online advertisements. The authors connected advertisements by  
992 using advertisement IDs, phone numbers, and the textual content of the advertisements through author attribution  
993 techniques. In contrast, Arenas et al [11] identified trafficker networks that promote OnlyFans accounts of their victims  
994 on Twitter. Both studies demonstrated the benefits of social network analysis in identifying trafficker networks [10, 11].  
995

996 Limited research has used content generated during the recruitment stage to identify potential traffickers and their  
997 networks. Identifying organized networks during this stage can help platforms flag traffickers and prevent them from  
998 sharing advertising opportunities, thereby reducing the recruitment of individuals. Furthermore, there is a potential  
999 opportunity to verify whether organized behavior can be identified through mentions and links in job posts, similar to  
1000 the approach taken by Arenas et al. [11] in analyzing OnlyFans content.  
1001

1002 Implementing these recommendations holds significant potential to help combat human trafficking recruitment on  
1003 online platforms. However, several challenges may hinder the performance of these tools, potentially affecting their  
1004 effectiveness in both the short- and long-term. These challenges are discussed in the following section.  
1005  
1006

## 1007 5.2 Challenges of using Automated methods to identifying and investigating Recruitment

  
1008

1009 There are potential obstacles to effectively developing anti-trafficking tools or features for human trafficking recruitment,  
1010 whether for monitoring or investigation.  
1011

1012 **Accuracy.** Achieving accuracy in anti-trafficking software is challenging due to the lack of ground truth data. Most  
1013 solutions rely on expert-labeled data, which can be prone to errors, affecting the accuracy of the model and the trust in  
1014 these tools [91, 99]. Furthermore, most of the posts reviewed in this paper showed a tendency to use informal language,  
1015 complicating accurate classification, since slang and vocabulary vary by country. The informal text on social media can  
1016 significantly influence the accuracy of machine learning models [7, 82]. Limited data availability further hinders model  
1017 development, as organizations are often reluctant to share data due to privacy and proprietary concerns.  
1018  
1019

1020 **Compliance.** Meeting regulatory requirements is another significant challenge. Compliance with data collection and  
1021 processing laws, such as the General Data Protection Regulation (GDPR), affects tool design and deployment feasibility  
1022 [21]. For example, these laws can restrict the collection and processing of data obtained through automated means  
1023 such as web crawling, hindering the analysis of information left by traffickers and victims. Most data related to human  
1024 trafficking for automation purposes is derived from crawling the web for advertisements written by traffickers, such as  
1025 those that advertise victims on classified sites and job boards.  
1026  
1027

1028 **Integration.** Entities like Organization A require access to various types of data to conduct investigations, which  
1029 poses a challenge when developing tools to aid the investigation process. Such tools would need collaboration with  
1030 third-party applications. However, collaboration between anti-trafficking stakeholders is challenging [21], as public and  
1031 private organizations are often hesitant to share data or integrate their modules. An alternative is for stakeholders to  
1032 create their own datasets, such as a company database to verify companies. However, this approach may not be feasible  
1033 for all needed data such as phone numbers because of privacy concerns.  
1034  
1035

1036 **Long-term performance.** The long-term performance of anti-trafficking software can be affected by factors such  
1037 as feedback loops and concept drift. Feedback loops, in which an AI system's predictions influence future data, can  
1038 reinforce biases in AI systems, leading to a narrow focus on specific cases [92, 112]. Concept drift occurs when statistical  
1039

properties change over time, making historical patterns inapplicable to new data [42, 54, 86]. Human traffickers tend to adapt their methods to avoid detection, such as using emojis instead of text, increasing the likelihood of concept drift, degrading the performance of the model [113]. Concept drift and risky feedback highlight the importance of developing adaptive AI systems that can continuously learn and evolve to effectively counter new tactics and maintain accuracy in identifying trafficking activities.

**Feasibility.** Anti-trafficking organizations and other stakeholders typically operate with limited resources. Developing, implementing, and maintaining anti-trafficking tools requires significant resources [21]. In addition, meeting the growing requirements for detecting trafficking activities can be financially challenging. Organization A and previous research [30] have confirmed that traffickers use several social media platforms and job boards to expand their operations. Limited financial and non-financial resources impact the ability to scale operations, particularly in resource-constrained regions like the Global South.

In addition to the challenges discussed in this section, there are also ethical concerns related to anti-trafficking tools, which are detailed in the following section.

### 5.3 Ethical and Privacy Considerations for Developing and Deploying Anti-Trafficking Software

A major concern when using anti-trafficking tools is the presence of data bias [48, 96]. Data bias can arise from various sources, such as a lack of ground truth data, existing biases in training data, and implicit human biases during tool design [75]. Data annotation is a significant contributor to data bias and is influenced by factors such as race and gender [51, 67, 75]. Biases in anti-trafficking software can lead to false positives, negatively affecting marginalized groups.

The misidentification of individuals as traffickers or victims can have significant consequences, such as stigmatisation of those incorrectly identified as traffickers and denial of access to certain resources for misidentified victims (Author Work Under Review). For example, some anti-trafficking software has been associated with adverse outcomes for individuals using online platforms in the US. Following the implementation of the FOSTA-SESTA Act, several platforms, including Craigslist and Reddit, removed all sections, such as forums related to sex work, and now employ AI models to block the content associated with sexual activity, inadvertently resulting in the banning of sex workers [23, 63, 90]. This loss of digital space forced many sex workers to operate on the streets, placing them in dangerous situations and increasing their vulnerability to violence and exploitation [23]. A sex worker reported that within the first month of the law's enactment, 13 individuals were reported missing and two were confirmed to be deceased ([90]). The SAFE SEX Workers Study Act was introduced [80] to address the unintended consequences of FOSTA-SESTA. This legislation aims to investigate the effects of FOSTA-SESTA on sex workers and use the findings to inform potential amendments or possibly even lead to the repeal of the law.

The implementation of anti-trafficking tools that target recruitment may lead to unintended consequences. For example, online platforms may erroneously ban legitimate companies because of false associations with fraudulent human trafficking job advertisements. Moreover, job advertisement groups can potentially be removed in a manner similar to the sex work forums discussed above. This could adversely affect individuals who post legitimate content and impede job seekers' ability to find employment opportunities if the groups are entirely eliminated.

In addition, developing a software tool that analyzes job listings on a platform raises privacy concerns due to the sensitivity of the data it would access. Such tools would have access to posts that may contain personal information, such as contact details, thus potentially exposing them to harm. Organization A also requires personal information for their investigations, and if a tool collects this information, it could pose privacy risks. Previous research has highlighted

1093 concerns about potential privacy breaches associated with the use of these types of anti-trafficking tools [27, 59, 95].  
1094 Tools may inadvertently collect data that are not related to human trafficking such as data on voluntary sex workers  
1095 [27]. Therefore, there is a concern that information collected for investigating fraudulent job advertisements could also  
1096 be used for purposes other than job classification. Anti-trafficking software has the potential to be misused for other  
1097 negative purposes, such as illegally tracking individuals or companies [28]. Any errors or missteps in this area can  
1098 have severe consequences [28, 74], potentially causing harm to victims and other individuals in society. Therefore, it is  
1099 important to develop strategies to preserve privacy and protect important information during the design stage.  
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1101

## 1102 5.4 Design Implications for Social Media Platforms

1103 Social media platforms are obligated to protect users from harm online, including human trafficking [2]. Social  
1104 media platforms should take a proactive approach to combating human trafficking recruitment. We present a set of  
1105 recommendations for social media companies to consider when designing, developing, and iterating their platforms to  
1106 promote safety against human trafficking recruitment.  
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1109  
1110 **5.4.1 Stringent Guidelines.** We recommend that designers implement an additional layer of security by imposing  
1111 stricter criteria for the entry and posting of content in job marketplaces and groups. The current process of admitting  
1112 individuals to groups poses a risk to vulnerable individuals. Social media platforms should proactively establish  
1113 and enforce rules for job opportunity-related groups, rather than rely solely on community moderation and group  
1114 administrators. For example, social media platforms possess the resources and data necessary to develop effective  
1115 methods to detect and remove fake profiles from their networks and prevent them from accessing job marketplaces  
1116 and groups. In the last half of 2023, LinkedIn used automated and manual processes to stop and remove more than 60  
1117 million fake accounts from their platform. Furthermore, Facebook sanctioned more than 630 million accounts in the  
1118 first quarter of 2024 [66]. The prevalence of fraudulent profiles on social media has allowed traffickers to easily identify  
1119 victims [13]. Social media platforms can also use the additional indicators identified in this study to flag suspicious  
1120 accounts attempting to join job advertisement groups, alongside their efforts to remove fake accounts.  
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1123  
1124 **5.4.2 Warning Mechanisms.** Social media platforms should integrate warning labels for users who join job market-  
1125 places and groups to inform them of the potential risks associated with such communities. By raising awareness of  
1126 human trafficking and other illegal activities, people can exercise greater caution when seeking online opportunities.  
1127 Platforms can also send reminders after a certain period to remind users of the dangers associated with these communi-  
1128 ties. Research has shown that occasional reminders can have a positive impact on behavior in various areas, including  
1129 health [77]. In addition, warning labels for online misinformation have been shown to be effective in increasing user  
1130 awareness of misleading content [24, 64].  
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1134 **5.4.3 Cautionary Messages.** Social media platforms should implement cautionary messages to discourage users from  
1135 sharing personal information such as their contact details, as traffickers often exploit this information to lure victims to  
1136 participate in fraudulent interviews. By displaying informative notifications that highlight the potential risks of sharing  
1137 such information, such as human trafficking, users may be better equipped to avoid falling victim to recruitment scams.  
1138 Furthermore, social media platforms can flag job advertisements that ask users to publicly disclose their contact details  
1139 because genuine job listings generally do not require this information to be shared openly. However, it is important to  
1140 consider the potential unintended consequences of such measures, as users may be annoyed by constant reminders  
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and warnings. Therefore, social media platforms should explore less intrusive options or allow users to turn off these notifications if desired.

**5.4.4 Moderation.** Social media platforms should take a proactive approach to analyzing job posts and account profiles for signs of human trafficking to prevent them from posting job advertisements. Platforms can use human and automated moderation. Automated moderation can involve mechanisms such as time delay can be implemented while a post is reviewed. Content moderation should always involve experienced individuals in making final decisions before implementing drastic measures, such as removing an account from the platform.

When developing anti-trafficking software, it is crucial to consider several factors to ensure that ethical concerns and challenges are adequately addressed. The following section explores some of these key factors.

## 5.5 A framework for developing and deploying anti-trafficking tools

This section presents key factors that stakeholders should consider when developing and deploying anti-trafficking tools.

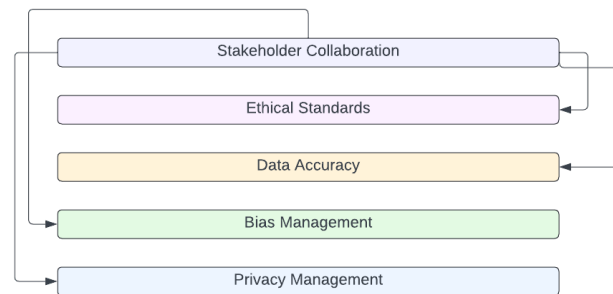


Fig. 6. Framework for developing and deploying anti-trafficking tools

**5.5.1 Stakeholder Collaboration.** The development process should engage with various relevant stakeholders during the design stage, especially anti-trafficking organizations and law enforcement, who are some of the main users of these types of tools [74] and are also some of the most knowledgeable about the crime. To help identify stakeholders in this field, especially law enforcement, researchers can use mailing lists such as Rephrain [? ], which includes various stakeholders working on online harms, including law enforcement. In addition, using professional platforms such as LinkedIn to conduct customized keyword searches can help identify people with relevant expertise.

Similarly to this research, anti-trafficking organizations can also be identified using search engine queries. A few observations were made during the collaboration process:

- (1) Efforts should be made to find common areas of interest to provide incentives for anti-trafficking organizations to partner with academic researchers.
- (2) Researchers should aim to write a clear message that highlights their background and research plan to increase credibility, while ensuring that the incentives are evident to prompt responses.

1197 (3) Efforts should be made to start discussions with institutions early regarding contractual agreements, such  
1198 as NDAs, as these can lead to delays. The agreements should ensure that the integrity of the organization is  
1199 maintained, while allowing academic researchers the freedom to publish and present results.  
1200

1201 **5.5.2 Ethical Standards.** Human trafficking is a sensitive subject that requires careful consideration. There is a need to  
1202 develop best ethical guidelines and practices for researching online trafficking and developing anti-trafficking software.  
1203 These practices and guidelines should be developed closely with experts in the domain. An ethical review process and  
1204 risk assessment should always be conducted before beginning a project, involving domain and non-domain specialists,  
1205 to assess the project’s plans and strategies and whether they meet the ethical standards. The ethical evaluation will  
1206 allow stakeholders to make well-informed decisions and determine whether the proposed project complies with ethical  
1207 standards throughout the development and post-deployment stages. The risk assessment will also help identify any  
1208 risks in addition to privacy and bias that can occur with technology and ways to mitigate such risks.  
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1212 **5.5.3 Data Accuracy.** Data annotation is crucial in anti-trafficking tools due to limited ground truth data. Stakeholders  
1213 should involve experts in annotating unlabeled data to ensure that domain knowledge is accurately represented. At  
1214 least one expert should participate in an iterative labeling process until the data quality is satisfactory. Involving  
1215 multiple experts allows developers to validate labels using methods such as the Inter-Annotator Agreement (IAA),  
1216 which measures the agreement between annotators [19, 115].  
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1219 After creating or gaining access to a dataset, it is necessary to ensure its high quality to maintain accuracy and comply  
1220 with industry and government regulations [34]. We recommend using both quantitative and qualitative evaluation  
1221 methods before training the model. Automated inspection can detect and rectify problems such as spurious correlations  
1222 [48, 84, 93, 109], enhancing data accuracy and consistency while minimizing human errors [34]. Despite the efficiency  
1223 of automated dataset assessments in identifying certain issues, human-conducted inspections can be advantageous in  
1224 revealing other problems that may not be readily apparent, such as biases related to race and gender. Furthermore,  
1225 manual audits can offer valuable insight in methods to improve data quality [57]. Kreuzer et al. [57] state that human-led  
1226 inspections are particularly effective at recognizing subtle errors, inconsistencies, and other issues that could evade  
1227 detection by automated methods alone. This is very important for a field like human trafficking where experts are  
1228 encouraged to be in the process of developing the tool.  
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1232 **5.5.4 Bias Management.** Stakeholders should develop improved data collection and annotation methods that reduce  
1233 instances of data bias [75, 87] by ensuring diversity in the data [87]. We also recommend that the teams responsible  
1234 for collecting and annotating data should be diverse and consist of representatives from various demographics and  
1235 skill sets. Stakeholders should include members from marginalized groups that are affected by these systems, such as  
1236 victims [29].  
1237

1238 Furthermore, stakeholders should consider employing algorithms and tools to eradicate bias in datasets using  
1239 debiasing strategies. These algorithms and tools, such as DRiFt (Debias by Residual Fitting) [16], apply statistical  
1240 techniques to identify and mitigate biases [15, 16, 48, 65]. Machine learning models have shown poor performance  
1241 for people of color and females [65], which should be considered when developing anti-trafficking solutions. Most  
1242 automated data bias correction methods involve the use of statistical techniques, which raise concerns about potential  
1243 inaccuracies; therefore, it is important to combine them with expert validation. Furthermore, it is crucial to assess the  
1244 consequences of the dataset when using algorithms because some deletion processes can lead to additional issues, lower  
1245 accuracy, and impact the decision-making process of a model [56].  
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1251 **5.5.5 Privacy Management.** Stakeholders must be transparent about their plans to protect user data from the start  
1252 of the project. To address privacy risks, several aspects should be considered when developing a tool. Firstly, data  
1253 minimization should be prioritized, which involves collecting only essential data to achieve the objectives [45]. By  
1254 collecting fewer data, the risk to victims and vulnerable groups in society can be minimized, simplifying the process of  
1255 ensuring data privacy [26].  
1256

1257 In addition, stakeholders should refrain from collecting personal information during data collection whenever  
1258 possible. In cases where collecting personal information is unavoidable, it is crucial to erase or mask such information  
1259 using anonymization and pseudonymization techniques [55, 76, 106]. These techniques are particularly useful when  
1260 handling sensitive data related to human trafficking and are commonly employed in fields such as healthcare to protect  
1261 patient data [5, 58].  
1262

1263 Stakeholders should also perform periodic audits of tools and their data management practices to ensure continuous  
1264 compliance with privacy standards and detect and address vulnerabilities (Author Paper Under Review). These audits  
1265 provide a means to evaluate whether the tool adequately upholds the privacy standards put in place and offer an  
1266 opportunity to pinpoint any shortcomings or potential threats connected to the tool's data-handling processes.  
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## 1269 6 CHALLENGES AND LIMITATIONS

  
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1271 At the outset of our collaboration with Organization A, we hypothesized that they engaged in active collaboration with  
1272 a diverse range of anti-trafficking stakeholders, particularly law enforcement agencies, due to the scale and severity  
1273 of the issue. However, through direct observation, we identified a significant lack of collaboration stemming from  
1274 various challenges discussed in Section 4.2.4. This unexpected discovery prompted us to explore not only the barriers to  
1275 collaboration, but also the broader challenges faced by Organization A.  
1276

1277 A primary challenge during this study was maintaining the integrity of Organization A's work, with concerns about  
1278 publishing findings at an academic conference. This reflects a larger issue in the field, where there is apprehension  
1279 about openly sharing investigative methods for fear that traffickers could adapt their strategies.  
1280

1281 We obtained permission from Organization A to share findings while anonymizing crucial details such as platform  
1282 names and the country of focus. This approach aimed to prevent inadvertent identification and alleviate concerns.  
1283 Balancing the exchange of crucial insights with the academic community and protecting the effectiveness of stakeholders'  
1284 efforts is a major challenge in this field.  
1285

1286 A major limitation of this study was its focus on a single online platform in one African nation. Although traffickers  
1287 utilize various online channels, Organization A primarily targets Platform A for its work as previously mentioned.  
1288 Unfortunately, our efforts to partner with other organizations in this field proved challenging. However, it is crucial for  
1289 the academic community to expand investigations to encompass a wider range of online platforms, such as job boards,  
1290 and to explore different countries. Research across various platforms and regions will yield a more comprehensive  
1291 understanding of online human trafficking activities.  
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## 1294 7 CONCLUSION

  
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1296 This study employed in-person and digital observations, semi-structured expert interviews, and case analyses to  
1297 investigate human trafficking recruitment on social media platforms. The findings highlight the tactics used by human  
1298 traffickers on these platforms, and the indicators associated with suspicious job advertisements and profiles. Furthermore,  
1299  
1300

1301 the study discusses the methodologies that anti-trafficking organizations employ to identify and investigate fraudulent  
 1302 job advertisements. It makes four primary contributions: (1) it sheds light on the strategies employed by traffickers,  
 1303 particularly their use of deceptive fraudulent job advertisements as a tool for online recruitment, and examines the  
 1304 nature of these advertisements; (2) it provides an empirical understanding of the techniques used by organizations  
 1305 combating human trafficking to investigate recruitment activities on social media platforms, as well as the obstacles they  
 1306 encounter; (3) it highlights the ethical considerations and difficulties associated with developing software to combat  
 1307 trafficking, offering suggestions to address these concerns; and (4) it outlines design recommendations for potential  
 1308 features that could be implemented on social media platforms to reduce the risk of human trafficking recruitment. The  
 1309 purpose of this study was to contribute to the existing body of knowledge on developing safer digital environments  
 1310 and combating online human trafficking recruitment. Future research should focus on expanding the scope of this  
 1311 investigation to other regions where online recruitment through fraudulent jobs is a significant issue. In addition, other  
 1312 online platforms, including job boards, which are also hubs for fraudulent job listings used in human trafficking, should  
 1313 be examined to further enhance our understanding of this phenomenon.  
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## 1318 8 ACKNOWLEDGMENTS

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