Crowdsourcing to Tackle Online Child Sexual Exploitation: Europol's 'Stop Child Abuse—Trace an Object' Platform

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Abstract This article examines how Europol's 'Stop Child Abuse—Trace an Object' (SCATO) platform uses crowdsourcing to collect tips from the public in order to tackle online child sexual exploitation. The article evaluates the platform's effectiveness based on three key factors: how easy it is for the public to access the platform, the transaction costs involved in gathering information from the public, and how trust is established between the public and law enforcement agencies. By analyzing Europol documents and conducting interviews with law enforcement officers and non-governmental organizations, the article argues that the SCATO platform is user-friendly and accessible to the public. However, in order to reduce the searching cost of intelligence gathering, the images shared on the platform should encourage high-value reporting without compromising victim anonymity. Additionally, the platform should also benefit from clear guidelines and feedback mechanisms to encourage more public participation.

Introduction

The rapid transformative advancement in the internet and information technologies has a facilitating impact on the dissemination of information between individuals residing in different countries. This technological infrastructure, however, has also enabled the sharing and the trading of improper content depicting the sexual exploitation of minors (Taylor and Quayle, 2003; Quayle and Newman, 2015). The easy accessibility and anonymity offered by the internet, while encouraging the offenders (Merdian et al., 2009; Owens et al., 2016), created a relentless challenge for law enforcement agencies (LEAs) to locate the victim and offender (Yerkes, 2021). Investigating a high volume of child sexual imagery without human, fiscal and technical resources adds a considerable hindrance to tackling online child sexual exploitation (OCSE) (Goodison et al., 2015; Dwyer et al., 2016). As a result, community support based on open-source intelligence gathering became vital

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for LEAs (Açar, 2018). Many police departments began establishing online platforms to increase awareness of OCSE and mobilize public support to lower their intelligence gathering costs (Yerkes, 2021).

One of these online platforms initiated by Europol is 'Stop Child Abuse—Trace an Object' (SCATO) (Europol, 2022c). The website displays object images associated with victims by asking civilians to report any knowledge regarding the origin of these objects (Europol, 2017). Any information the crowd provides is used to determine the country of origin and location of the victim and offender (Europol, 2018). The intelligence gathering model utilized in the SCATO platform is often referred to as 'crowdsourcing' (Howe, 2006; Europol, 2018) which can be categorized as a different form of the 'sharing economy' model (Aloisi, 2016; De Groen *et al.*, 2016; Taeihagh, 2017). In this distributed problem-solving model, a vast number of individuals contribute to the online problem-solving process per the given task required by the crowdsourcer (Brabham, 2008). According to the executive director of Europol, Cathrine De Bolle, the European policing agency has been using crowdsourcing to locate the cybercrime victims (World Economic Forum, 2019). The SCATO, in that sense, is the central platform where Europol benefits from the crowdsourcing model (Europol, 2017).

In the existing literature concerning OCSE, one of the biggest challenges for LEAs in handling online child sexual abuse cases is the public reluctance to report illegal content directly to the policing agencies (Choo, 2009). In this context, many studies have examined the effectiveness of different public intelligence gathering strategies of LEAs (Açar, 2017; Baines, 2019; Kokolaki *et al.*, 2020; Christensen *et al.*, 2021). Including the massive contribution of the intelligence from private sector tech companies via NCMEC (Açar, 2017). Crowdsourcing is one of the distinctive theoretical frameworks in this field that aims to explain LEAs open-source intelligence gathering method (Huey *et al.*, 2013). From a crowdsourcing perspective, online platforms are a practical option for LEAs to tackle OCSE to fill their resource gap and engage with the public (Yerkes, 2021). However, adding new national and regional level repositories with analogous natures

undermines the success of the efforts that may be achieved in a single global database (Franqueira *et al.*, 2018; Açar, 2020). Despite the increasing number of these platforms, Europol's SCATO initiative has been shown as one of the best examples of how the crowdsourcing approach has been in use by LEAs to tackle OCSE (Muraszkiewicz, 2018; Açar, 2020; Yerkes, 2021). A similar model is also suggested for uncovering victims of human trafficking (Muraszkiewicz, 2018). Even though Europol's SCATO platform has attracted attention in the literature, in a hermeneutic review process in which topics of crowdsourcing and crowdsourcing in crime investigation are reviewed, Europol's crowdsourcing model and its effectiveness have not been scrutinized in detail so far. There is not much evidence in the literature questioning in what aspects Europol's SCATO platform incentivise public to the problem-solving process. Due to the vague nature of the term effectiveness (Oliver, 1991), in this study, effectiveness refers to improving public engagement to collect actionable intelligence. Considering the knowledge gap in the OCSE literature, this article aims exploring the crowdsourcing model of Europol's SCATO platform and its effectiveness through the sharing economy platform parameters.

The article contributes to both research and practices twofold. First, it is the first empirical study where Europol's SCATO platform has been examined through the crowdsourcing conceptual framework. This article may inspire other empirical works to use the same analytical framework while examining similar platforms initiated by public or non-governmental organizations. Second, the study's empirical findings can help Europol and other LEA executives develop their current crowdsourcing platforms or create new ones to improve public engagement for practical intelligence and resource sharing.

The article's methodological approach will be described in the following section. The next section will introduce the main theoretical framework of this study, the crowdsourcing model. The discussion section will debate the SCATO platform's effectiveness through crowdsourcing variables. The concluding section will summarize the research findings and propose new research ideas and practical recommendations for the public authorities managing these platforms.

Methodology

Due to the absence of open-source quantitative metadata about the Europol SCATO platform, this study relied on a qualitative methodology. The relevant data were obtained from two qualitative data sources. These are publicly available Europol documents found on the Europol website and three semi-structured interviews conducted with public and private sector actors familiar with the SCATO platform and Europol's crowdsourcing model. Despite multiple attempts to recruit more participants, the number of interviewees was lower than anticipated due to non-responses or confidentiality concerns. Although this could be considered as an inevitable data limitation, similar responses given by interviewees accepted as an indication that data saturation has been reached. The data acquired from two primary sources were triangulated with the current literature on OCSE, crowdsourcing, sharing economy, and Europol.

This article employed three sharing economy variables to indicate the effectiveness of Europol's crowdsourcing model. These are the most common sharing economy variables in the literature and roughly appear with similar names in other studies. The first variable, 'low barrier accessibility' (Rifkin, 2001; Rose *et al.*, 2015), investigates how the online platform provides easy access to critical mass who are expected to share tips with Europol. The second variable, 'transaction cost' (Hamari *et al.*, 2016; Henten and Windekilde, 2016; Martin, 2016), examines whether the online platform facilitates the LEAs to reach high-value tips coming from the crowd that covers their human, fiscal and technical resource gap. High-value tips refer to vital information provided by the public that is crucial to solving a crime. The third and final variable, 'trust-building' (Dambrine *et al.*, 2015; Thierer *et al.*, 2015; Ert *et al.*, 2016), investigates the trust-building mechanism integrated into the SCATO platform that encourage high-value public reporting.

Crowdsourcing

Sharing is an altruistic behaviour that aims mutual use of resources or space (Cohen and Zehngebot, 2014; Munger, 2018). It is an act of providing something and supporting others (Belk, 2014; Sedkaoui and Khelfaoui, 2020). In the last decade, sharing has shown remarkable transition. Globalization, economic crises, environmental concerns, and exponential developments in digital technologies have changed the prominent patterns in customer behaviour (Sedkaoui and Khelfaoui, 2020). The new socio-economic exchange focused on sharing resources through digital platforms (Bardhi and Eckhardt, 2012). As a result of this transition, a new generation of sharing economy was born that had a disrupting impact on many industries including accommodation (Airbnb), mobility (Uber), freelance market (Upwork), crowdfunding (Indiegogo) (Christensen *et al.*, 2015). Although there are a plethora of terms and definitions referred to as the sharing economy (Botsman, 2013; Codagnone and Martens, 2016; Gussen, 2020; Sedkaoui and Khelfaoui, 2020), it is simply identified as sharing under-utilized or underused resources with others through an online platform for money or charitable purposes (Botsman and Rogers, 2010; Gansky, 2010; Belk, 2014; Schor, 2015). There are many variations of sharing economy platforms (Sedkaoui and Khelfaoui, 2020), and one of these is 'crowdsourcing' (Aloisi, 2016; De Groen *et al.*, 2016; Taeihagh, 2017). The term 'crowdsourcing' was first coined by Howe. He defined crowdsourcing as an open-call task performed by a large volunteer group of individuals with varying knowledge and skills (Howe, 2006). Four pillars for defining crowdsourcing were identified: the online platform, the crowd, the task, and the crowdsourcer (Hosseini *et al.*, 2014).

Similar to sharing economy, in crowdsourcing, there is an 'online platform' where the task is broadcasted. The crowd and crowdsourcer interact on this platform (Karachiwalla and Pinkow, 2021). The peer-to-peer interaction in sharing economy (Westerbeek, 2016) is replaced with crowd-to-crowdsourcer in crowdsourcing.

The 'crowd' is a large number of individuals motivated for various reasons such as earning income, developing skills, or altruistic reasons like 'love of community' (Brabham, 2010; Garcia Martinez, 2017). The crowd remains on the provider side of the platform in this model. In the literature, there

is no consensus on the crowd's composition. It can be an anonymous group of people, loosely bounded community members, a critical mass, well-trained individuals or consumers (Estellés-Arolas and González-Ladrón-de-Guevara, 2012).

The 'task' is the third essential component of crowdsourcing which is exchanged between crowd and crowdsourcer. In crowdsourcing, the crowd is free to participate voluntarily in problem-solving process (Afuah and Tucci, 2012). As the task becomes meaningful to the crowd, it positively impacts their motivation and contribution (Görzen, 2021). A precise formulation of the task and well-delineation of problems increase the quality of the solution provided by the crowd (Afuah and Tucci, 2012).

The 'crowdsourcer' is the final element of crowdsourcing. It is the demand side of the crowdsourcing process. The crowdsourcer is responsible for formulating the task, evaluating and implementing the solutions (Karachiwalla and Pinkow, 2021).

As crowdsourcing has the potential to facilitate the use of under-utilized problem-solving skills of the crowd, it can be a sustainable solution for public sector actors to fill their resource gap (Chasin and Scholta, 2015). Whether utilized by the public or private sector, the effectiveness of crowdsourcing relies on three major factors, including low barrier accessibility, reduction of transaction cost and the existence of trust-building mechanisms.

Conceptual analysis of stop child abuse—trace an object platform

Based on the crowdsourcing conceptual framework, in the following sections effectiveness of the SCATO platform on open-intelligence gathering will be discussed according to the three variables: 'low barrier accessibility', 'transaction cost' and 'trust building'. Each variable will be examined through the crowd and crowdsourcer perspective to understand to what extent the platform is an effective tool to tackle OCSE.

Low barrier accessibility to the stop child abuse—trace an object platform

One of the crucial factors for an efficient crowdsourcing strategy is providing a low barrier entry to

the crowd to share their diverse knowledge with the crowdsourcer. In recent years, the internet and technological infrastructure provided by online platforms have enabled a low barrier entry for individuals to share their resources (Rifkin, 2001). Anyone with an internet connection can access these platforms and interact with the crowdsourcer. The online platform, thus, plays a key mediating role between crowd and crowdsourcer (Leicht *et al.*, 2016) for network participation (Ganapati and Reddick, 2018) and facilitating the problem-solving process (Zogaj *et al.*, 2014). The online interaction provided by the platform also removes geographical barriers (Gansky, 2010; Belk, 2014). The crowd and the crowdsourcer can maintain knowledge exchange from distant locations (Afuah and Tucci, 2012).

The website associated with the SCATO platform is the central place where the crowd can provide a tip to Europol. It is a user-friendly platform for the concerned crowd as far as they have an internet connection. The easy accessibility to the platform through the internet significantly removes the geographical barrier for the crowd. Crowd members can report local information seen in the picture from anywhere worldwide.

Individuals who know OCSE material are only required to fill out a simple online form with two sections. In the first section, they only type their email address for communication purposes. In the second section, they are required to report the information associated with the picture that can help LEAs locate the victim and offender (Europol, 2022c). Other than these two, no other information is wanted from the crowd to provide easy accessibility to their reporting process.

Europol also promotes easy access to the platform through different social media platforms such as Twitter (Europol, 2022a) and LinkedIn (Europol, 2022b). On these social media platforms, Europol promotes the SCATO platform's activities to attract a bigger crowd's attention and encourages them to share their tips with Europol. Moreover, the SCATO platform's online links are cross-posted by well-known online platforms aiming to tackle OSCE (Online Interview_3), such as the Australian Centre to Counter Child Sexual Exploitation and Bellingcat. Their cross-posting also provides a low-barrier entry to the crowd who do not know the SCATO platform before.

The role of stop child abuse—trace an object platform in reducing transaction cost

The second important feature of a sharing economy is that it reduces the transaction cost for platform members. The transaction cost is often regarded as all costs associated with searching, contacting, and contracting (Williamson, 1985; Aigrain and Aigrain, 2012; Munger, 2018). It includes expenses such as intermediary fees, costs linked with transactions, logistical costs for delivery and service related outlays and other costs associated with barriers to communication and matchmaking (Munger, 2018). The technological infrastructure utilized by crowdsourcing platforms eases the listing of tasks and distribution of problem-solving processes to a big audience (Wirtz et al., 2019). These platforms enable easy access to a large crowd with diverse knowledge, skills and expertise (Karachiwalla and Pinkow, 2021). As the number of people in the crowd increase, it creates a knowledge diversity for the crowdsourcer. If the crowdsourcer manages to refine knowledge diversity of a big crowd, it increases the possibility of receiving a high number of quality solutions (Afuah and Tucci, 2012; Blohm et al., 2013). According to Frey et al. (2011), a crowd with diverse knowledge and skills can perform well during problem-solving by making connections between distributed knowledge. This crowding effect, as a result, reduces the transaction cost for the crowdsourcer to acquire diverse and valuable external knowledge (Mack and Landau, 2020).

The success of a crowdsourcing platform also depends on how it attracts and motivates the crowd to participate in the problem-solving process (Ford et al., 2015). In this respect, the problem's complexity is the primary determinant in encouraging or discouraging the crowd (Lee et al., 2015; Ghezzi et al., 2018). Well-delineated and manageable tasks that are easier to understand encourage crowd participation because individuals in the crowd may have no specific skills or expertise to participate in problem-solving process (Rouse, 2010; Muhdi et al., 2011; Afuah and Tucci, 2012). To receive high-value solutions, the crowdsourcer should present the crowd with a well-defined, easily understandable task. With less complex and well-defined tasks, the crowdsourcer will receive positive solutions more quickly, lowers the transaction cost of the problem-solving process.

Crowdsourcing as an effective problem-solving model also offers a low-cost alternative for crowdsourcer by mobilizing the knowledge and expertise of the crowd (Zhao and Zhu, 2014; Ford et al., 2015). It compensates for the limited resources of crowdsourcer which is sometimes not sufficient for the resolution of the problem (Afuah and Tucci, 2012; Ye and Kankanhalli, 2017). Obtaining knowledge from a voluntary crowd rather than using its resources creates a consumer plus for the crowdsourcer. Consumer surplus, in that sense, is the difference between the highest resource the crowdsourcer is willing to allocate to the problem-solving process and the actual resource allocated for knowledge acquisition from the crowd (Sundararajan, 2016). Crowdsourcers generate a surplus by allocating fewer resources. As online platforms reduce transaction costs and increase consumer surplus, they become more popular for crowdsourcing knowledge, expertise and skills (Afuah and Tucci, 2012; Boudreau and Lakhani, 2013).

In an OCSE case, reaching the crucial evidence on time is vital for the victim's safety. The sooner the LEAs receive a high-value tip, the greater the chance of preventing the dissemination of these images and rescue victims. Otherwise, the longer it takes to begin the investigation, the more likely the offender may destroy or hide the evidence, change the victim's location, and the transaction of images can be out of control (Yerkes, 2021). Given the limited time available to examine high-volume OCSE images and the insufficient number of LEA employees, high-quality tips provided by the public may increase the chances of saving victims and halting the spread of these images. Moreover, public support for identifying the victim can create a consumer surplus for the LEAs. Policing departments can allocate less human and technical resources for these extremely time-consuming investigations that sometimes have a traumatic impact on investigators (Perez et al., 2010). In this regard, the crowdsourcing model is expected to reduce the transaction cost for LEAs to acquire critical information with less human and technical resource allocation to stop the spread of OCSE material, save victims,

and apprehend offenders. Crowdsourcing, in this respect, is not delegating police authority to the crowd but rather supplementing the human and technical resources of LEAs.

According to senior LEA officials from two countries in charge of investigating OCSE cases, crowdsourcing is not always the best way to investigate OSCE cases. They claim that crowdsourcing has the risk of increasing transaction costs for LEAs while they are collecting intelligence (Online Interview_1 and Online Interview_2). When the LEAs receive tens of thousands of tips which have no value for the investigations, they only bring a new burden for investigators rather than reducing their workload (Online Interview_1 and Online Interview_2). Therefore, high-value tips are essential for an efficient crowdsourcing model that reduces the transaction cost for LEAs.

In terms of receiving high-value tips, the task associated with the OCSE case should be easy to understand and interpret by a crowd with diverse knowledge and skills (Rouse, 2010; Muhdi *et al.*, 2011; Afuah and Tucci, 2012). Although identifying the victim, crime scene or offender through a simple picture is not a complex task for the crowd; the pictures shared on the SCATO platform do not always quickly spark recognition from the public. The main reason for this inefficiency is that Europol rightly refrains from sharing a complete picture of the crime scene and victim because more details risk revealing the minor's identity and jeopardizing the ongoing investigations (Europol, 2022c). As a result, the simple task designed to engage the audience and deliver high-value solutions became more challenging for the general due to obscured images. This challenge is also apparent in Europol's official figures. According to Europol documents shared in June 2022, since 2017, only twenty-three victims were saved, and five offenders were arrested out of twenty-seven thousand tips (Europol, 2022b). These figures also show that as recognizing OCSE-related items becomes more difficult for the public, the value of tips associated with the picture remains low. The diminishing value of tips for the LEAs thus increases the transaction cost of reaching high-value intelligence.

The low-value tips from the crowd also do not create a consumer surplus for the LEAs. Instead, they add a new workload for LEAs and policing departments have to allocate more financial resources to automated triage technologies (Online Interview_3). If the crowd knowledge does not create a significant consumer surplus for LEAs due to low-value tips, LEAs continue to invest in artificial intelligence (AI) and photo DNA technologies for data analysis to conduct their investigations (Online Interview_1 and Online Interview_2). The LEAs must continue paying licence fees to the private sector to obtain AI software and keep it updated to maintain the pace of innovation (Online Interview_3). So, in the absence of valuable public support, the role of crowdsourcing in lowering the transaction cost of gathering valuable intelligence remains insignificant.

Trust-building in the stop child abuse—trace an object platform

Trust is commonly defined as a firm belief in the reliability of someone or something (Oomsels and Bouckaert, 2012). It is an essential part of human relationships and the functioning of society. Trust allows individuals to rely on each other and work together towards common goals. Without trust, it would be difficult for people to form and maintain relationships, cooperate with others, or engage in transactions and exchanges (Choudhury, 2008). As online platforms frequently involve individuals sharing their personal assets or services with others, a high level of trust must exist between users for the platform to function properly (Ravenelle, 2019). There is a tied interdependence between online platform users, and without trust, they cannot maintain share of resources and goals (Renard and Davis, 2019). In crowdsourcing platforms, the crowdsourcer needs to ensure trust to motivate and convince the crowd to participate voluntarily in the problem-solving process (Blohm *et al.*, 2013; Liu *et al.*, 2016a; Garcia Martinez, 2017). However, building confidence between interacting parties is difficult on online platforms because of the absence of physical contact and uncertainties about who is behind the online profile (Benkler, 2004; Bratianu, 2018). In order to create a climate of trust in crowdsourcing platforms, two trust-building mechanisms prevail; clear guidelines and

communication mechanisms for constructive feedback (Karachiwalla and Pinkow, 2021).

Having a clear guideline is one of the necessary conditions to build trust between the crowd and the crowdsourcer. Crowdsourcing projects are open-call, and there is usually no contract between the crowd and the crowdsourcer. Without a contract, the crowdsourcer has little or no control over the crowd while acquiring knowledge (Kannangara and Uguccioni, 2013). Therefore, clear guidelines provided by the crowdsourcer can help the crowd develop solutions (Steils and Hanine, 2016) and understand how their solution is evaluated by the crowdsourcer (Afuah and Tucci, 2012). Clear guidelines, in that sense, encourage crowd participation (Blohm et al., 2018) and reduce the risk of low-quality problem solutions for the crowdsourcer (Liu et al., 2016a, b). Eliminating these uncertainties through clear guidelines helps to build trust between the crowd and the crowdsourcer.

A communication mechanism for feedback is the other trust-building mechanism in crowdsourcing. Its integration into the online platform has a crucial role in assuring trust between crowd and crowdsourcer and coordinating the efforts of a large number of people toward a common goal (Foss et al., 2016). As rational actors, individuals participating in the problem-solving process expect to receive appreciation for their contribution (Ye and Kankanhalli, 2017) or with altruistic motives to contribute to finding a solution to a problem (Garcia Martinez, 2017). The solvers who can easily communicate with crowdsourcer and receive constructive feedback about their task are more engaged in the problem-solving process and provide high-quality solutions (Blohm et al., 2013; Camacho et al., 2019; Chan et al., 2021). The feedback in this respect aims to nurture the efforts of community members as part of an ongoing information generation process (Chan et al., 2021). It is also more motivating when cultivating a culture of supportive social interactions and improving the social nature of a community (Joshi et al., 2010). The existence of a feedback-oriented communication mechanism, in that sense, builds trust between the crowd and crowdsourcer and motivates the crowd to develop more solutions in the future open calls (Blohm et al., 2013; Camacho et al., 2019).

The nature of OCSE cases is very sensitive to deal with. The public is generally reluctant to report these cases (Choo, 2009). Even if they want to provide information about the case, they want to be left out of the story, especially if the offender is a relative or someone who takes care of the children (Online Interview_2). Therefore, building trust between the crowd and LEAs is vital for efficient information gathering in crowdsourcing platforms.

In terms of providing clear guidelines, Europol's SCATO platform does not offer clear guidelines for the crowd, how their tips are collected, processed, stored, terminated and what will happen afterwards (Europol, 2022c). Even though a short notification replaced at the bottom of the webpage, which also refers to the European Parliament and Council Regulation on the protection of natural persons with regard to processing of personal data by the European institutions (Regulation 1725, 2018), such a short notification does not encourage crowd participation which has diverse knowledge on reading and understanding a legal document and having trust issues with LEAs (Choo, 2009). Therefore, a clear and straightforward guideline explaining to the crowd how their tips are utilized and how Europol and other LEAs evaluate their solution might encourage more crowd participation and build confidence, especially in some societies where a general distrust exists towards LEAs (Online Interview_3).

The communication mechanisms for feedback is another important mechanism for a crowdsourcing platform to foster trust and confidence between the crowd and the crowdsourcer (Muraszkiewicz, 2018). In the context of OCSE, feedback loops are a severe problem between LEAs and civilian partners. The reluctance of LEAs to provide feedback sometimes disincentivises civilians to report more (Online Interview_3). For an efficient crowdsourcing model, LEAs should provide feedback to the crowd on how the agencies have used their tips to enlighten a case or if it is not being used, then they should explain why no action is not taken (Myhill, 2006). Regarding feedback mechanisms, Europol shares statistical data with the public on its platform and social media accounts regarding its success (Europol, 2022a,c). Even though this feedback aims to show the crowd's positive impact, comparatively

Table 1 : Summary of analysis

Stop child abuse—trace an object		
Sharing Economy—Crowdsourcing		
Low barrier accessibility	Transaction cost	Trust-building mechanisms
+	–	–
• Easy Online Accessibility • User-Friendly Website • Cross-posting in multiple social media channels and other platforms	• Low-Quality and High-Volume Tips • More Resource Allocation • Lack of Consumer Surplus	• Lack of Clear Guidelines • Discouraging feedback mechanism

low success rates show another reality: the majority of tips provided by the crowd are not helpful and are not being used (Online Interview_3). In response to Europol's social media sharing, the critical comments on social media posts show that numbers are not promising (Europol, 2022a,b). In this respect, for better communication with the crowd and to provide constructive feedback, statistical data should be accompanied by successful operation stories where victims are saved (Online Interview_3). The feedback combining statistical data and case studies can potentially drive a behavioural and cultural change in the crowd. Even though 99% of these tips were not helpful, 1% still helped save children (Online Interview_3).

Conclusion

This article has shown that Europol's SCATO platform has all the main characteristics of a crowdsourcing platform. There is an online platform where the public (crowd) and Europol (crowdsourcer) interact. Identifying the local information associated with the victim, crime scene, and the offender is a simple task for the crowd that ultimately helps Europol rescue OCSE victims and offenders. However, when the most prominent sharing economy variables are employed, the crowdsourcing model utilized in the SCATO platform needs further development for efficient open-intelligence gathering (see Table 1).

The most important strength of the platform is that it provides easy accessibility to the worldwide crowd as far as they have an internet connection. Cross-posting the platform content from social

media platforms and other platforms aiming to tackle OCSE improves the visibility of the SCATO to a global audience. For a low barrier entry to the problem-solving process, Europol also requires only the email address of the informant and the tip associated with the picture shared on the platform.

On the other hand, the role of the SCATO platform in reducing the transaction cost of open-intelligence gathering is debatable. One of the biggest problems that cause low-value tips is that item pictures shared on the platform do not spark an easy recognition in public. Europol rightly refrains from sharing much detail in the pictures not to reveal the victim's identity and jeopardize ongoing police investigations. However, an item picture isolated from the surrounding environment can potentially cause low-quality tips received by Europol. These low-quality tips increase LEAs' workload, but they do not generate a consumer surplus for policing agencies. As a result, the LEAs must allocate more human and technical resources to tackle the workload of low-quality open-intelligence analysis.

Similarly, trust-building mechanisms between the crowd and Europol to encourage public participation and high-quality problem solution is also not promising. The current guideline does not address how crowd tips are collected, processed, shared, stored, and terminated. In the absence of straightforward and easy-to-understand guidelines, building confidence between crowd and LEAs is not easy, especially in OCSE cases where the public is generally reluctant to report cases not only because of the sensitivity of the crime but also potential distrust towards the LEAs. In terms of providing feedback, only sharing statistical data indicating the

platform's low success rate can discourage crowd participation and cause an unfair criticism towards Europol despite the effort dealing with vast volumes of OSCE materials and tips.

Based on the current inefficiencies in the SCATO platform, there are a few solutions Europol authorities may consider to improve their existing crowdsourcing strategy. First, to receive high-quality tips, Europol can use computer-generated pictures to represent the surrounding space of the item without compromising the victim's anonymity (Online Interview_3). In this regard, simulating a crime scene can inspire the crowd's sense of place and time, allowing them to recognize a key object and its natural location. Second, clear and simple guidelines are vital to encourage crowd participation to build confidence in the crowdsourcing platform. Third, for a better feedback mechanism, apart from transparent statistical data, the SCATO platform should share success stories in the same space showing the crowd how their tips are essential to save victims and arrest offenders, despite the low success rates.

This article was the first attempt to examine Europol's SCATO platform through the crowdsourcing concept. A similar multi-disciplinary perspective can also be pursued by investigating other crowdsourcing platforms that tackle OCSE, other crime fields or different e-governance platforms. The conceptual framework presented in the article can lead other researchers to follow the same conceptual pattern or modify the existing variables for better conceptualization. Furthermore, despite many efforts to recruit more interviewees during the data collection stage, the number of research participants was not at the desired level. Based on this unavoidable limitation, future studies can enrich the systematic analysis by adding more diverse empirical data.

Funding

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Interviews

Online Interview_1, 29 April 2022, Senior European Law Enforcement Agency Official Responsible for Prevention of Online Child Sexual Exploitation.

Online Interview_2, 06 June 2022, Senior Ministry of Interior Official Responsible for Prevention of Online Child Sexual Exploitation.

Online Interview_3, 21 June 2022, Executive Director of a Policy Oriented Non-Governmental Organisation Aiming to Prevent Online Child Sexual Exploitation.