

DOI:

<https://doi.org/10.33327/AJEE-18-9.2-a000185>

Date of submission: 5 Jan 2026

Date of acceptance: 7 Feb 2026

Online First Publication: 10 March 2026

Last Publication: 20 May 2026

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Research Article

BIG DATA-DRIVEN PREDICTIVE POLICING: GLOBAL PRACTICES AND LESSONS FOR ASEAN COUNTRIES

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ABSTRACT

Background: *The use of big data and algorithmic tools has become increasingly common in law enforcement. One notable development is Big Data-Driven Predictive Policing (BDPP), which seeks to predict where crime may occur or who may be involved by analysing large datasets. Although prediction has long been part of policing, BDPP differs in scale and automation, relying on advanced analytics and machine learning. While many police agencies view BDPP as a way to improve efficiency and move towards preventive policing, its use has raised important legal and social concerns. Issues such as transparency, data bias, accountability, and the protection of fundamental rights remain unresolved, particularly in ASEAN countries, where legal frameworks for algorithmic policing are still developing.*

Method: *This article is based on a qualitative literature review of academic studies, criminological research, and policy documents on predictive policing. It examines how BDPP operates in practice, with attention to both place-based and person-based models. Selected experiences from the United States, the Netherlands, and the United Kingdom are reviewed*

to assess the reported effectiveness of predictive policing, as well as its practical limitations and associated problems. Drawing on these findings, the article identifies lessons relevant to ASEAN countries considering adopting similar approaches.

Results and Conclusions: The article shows that while BDPP offers potential to enhance law enforcement efficiency and proactive resource allocation, global evidence from the US and Europe indicates mixed effectiveness and substantial risks related to algorithmic bias, transparency, and fundamental rights. For ASEAN countries, where institutional capacity and data protection regimes differ significantly, cautious and phased adoption is advisable. Priority should be given to controlled, place-based pilot projects, supported by clear legal mandates, data governance standards, independent review, and sustained human oversight.

1 INTRODUCTION

The rapid growth of big data technologies has transformed multiple fields, including the criminal justice system.¹ Across the world, law enforcement agencies are moving towards the use of data analysis to anticipate and prevent crime. Among these innovations, Big Data-Driven Predictive Policing (BDPP) has gained significant attention. Although predictive techniques such as crime mapping² and offender profiling³ have existed for decades, predictive policing represents a new generation of crime prevention, one shaped by the technological capabilities of the Big Data era. BDPP combines large-scale data analytics with algorithmic tools. These systems identify crime patterns and estimate the locations and time periods in which offences are more likely to occur and, in some cases, assess individuals who may be linked to future criminal activity.⁴ From the United States to the European Union, BDPP has become a central element in modern policing strategies, reflecting the global trend towards evidence-based, technology-supported public security management.

- 1 Elizabeth E Joh, 'Policing by Numbers: Big Data and the Fourth Amendment' (2014) 89(1) Washington Law Review 35; Samuel Fosso Wamba and others, 'How "Big Data" Can Make Big Impact: Findings from a Systematic Review and a Longitudinal Case Study' (2015) 165 International Journal of Production Economics 234, doi:10.1016/j.ijpe.2014.12.031; Greg Ridgeway, 'Policing in the Era of Big Data' (2018) 1 Annual Reviews of Criminology 401, doi:10.1146/annurev-criminol-062217-114209.
- 2 Jerry Ratcliffe, 'Crime Mapping: Spatial and Temporal Challenges' in Alex R Piquero and David Weisburd (eds), *Handbook of Quantitative Criminology* (Springer 2010) 5, doi:10.1007/978-0-387-77650-7_2; Spencer Chainey and Jerry Ratcliffe, *GIS and Crime Mapping* (John Wiley & Sons 2013); Rachel Boba Santos, *Crime Analysis with Crime Mapping* (SAGE Publications 2016).
- 3 Peter B Ainsworth, *Offender Profiling and Crime Analysis* (Willan 2001) doi:10.4324/9781843924630; Brent E Turvey, *Criminal Profiling: An Introduction to Behavioral Evidence Analysis* (Academic Press 2011).
- 4 Craig D Uchida, 'A National Discussion on Predictive Policing: Defining Our Terms and Mapping Successful Implementation Strategies' (*National Institute of Justice*, 1 November 2009) NCJ 230404 <<https://nij.ojp.gov/library/publications/national-discussion-predictive-policing-defining-our-terms-and-mapping>> accessed 2 October 2025; Walt L Perry and others, *Predictive Policing: The Role of Crime Forecasting in Law Enforcement Operations* (Rand Corporation 2013).

In the ASEAN region, interest in predictive analytics for policing and public safety is growing,⁵ although levels of technological readiness and regulatory development differ significantly among Member States. Some countries possess advanced digital infrastructure and established data protection regimes, while others are still consolidating basic data governance systems. At the same time, predictive policing remains a contested innovation. While it offers the potential to enhance efficiency, optimise resource allocation, and enable more proactive intervention, it also introduces complex challenges. Concerns about transparency, fairness, accountability, and the protection of fundamental rights underscore the need for cautious and context-sensitive adoption. This article addresses two specific research questions: (1) What are the practical effectiveness, limitations, and risks of BDPP systems as evidenced by global experience? (2) How can ASEAN countries adopt BDPP in ways that align with regional institutional capacities, legal traditions, and human rights standards, while avoiding the pitfalls observed elsewhere? This article seeks to inform policymakers and legislators by synthesising global evidence and proposing context-sensitive pathways for ASEAN adoption.

2 METHODOLOGY

This article adopts a qualitative legal-criminological approach, combining doctrinal legal analysis with a comparative and policy-oriented review. It examines relevant legislation, policy documents, judicial decisions, and academic literature on big-data-driven predictive policing to clarify key concepts, operational models, and their legal implications. The analysis covers both place-based and person-based predictive policing systems, drawing on illustrative examples from the United States, the Netherlands, and the United Kingdom,

- 5 Jonard Asor and others, 'Building Model for Crime Pattern Analysis Through Machine Learning Using Predictive Analytics' (2022) 2(1) *International Journal of Science, Technology, Engineering and Mathematics* 61; Hind Rashed Saleh Al Shamsi and Su'aidi Safei, 'Artificial Intelligence Adoption in Predictive Policing to Predict Crime Mitigation Performance' (2023) 14(3) *International Journal of Sustainable Construction Engineering and Technology* 289; Novia Sucita, Surya Nita and Chairul Muriman, 'Predictive Policing by Bhabinkamtibmas as a Solution to Address Criminality in Cilempung Village, Pasirjaya, Karawang' (2024) 4(10) *International Journal of Social Service and Research* 1, doi:10.46799/ijssr.v4i10.1048; Rere Cika Ihza Pamesti and Hsu Min Hsi, 'Applicability of Predictive Policing in Indonesia Police Agency' (2024) 27(1) *Jurnal Litbang Polri* 1, doi:10.46976/litbangpolri.v27i1.234; Ng Zhi Yong, Kua Choon Jin and Rozita Anwar, 'Renewing a Criminal Intelligence Analyst's Value Proposition in the Digital Age - the Singapore Experience' (2025) 2(1) *International Journal of Contemporary* 60, doi:10.3316/informit.T20250206 00018190413636180; Phirapat Mangkhalasiri and Krisanaphong Poothakool, 'Data Science in Policing in Thailand: Challenges and Future Directions - A Review From International Perspectives' (2025) 12(2) *Rangsit Journal of Social Sciences and Humanities* 18, doi:10.59796/jcsh.v12i2.18-34; Thanh Hà, 'Research on the Application of AI in Preventing and Responding to Non-Traditional Security Threats' *Báo điện tử Tiền Phong* (Hà Nội, 19 September 2025) [in Vietnamese] <<https://tienphong.vn/nghien-cuu-ung-dung-ai-trong-phong-ngua-ung-pho-voi-cac-de-doa-an-ninh-phi-truyen-thong-post1779329.tpo>> accessed 16 October 2025.

chosen for their early adoption of predictive policing and the availability of documented legal and policy responses. Existing evaluations, research studies, and official reports are also reviewed to assess the claimed effectiveness of BDPP and identify recurring concerns regarding data quality, algorithmic bias, transparency, and fundamental rights. On this basis, the article develops normative and policy-oriented conclusions, with particular attention to the conditions under which BDPP may be cautiously considered in ASEAN countries, emphasising the need for legal safeguards, sound data governance, and meaningful human oversight.

3 AN OVERVIEW OF BIG DATA-DRIVEN PREDICTIVE POLICING

3.1. Definition and Conceptual Foundations

Police have traditionally identified high-risk places and individuals to disrupt recurring patterns of crime. Predictive policing thus represents a change in the means of prediction rather than the underlying policing logic.⁶

In technological terms, big data refers to “massive, complex datasets”, characterised by high volume, variety, and velocity.⁷ Simply put, they comprise extensive observations and multiple data variables, the overall scope differing across specific uses. From a legal perspective, however, the concept extends beyond those technical features to emphasise how this “vast, fast, disparate, and digital” information is collected, processed by algorithms, and used within the legal system.⁸

Although the size and complexity of big data make analysis challenging and time-consuming, it can offer further understanding of future trends and recurring patterns.⁹ The use of advanced statistical and computational methods to generate such understanding is commonly described as predictive analysis.¹⁰ When these analytical techniques are applied to historical crime data to forecast future offences, they give rise to what is now termed

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- 6 Andrew G Ferguson, ‘Policing Predictive Policing’ (2017) 94(5) *Washington University Law Review* 1109.
 - 7 Seref Sagiroglu and Duygu Sinanc, ‘Big Data: A Review’ (2013 International Conference on Collaboration Technologies and Systems (CTS), 20-24 May 2013) doi:10.1109/CTS.2013.6567202; Din J Wasem, *Mining of Massive Datasets* (CreateSpace Independent Publishing 2014); Andrea De Mauro, Marco Greco and Michele Grimaldi, ‘A Formal Definition of Big Data Based on Its Essential Features’ (2016) 65(3) *Library Review* 122, doi:10.1108/LR-06-2015-0061.
 - 8 Sarah Brayne, ‘Big Data Surveillance: The Case of Policing’ (2017) 82(5) *American Sociological Review* 977, doi:10.1177/0003122417725865; Ridgeway (n 1).
 - 9 Wim Hardyns and Anneleen Rummens, ‘Predictive Policing as a New Tool for Law Enforcement? Recent Developments and Challenges’ (2018) 24 *European Journal on Criminal Policy and Research* 201, doi:10.1007/s10610-017-9361-2.
 - 10 Colleen McCue, *Data Mining and Predictive Analysis: Intelligence Gathering and Crime Analysis* (2nd edn, Elsevier 2015) doi:10.1016/C2013-0-00434-3; John D Kelleher, Brian Mac Namee and Aoife D’Arcy, *Fundamentals of Machine Learning for Predictive Data Analytics, Second Edition: Algorithms, Worked Examples, and Case Studies* (2nd edn, MIT Press 2020).

“predictive policing”. Craig Uchida provides one of the earliest and widely cited definitions of predictive policing, describing it as a policing approach that relies on information and advanced analytical techniques to support anticipatory crime prevention and proactive decision-making.¹¹ Walt Perry provides a broader, person-based definition of predictive policing, describing it as the use of analytical, especially quantitative, methods to generate statistical forecasts that guide police intervention aimed at preventing crime or supporting the investigation of offences.¹² Based on these different but complementary notions of BDPP, we propose the following definition: *Big data-driven predictive policing is the collection and algorithmic analysis of multiple, large datasets on crimes and related factors to identify and statistically predict individuals or geospatial areas with a higher probability of criminal activity, thereby informing policing strategies and prevention tactics.*

Three core features characterise BDPP in theory and practice. *Firstly*, it utilises data from multiple large datasets. As a “creature of the world of Big Data”¹³, BDPP depends on the collection and ingestion of information from multiple and continuously updated datasets to enhance predictive accuracy. These typically include crime history variables, time-dependent variables, opportunity and precursor crimes.¹⁴ Much of this information is derived from official repositories, including police databases and census records, but increasingly it is also supplemented by mass surveillance technologies such as automatic licence plate readers, facial recognition systems, and closed-circuit television.¹⁵ *Secondly*, it is based on, or initiated by, predictive algorithmic analysis. Central to BDPP is the use of intelligence models, geospatial analysis tools, data analysis tools, and advanced techniques such as machine learning and deep learning, which identify patterns and correlations across vast and massive datasets.¹⁶ *Lastly*, the results are used to guide responses to anticipated criminal behaviour. Predictive policing mainly aims to produce forecasts about crime trends and recurring patterns, which can then be used to inform planning, resource allocation, and preventive interventions.¹⁷ Over time, the broader aim is to support crime prevention by helping police identify risks earlier and to respond more effectively.¹⁸

11 Uchida (n 4).

12 Perry and others (n 4).

13 Andrew D Selbst, ‘Disparate Impact in Big Data Policing’ (2018) 52 *Georgia Law Review* 109, doi:10.2139/ssrn.2819182.

14 Hardyns and Rummens (n 9).

15 Jiang Su, ‘The Use of Big Data in Criminal Justice and Its Challenges’ (2023) 11(1) *Peking University Law Journal* 105, doi:10.1080/20517483.2023.2223851.

16 Amar Shukla et al., ‘Criminal Combat: Crime Analysis and Prediction Using Machine Learning’ (2021 International Conference on Intelligent Technologies (CONIT), 25-27 June 2021) doi:10.1109/CONIT51480.2021.9498397; Paria Sarzaeim and others, ‘A Systematic Review of Using Machine Learning and Natural Language Processing in Smart Policing’ (2023) 12 *Computers* 255, doi:10.3390/computers12120255; Hardyns and Rummens (n 9).

17 Jennifer Bachner, ‘Predictive Policing: Preventing Crime with Data and Analytics’ (Improving Performance Series, IBM Center for The Business of Government 2013); Lyria Bennett Moses and Janet Chan, ‘Algorithmic Prediction in Policing: Assumptions, Evaluation, and Accountability’ (2018) 28(7) *Policing and Society* 806, doi:10.1080/10439463.2016.1253695; McCue (n 10); Perry and others (n 4).

18 Hardyns and Rummens (n 9).

3.2. Classification of BDPP Models

Scholars have proposed several ways to classify BDPP. These include: (i) classifications based on *analytic techniques*, such as hot-spot mapping, data mining, and social network analysis;¹⁹ (ii) classifications by *methodology*, including spatial (place-focused), spatio-temporal (analysing patterns across space and time), and social network (to detect persons of interest);²⁰ (iii) from an *evolutionary* perspective, predictive policing can be divided into three stages: early models aimed at forecasting property crime hotspots, later models designed to address violent crime locations, and more recent models that shift attention toward individuals connected with criminal activity.²¹ The most widely discussed classification, however, distinguishes BDPP according to the *prediction target*: place-based models, which aim to forecast the future occurrence of crime in particular areas, and person-based models, which focus on predicting an individual's future behaviour.²²

Place-based BDPP aim to forecast high-risk locations and times for criminal activity. They typically analyse historical incident data to identify emerging hot spots or patterns.²³ Many early BDPP implementations were place-based; indeed, Predictive Policing 1.0 and 2.0 were designed to target locations (initially property crime areas, later violent crime areas).²⁴ Operationally, location-based predictions allow police to optimise patrol deployment and preventive presence in vulnerable areas.

Person-based BDPP, in contrast, attempts to identify individuals (or groups) at high risk of future criminal involvement using diverse datasets (e.g., prior arrests, social associations, social media activity, etc.). Person-based prediction has been extensively studied in related fields, such as recidivism research and terrorism studies. These models are often subdivided into (a) suspect-based and (b) threat-assessment-based systems,²⁵ or into (a) offender-focused, (b) perpetrator-identification, and (c) victim-prediction models.²⁶ In practice, the police may deter offending through direct

19 Uchida (n 4).

20 Bachner (n 17).

21 Ferguson (n 6).

22 Dylan J Fitzpatrick, Wilpen L Gorr, and Daniel B Neill, 'Keeping Score: Predictive Analytics in Policing' (2019) 2 *Annual Review of Criminology* 473, doi:10.1146/annurev-criminol-011518-024534; Ferguson (n 6); Youngsub Lee, Ben Bradford and Krisztian Posch, 'The Effectiveness of Big Data-Driven Predictive Policing: Systematic Review' (2024) 7(2) *Justice Evaluation Journal* 127, doi:10.1080/24751979.2024.2371781.

23 Mareile Kaufmann, Simon Egbert, and Matthias Leese, 'Predictive Policing and the Politics of Patterns' (2019) 59(3) *The British Journal of Criminology* 674, doi:10.1093/bjc/azy060; GO Mohler and others, 'Randomized Controlled Field Trials of Predictive Policing' (2015) 110(512) *Journal of the American Statistical Association* 1399, doi:10.1080/01621459.2015.1077710.

24 Ferguson (n 6).

25 Selbst (n 13).

26 Perry and others (n 4).

engagement, prioritise arrest to prevent further offences, and adopt public health approaches that address underlying needs through social services.²⁷

4 GLOBAL PRACTICES OF BIG DATA-DRIVEN PREDICTIVE POLICING

4.1. Implementation of Big Data-Driven Predictive Policing in Practice

The core idea behind BDPP is that law enforcement agencies can use large-scale data analytics to guide resource allocation and use in day-to-day operations. By transforming raw information into practical insights, BDPP helps improve both the accuracy and timing of police decision-making. The potential benefits of BDPP can be viewed from two main perspectives:

a) Place-Based Predictive Policing

Building on the near-repeat crime assumption, the theory that offences tend to recur within a short period and nearby area after a recent incident²⁸, many BDPP models, such as advanced hot-spot mapping and risk terrain analysis, allow police to plan and deploy resources with greater precision. By using predictive algorithms and data integration, officers can identify “hot spots” where crimes are statistically more likely to occur and forecast when such events are most probable.²⁹ This data-driven approach enables more efficient use of limited patrol forces by focusing attention on areas and times of higher risk. By shifting policing strategies from reactive responses to proactive prevention, targeted deployment not only strengthens deterrence but also improves response times, enabling the prevention or quick interruption of criminal activity. Ultimately, BDPP moves policing away from responding to crime after it occurs and towards earlier, preventive intervention.

One illustration of this model is the Crime Anticipation System (CAS), a predictive policing initiative developed in the Netherlands to identify likely crime locations. After its nationwide introduction in 2019, the Netherlands became the first country to implement predictive policing on a countrywide basis.³⁰ CAS draws on historical data covering around 200 variables related to demographics, socio-economic conditions, and crime opportunities, obtained from the Central Crime Database, the Municipal Administration,

27 Daniel Marciniak, 'Algorithmic Policing: An Exploratory Study of the Algorithmically Mediated Construction of Individual Risk in a UK Police Force' (2023) 33(4) *Policing and Society* 449, doi:10.1080/10439463.2022.2144305.

28 Perry and others (n 4).

29 Albert Meijer and Martijn Wessels, 'Predictive Policing: Review of Benefits and Drawbacks' (2019) 42(12) *International Journal of Public Administration* 1031, doi:10.1080/01900692.2019.1575664; Perry and others (n 4).

30 Litska Strikwerda, 'Predictive Policing: The Risks Associated with Risk Assessment' (2021) 94(3) *The Police Journal: Theory, Practice and Principles* 422, doi:10.1177/0032258X20947749.

and Statistics Netherlands.³¹ It generates forecasts through a “heat map” divided into 125-by-125-meter grid squares, assigning each a risk score for the upcoming two weeks. Between October 2013 and July 2014, CAS correctly predicted 15% of residential burglaries in Amsterdam and nearly predicted another 36% (where the predicted location was adjacent to the actual crime site). For muggings, CAS predicted 33% of incidents correctly and nearly 57% accurately.³² However, CAS’s actual impact on reducing crime rates remains unclear. Because CAS focuses on locations, it is best suited to predicting crimes that occur in specific physical spaces, such as burglary, pickpocketing, and mugging, etc. and not for offences such as fraud. Another limitation involves crimes that are rare (e.g., murder) or underreported (e.g., sexual assault or drug-related offences), which cannot be predicted accurately by a spatio-temporal model.³³

The United States was an early adopter of predictive policing technologies. Geolitica, known as PredPol until its 2021 rebrand, was developed in 2011 for the Los Angeles Police Department in collaboration with the University of California, Los Angeles. As a commercial product, the system is promoted as a ready-to-use solution that allows law enforcement agencies to deploy predictive tools with minimal additional technological or training requirements. PredPol’s mathematical model, adapted from earthquake aftershock prediction, relies on three variables: time, location, and crime type. Its predictions are displayed on a map divided into 500 ft. by 500 ft. grid cells.³⁴ Following earlier experiences with hotspot models, HunchLab was developed for the Philadelphia Police Department and the U.S. Attorney’s Office in cooperation with Temple University and Rutgers University.³⁵ Unlike PredPol, HunchLab analyses hundreds of variables through machine learning, training and testing, and the data to produce forecasts that help plan police patrols more effectively. Early testing in Chicago and Philadelphia showed promising results in reducing crime, although findings have not yet been published in peer-reviewed journals.³⁶ In recent years, SoundThinking (formerly ShotSpotter), a leader in gunshot detection technology, acquired parts of Geolitica (formerly PredPol) and HunchLab, merging them into a new product called ResourceRouter. ResourceRouter integrates location-based crime data with external risk-terrain data to

31 Serena Oosterloo and Gerwin van Schie, ‘The Politics and Biases of the “Crime Anticipation System” of the Dutch Police’ (BIAS 2018 Bias in Information, Algorithms, and Systems, Sheffield, UK, 25 March 2018) vol 2103, 30 <<https://ceur-ws.org/Vol-2103/>> accessed 9 October 2025.

32 Jitske Sanne De Graauw, ‘Tijdruimtelijk Voorspellen van Criminele Incidenten’ (Master thesis, Vrije Universiteit Amsterdam 2014).

33 Oosterloo and van Schie (n 31).

34 Bachner (n 17); GO Mohler and others, ‘Self-Exciting Point Process Modeling of Crime’ (2011) 106(493) *Journal of the American Statistical Association* 100, doi:10.1198/jasa.2011.ap09546; Perry and others (n 4).

35 Azavea, ‘HunchLab: Under the Hood’ (*HunchLab*, 2015) <<https://blog.pilpul.me/files/2015/09/HunchLab-Under-the-Hood.pdf>> accessed 23 October 2025.

36 Andrew Guthrie Ferguson, ‘Predictive Policing Theory’ in Tamara Rice Lave and Eric J Miller (eds), *The Cambridge Handbook of Policing in the United States* (CUP 2019) 491, doi:10.1017/9781108354721.025.

generate patrol plans targeting areas of highest risk and need.³⁷ Currently, no peer-reviewed, evidence-based studies confirm its effectiveness. In a 2024 report from the Worcester Police Department, Interim Police Chief Paul B. Saucier stated that “ResourceRouter is not expected to result in arrests or major changes to our emergency response. Instead, it enhances our community policing foot beat efforts by directing officers to areas of their route where their presence is most likely to reassure residents and deter crime”.³⁸

b) Person-Based Predictive Policing

Another important application of BDPP is identifying individuals assessed as at risk of future involvement in criminal activity, whether as potential offenders or victims. These person-based systems, which focus on individual-level data, have been developed in several countries, although they vary considerably in purpose, methodology, and legal acceptance.

In the Netherlands, the System Risk Indication (SyRI) was a notable example of person-based predictive policing designed to identify potential offenders. The Dutch authorities introduced the system as a tool to prevent and detect fraud in areas such as welfare benefits, income-based schemes, taxation, and compliance with labour law. The system integrated data from multiple sources, including employment records, debt information, civic integration data, health insurance status, and standard personal information such as name, residential address, and date of birth. However, in early 2020, the District Court of The Hague ruled that SyRI violated Article 8 of the European Convention on Human Rights (ECHR), which protects the right to privacy. Consequently, the system was suspended and is no longer in use.³⁹

One of the earliest person-focused predictive policing initiatives in the United States was the Party to Violence (PTV) program, launched in 2012 by the Chicago Police Department together with the Illinois Institute of Technology. The initiative consisted of a series of risk assessment models, beginning with five versions of the Strategic Subject List (SSL) and later extended by the Crime and Victimization Risk Model (CVRM). The SSL generated numerical risk scores for individuals, whereas the CVRM classified individuals into ordered risk tiers, indicating a higher probability of involvement in a shooting, either as a victim or as an offender, within eighteen months.⁴⁰ These models analysed demographic information, arrest histories, and social network data, including co-arrest patterns with previous victims,

37 ‘ResourceRouter’ (*SoundThinking*, 2025) <<https://www.soundthinking.com/law-enforcement/resource-deployment-resourcerouter/>> accessed 9 October 2025.

38 Paul B Saucier, *Report Concerning the ShotSpotter and ResourceRouter Programs* (City of Worcester Police Department 2024).

39 Case C-09-550982-HA ZA 18-388 (Rechtbank Den Haag, 5 February 2020) ECLI:NL:RBDHA:2020:865.

40 Joseph M Ferguson, *Advisory Concerning the Chicago Police Department’s Predictive Risk Models: Report of the Public Safety Section of the Office of Inspector General* (City of Chicago, Office of Inspector General 2020); Stella Cheng, ‘Predictive Policing in Practice: A Case Study of Chicago’s Strategic Subject List’ (Senior Thesis, Claremont McKenna College 2025) 2.

to predict potential offenders and victims. Each individual identified on the SSL received a personalised “custom notification” letter delivered by police officers, explaining the factors contributing to their inclusion on the list. The letter also served as a formal warning that continued involvement in gun violence would attract heightened law enforcement attention and potential legal consequences.⁴¹

Across Europe, person-based predictive policing most commonly takes the form of risk modelling, in which individuals are assessed and prioritised based on their estimated probability of future criminal or violent behaviour.⁴² In the United Kingdom, several police forces have implemented predictive policing initiatives, including those in Durham, London, Avon and Somerset, and the West Midlands.⁴³ One of the most notable examples is the Harm Assessment Risk Tool (HART), developed jointly by the Durham Constabulary and researchers from the University of Cambridge. Using machine-learning techniques, HART estimates an individual’s likelihood of reoffending over two years. The system categorises individuals as high-, medium-, or low-risk.⁴⁴ Those identified as moderate risk may be directed to the Checkpoint Programme,⁴⁵ a diversion initiative aimed at rehabilitation and the reduction of reoffending rates. Another program is the National Data Analytics Solution (NDAS), led by the West Midlands Police in collaboration with eight other police forces.⁴⁶ NDAS combines artificial intelligence and statistical modelling to evaluate the probability that an individual may either commit or experience gun- or knife-related crime, as well as the potential for victimisation related to modern slavery.⁴⁷

Existing evaluation and assessment studies provide only limited and mixed evidence regarding the effectiveness of BDPP. Among the available studies, only a few have tested predictive algorithms in real-world policing settings; most have been retrospective analyses

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- 41 Kelly Koss, ‘Leveraging Predictive Policing Algorithms to Restore Fourth Amendment Protections in High-Crime Areas in a Post-Wardlow World’ (2015) 90(1) *Chic-Kent Law Review* 301.
 - 42 Fieke Jansen, *Data Driven Policing in the Context of Europe* (ERC-funded project Data Justice Working Paper, Data Justice Lab 2018).
 - 43 Hannah Couchman, ‘Policing by Machine: Predictive Policing and the Threats to Our Rights Liberty’ (*Liberty*, 1 February 2019) <<https://www.libertyhumanrights.org.uk/issue/policing-by-machine/>> accessed 10 October 2025; ‘Trapped in the Matrix: Secrecy, Stigma, and Bias in the Met’s Gangs Database’ (*Amnesty International*, 23 May 2018) <<https://www.amnesty.org.uk/knowledge-hub/all-resources/london-trident-gangs-matrix-metropolitan-police/>> accessed 10 October 2025.
 - 44 Marion Oswald and others, ‘Algorithmic Risk Assessment Policing Models: Lessons from the Durham HART Model and “Experimental” Proportionality’ (2018) 27(2) *Information & Communications Technology Law* 223, doi:10.1080/13600834.2018.1458455.
 - 45 *ibid*; Couchman (n 43).
 - 46 ‘National Data Analytics Solution – Violent Crime’ (*West Midlands Police & Crime Commissioner*, 3 November 2021) <<https://www.westmidlands-pcc.gov.uk/wp-content/uploads/2022/01/2021-11-03-EC-Agenda-Item-2.1-NDAS-VC-National-Data-Analytics-Solution.pdf>> accessed 10 October 2025.
 - 47 Chris Baraniuk, ‘Exclusive: UK Police Wants AI to Stop Violent Crime before It Happens’ (*New Scientist*, 26 November 2018) <<https://www.newscientist.com/article/2186512-exclusive-uk-police-wants-ai-to-stop-violent-crime-before-it-happens/>> accessed 11 October 2025; Jansen (n 42).

conducted after the fact.⁴⁸ While several studies show a significant positive effect for place-based predictive models,⁴⁹ others show no significant results.⁵⁰ Moreover, in most cases, the effectiveness of BDPP appears to depend on specific conditions, such as particular combinations of crime types, police strategies, and contextual factors. Only one study has examined profiling (person-based predictive policing) with ambiguous outcomes.⁵¹ These mixed findings may be explained by variations in evaluation design, differences in the type of predictive policing model, and the analytical methods used to generate predictions.⁵² Overall, the current body of research suggests that while BDPP shows potential under certain conditions, its broader reliability and general effectiveness remain uncertain.

4.2. Problems and Limitations

a) Transparency and Accountability

One of the most common criticisms of BDPP is the lack of transparency surrounding the algorithms that power predictive models, particularly those based on machine learning. This issue is often described as the “black box” problem, where the decision-making process of an algorithm is either proprietary or too complex to comprehend.⁵³

Compared with traditional statistical methods, machine-learning models tend to show stronger predictive performance when applied to complex and high-dimensional datasets.⁵⁴ The best-known example is the neural network, which learns patterns from data and adjusts itself through repeated training cycles.⁵⁵ However, its internal workings are often opaque, making it difficult to understand how input variables lead to specific predictions or

48 Lee, Bradford and Posch (n 22).

49 Anthony A Braga and Brenda J Bond, 'Policing Crime and Disorder Hot Spots: A Randomized Controlled Trial' (2008) 46(3) *Criminology* 577, doi:10.1111/j.1745-9125.2008.00124.x; Curtis Florence and others, 'Effectiveness of Anonymised Information Sharing and Use in Health Service, Police, and Local Government Partnership for Preventing Violence Related Injury: Experimental Study and Time Series Analysis' (2011) 342 *BMJ* d3313, doi:10.1136/bmj.d3313; Jeremy G Carter and others, 'The Indianapolis Harmspot Policing Experiment' (2021) 74 *Journal of Criminal Justice* 101814, doi:10.1016/j.jcrimjus.2021.101814; Jerry H Ratcliffe and others, 'The Philadelphia Predictive Policing Experiment' (2021) 17 *Journal of Experimental Criminology* 15, doi:10.1007/s11292-019-09400-2; Ferguson JM (n 40); Mohler and others, 'Randomized (n 23).

50 Priscillia Hunt, Jessica Saunders and John S Hollywood, *Evaluation of the Shreveport Predictive Policing Experiment* (Safety and Justice Program, RAND Corporation, 2014).

51 Jessica Saunders, Priscillia Hunt, and John S Hollywood, 'Predictions Put into Practice: A Quasi-Experimental Evaluation of Chicago's Predictive Policing Pilot' (2016) 12 *Journal of Experimental Criminology* 347, doi:10.1007/s11292-016-9272-0.

52 Lee, Bradford and Posch (n 22).

53 Cynthia Rudin, 'Stop Explaining Black Box Machine Learning Models for High Stakes Decisions and Use Interpretable Models Instead' (2019) 1(5) *Nature Machine Intelligence* 206, doi:10.1038/s42256-019-0048-x.

54 Simon Haykin, *Neural Networks and Learning Machines* (3rd edn, Prentice-Hall 2009).

55 Kevin Gurney, *An Introduction to Neural Networks* (CRC Press 2018) doi:10.1201/9781315273570.

outcomes.⁵⁶ As a result, unlike more conventional statistical approaches such as logistic regression, these models provide limited explanatory insight.⁵⁷ The problem is further complicated by the fact that many predictive policing models, particularly those developed by private technology companies, are proprietary.⁵⁸ Their algorithms and training data are protected as commercial secrets, preventing external examination or independent validation. Consequently, the public, and sometimes even police agencies themselves, cannot fully access or understand how predictions are generated.

When a predictive model labels a person or area as “high risk”, it may be unclear which specific factors led to that conclusion. This opacity makes it difficult to evaluate whether the predictions are fair, accurate, or lawful. It also raises problems of accountability, as neither developers, law enforcement officers, nor policymakers can clearly explain or defend how a given decision was reached.⁵⁹

b) Data Quality and Bias

Another major limitation of BDPP concerns the quality of data used to train and operate predictive systems. Because predictive technologies depend on large volumes of data, their performance is closely tied to how usable, accurate, and well-structured that data is. In practice, however, obtaining data that meets these standards is difficult, which exposes a key weakness in BDPP.⁶⁰ These models typically rely on existing sources such as crime records, personal data, and pattern-matching outputs.⁶¹ In policing contexts, the problem is further compounded by the fact that such datasets are often incomplete, outdated, or inaccurate - an issue commonly described as “dirty data”.⁶²

Within data science, dirty data is typically understood as data that is incomplete, inaccurate, or inconsistently formatted.⁶³ In policing, however, the concept has a broader

56 Vikas Hassija and others, ‘Interpreting Black-Box Models: A Review on Explainable Artificial Intelligence’ (2024) 16 *Cognitive Computation* 45, doi:10.1007/s12559-023-10179-8.

57 Hardyns and Rummens (n 9).

58 Louise Amore and V Piotukh, ‘Life beyond Big Data : Governing with Little Analytics’ (2015) 44(3) *Economy and Society* 341, doi:10.1080/03085147.2015.1043793; Julia Angwin and others, ‘Machine Bias’ (*ProPublica*, 23, May 2016) <<https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing>> accessed 13 October 2025; Rudin (n 53).

59 Moses and Chan (n 17).

60 Ferguson (n 6).

61 *ibid*; Harry Surden, ‘Machine Learning and Law’ (2014) 89(1) *Washington Law Review* 88.

62 Ferguson (n 6); Rashida Richardson, Jason M Schultz and Kate Crawford, ‘Dirty Data, Bad Predictions: How Civil Rights Violations Impact Police Data, Predictive Policing Systems, and Justice’ (2019) 94 *New York University Law Review Online* 15 <<https://nyulawreview.org/online-features/dirty-data-bad-predictions-how-civil-rights-violations-impact-police-data-predictive-policing-systems-and-justice/>> accessed 12 October 2025.

63 Won Kim and others, ‘A Taxonomy of Dirty Data’ (2003) 7 *Data Mining and Knowledge Discovery* 81, doi:10.1023/A:1021564703268.

meaning, as it may also reflect data produced through biased, corrupt, or unlawful practices. This may include records that have been intentionally manipulated, influenced by systemic or individual bias, or generated through false arrests, fabricated evidence, or misleading reports of criminal activity.⁶⁴ Because BDPP systems are built upon historical data, they inevitably reflect the patterns and biases of prior policing practices, often reinforcing pre-existing inequities.⁶⁵ When such biased or unreliable data are used as inputs, predictive algorithms tend to reproduce and amplify these distortions, leading to inaccurate or unfair outcomes. In practice, this can lead to increased surveillance and police contact with those scored as “high-risk”, potentially creating feedback loops of over-policing in marginalised communities.⁶⁶

Person-based models, such as Operation LASER used by the Los Angeles Police Department, create similar feedback loops in which police contact increases an individual's threat score, which, in turn, predicts future police contact. The program was discontinued in 2019, following findings that officers frequently failed to follow established procedures and disproportionately affected certain community members, including individuals with no prior arrest history.⁶⁷ Similarly, a related program in Pittsburgh was suspended in 2020 following concerns that it may have generated racially biased outcomes.⁶⁸

c) Societal Impacts

Although predictive policing is often presented as a tool to support crime prevention, its use can also raise serious societal concerns, particularly regarding civil liberties and privacy. Academic discussion frequently points to its implications for fundamental rights such as human dignity, the presumption of innocence, and the right to privacy.⁶⁹

64 Kristian Lum and William Isaac, 'To Predict and Serve?' (2016) 13(5) *Significance* 14, doi:10.1111/j.1740-9713.2016.00960.x; Ferguson (n 6); Richardson, Schultz and Crawford (n 62).

65 Ferguson (n 6); Joh (n 1); Richardson, Schultz and Crawford (n 62).

66 Lum and Isaac (n 64); Selbst (n 13).

67 Mark P Smith, 'Review of Selected Los Angeles Police Department Data-Driven Policing Strategies' (Los Angeles Police Commission, Office of the Inspector General 2019) <https://a27e0481-a3d0-44b8-8142-1376cfbb6e32.filesusr.com/ugd/b2dd23_21f6fe20f1b84c179abf440d4c049219.pdf> accessed 12 October 2025; Seumas Miller, 'Predictive Policing' in David Edmonds (ed), *Future Morality* (OUP 2021) 73, doi:10.1093/oso/9780198862086.003.0007.

68 Sabelli Martin and others, *Garbage In, Gospel Out: How Data-Driven Policing Technologies Entrench Historic Racism and “Tech-Wash” Bias in the Criminal Legal System* (National Association of Criminal Defense Lawyers 2021).

69 Linnet Taylor, 'On The Presumption Of Innocence in Data-Driven Government: Are We Asking the Right Question?' in Emre Bayamlioglu and others (eds), *BEING PROFILED: COGITAS ERGO SUM: 10 Years of Profiling the European Citizen* (Amsterdam UP 2019) doi:10.1515/9789048550180-014; Athina Sachoulidou, 'Going beyond the “Common Suspects”: To Be Presumed Innocent in the Era of Algorithms, Big Data and Artificial Intelligence' [2023] *Artificial Intelligence and Law*, doi:10.1007/s10506-023-09347-w; Sofia Söderholm, 'Fundamental Rights Control When Implementing Predictive Policing – a European Perspective' (2023) 11(1) *Peking University Law Journal* 91, doi:10.1080/20517483.2023.2223850.

In person-based systems, individuals may be identified as “high risk” based on statistical correlations rather than concrete evidence. This can result in increased police attention simply because someone fits certain profiles, for example, being unemployed or living in an area classified as “high risk”, even when the criteria used are not clearly defined.⁷⁰ Labelling individuals in this way risks undermining the presumption of innocence, which is a central principle of criminal justice.

These concerns are closely linked to the way predictive policing systems use data. Such systems often combine large amounts of personal information, surveillance footage, and social media activity. When combined, these data sources can create detailed profiles of individuals and communities. This raises concerns about whether individuals’ privacy is adequately protected and whether such extensive data use is permissible for law enforcement purposes. More broadly, the growing use of big data in policing has fuelled debates about the development of a “surveillance society” and about how data are collected, stored, and monitored by police and other state authorities.⁷¹

5 RECOMMENDATIONS FOR ASEAN COUNTRIES

5.1. ASEAN’S Institutional and Regulatory Landscape

The ten ASEAN Member States operate under different economic systems, legal frameworks, and institutional arrangements. The region includes highly digitalised jurisdictions with advanced technological infrastructure, such as Singapore, alongside lower- and middle-income countries where the digitisation of law enforcement remains uneven. Since the accession of Cambodia, Laos, Myanmar, and Vietnam in the late 1990s, ASEAN has recognised what is commonly described as the “developmental divide” between the more economically advanced members and the newer entrants.⁷² The Member States also follow different legal traditions, although in practice many systems are shaped by multiple historical influences. Cambodia, Indonesia, Laos, Thailand, and Vietnam are predominantly civil law jurisdictions; the common law tradition largely influences Brunei

70 Eva Schlehahn and others, ‘Benefits and Pitfalls of Predictive Policing’ 2015 European Intelligence and Security Informatics Conference (2015 European Intelligence and Security Informatics Conference, 7-9 September 2015) <<https://ieeexplore.ieee.org/document/7379738>> accessed 13 October 2025.

71 Brayne (n 8); MR McGuire, ‘The Laughing Policebot: Automation and the End of Policing’ (2021) 31(1) *Policing and Society* 20, doi:10.1080/10439463.2020.1810249; Shoshana Zuboff, ‘The Age of Surveillance Capitalism’ in Wesley Longhofer and Daniel Winchester (eds), *Social Theory Re-Wired* (3rd edn, Routledge 2023) 11.

72 Rodolfo C Severino, ‘The ASEAN Developmental Divide and the Initiative for ASEAN Integration’ (2007) 24(1) *ASEAN Economic Bulletin* 35.

Darussalam, Malaysia, Myanmar, and Singapore; The Philippines maintains a mixed system drawing from both civil and common law sources.⁷³

Regulation of artificial intelligence, data protection, and cybersecurity is uneven across ASEAN. Vietnam, Indonesia, Singapore, Malaysia, and Thailand have enacted data protection legislation and adopted national AI policies⁷⁴, while other Member States are still developing comprehensive data governance frameworks. Supervisory capacity also differs. Singapore, Malaysia, and Thailand have established data protection authorities with technical expertise. The Indonesian government has announced plans to finalise the establishment of a dedicated state agency for personal data protection this year⁷⁵. In Vietnam, data protection oversight is primarily exercised by the Cybersecurity and High-Tech Crime Prevention Department under the Ministry of Public Security, rather than by an independent data protection authority. Cambodia, Laos, and Myanmar do not currently maintain dedicated data protection institutions.

For these reasons, any approach to predictive policing in ASEAN must take account of national institutional capacity. Uniform regulatory standards across the region would not correspond to existing legal and administrative conditions.

5.2. Policy Framework for ASEAN BDPP Adoption

Drawing on global experience, ASEAN countries can benefit from adopting BDPP as part of their broader efforts to modernise law enforcement. However, its introduction must be guided by sound governance, legal safeguards, and contextual awareness to ensure that technological innovation supports justice, fairness, and public trust.

First, ASEAN countries should adopt a comprehensive and well-regulated approach to predictive policing. Predictive analytics should not be treated as a standalone solution but as one component of a broader, integrated crime prevention strategy⁷⁶ that complements

73 Joshua Kow, 'On Legal Harmonisation Within ASEAN' [2012] *The Singapore Law Review* <<http://www.singaporelawreview.com/juris-illuminae-entries/2015/on-legal-harmonisation-within-asean>> accessed 5 February 2026; Jason Odering, 'Southeast Asian Region Countries Law: Regional and Comparative Resources' (*University of Melbourne, Library*, 2020) <<https://unimelb.libguides.com/c.php?g=930183&p=6721948>> accessed 5 February 2026.

74 Vietnam Law No 91/2025/QH15 on Personal Data Protection 2025; Vietnam Law No 134/2025/QH15 on Artificial Intelligence 2025; Indonesia Law No 27 on Personal Data Protection 2022; Indonesia National Strategy for Artificial Intelligence 2020-2045; Malaysia Personal Data Protection Act 2010; Malaysia National Artificial Intelligence Roadmap 2021-2025; Thailand Personal Data Protection Act BE 2562 2019; Thailand's draft AI law 2025; Singapore Personal Data Protection Act 2012; Singapore National AI Strategy 2019.

75 'Indonesia to Establish Independent Personal Data Protection Agency' (*Antara News*, 4 February 2026) <<https://en.antaranews.com/news/402914/indonesia-to-establish-independent-personal-data-protection-agency>> accessed 5 February 2026.

76 Perry and others (n 4).

traditional approaches such as hotspot policing, problem-oriented policing and community-oriented policing⁷⁷. Before implementation, each country should establish a clear legal and ethical framework that defines the permissible scope of data collection, processing, and use. International experience, such as the suspension of the Dutch SyRI system,⁷⁸ shows that the absence of a defined legal foundation can lead to breaches of human rights. If SyRI violated human rights in a well-regulated European context, the risk in ASEAN jurisdictions with weaker safeguards is substantially greater. Therefore, ASEAN jurisdictions must establish detailed regulations governing data collection, processing, and sharing, particularly concerning personal information. These rules should comply with principles on privacy, human dignity, and the presumption of innocence, ensuring that predictive policing operates within clear ethical and legal boundaries. Given varying institutional capacity, ASEAN Member States may initially prioritise place-based predictive models, which generally pose lower risks to individual rights. Person-based models should only be considered where strong procedural safeguards and review mechanisms are in place.

Second, improving data governance and data quality while balancing technology with human oversight. The accuracy of predictive models depends on the quality and authenticity of their data inputs. Although artificial intelligence can process vast datasets and detect hidden patterns, it cannot understand social, economic, and cultural contexts that shape criminal behaviour. Across ASEAN, law enforcement data systems, such as national population registries, police databases, and immigration records, are still being standardised and interconnected and may contain inconsistencies or outdated records. As seen in the United States, “dirty data” and biased datasets can create feedback loops of over-policing, particularly in disadvantaged communities.⁷⁹ To mitigate such risks, human supervision is essential to review and question algorithmic outputs. Establishing clear standards for data validation and independent oversight mechanisms would help ensure that predictive models are built on fair, accurate data.

Third, the introduction of predictive policing should follow a gradual, pilot-based approach rather than a large-scale deployment. These pilot programs should include independent evaluations by academic institutions and civil society organisations to assess not only predictive accuracy but also the social and ethical implications. Promising examples are already evident across the region. In Singapore, the GRAND-VISION project, a research collaboration between the Singapore Police Force, Fujitsu, and Singapore Management University, applies deep learning to historical crime data (such as location, time of day, season, and weather conditions) to generate heat maps indicating where and when crimes are more likely to be committed. The system is designed to

77 Ferguson JM (n 40).

78 Case C-09-550982-HA ZA 18-388 (n 39).

79 Lum and Isaac (n 64); Martín and others (n 68).

support the targeted deployment of patrols and crime prevention resources.⁸⁰ In Vietnam, the project “AI-powered solution targeting social security risks among young citizens aged 13 to 25”, which won second prize at the 2024 Data for Life competition, is being supported by the National Population Data Center’s incubation program to refine its predictive model. Similarly, in Indonesia, the “Predictive Policing by Bhabinkamtibmas” initiative in Cilempung Village uses a predictive policing model adapted to local community conditions to enhance public safety.⁸¹ Such pilot initiatives could serve as controlled environments to improve algorithmic precision, verify data quality, and identify potential unintended consequences before wider implementation.

Finally, training and capacity building are essential. Police officers and policymakers must understand how predictive policing systems function, including advanced techniques such as machine learning and data analytics, and how to interpret algorithmic results critically. Training programs should include modules on data ethics, algorithmic literacy, and human rights, ensuring that technology is applied in a way that respects due process and public accountability. Regional cooperation through ASEAN mechanisms, such as the ASEANAPOL framework, can support the exchange of expertise, the development of shared ethical standards, and mutual learning among participating states.

6 CONCLUSIONS

Big data-driven predictive policing represents both a technological opportunity and a governance challenge for modern law enforcement. International experiences from the United States, the United Kingdom, and the Netherlands demonstrate that while BDPP can enhance efficiency and support proactive crime prevention, it also raises serious ethical, legal, and social concerns. For ASEAN countries, the responsible adoption of predictive policing requires a balanced approach, grounded in strong legal safeguards, reliable data governance, and human oversight. By learning from global practices and adapting them to national conditions, ASEAN countries can harness the benefits of BDPP while safeguarding human rights and public trust in its digital transformation of policing.

80 Jonathan Chase and others, ‘GRAND-VISION: An Intelligent System for Optimized Deployment Scheduling of Law Enforcement Agents’ (Proceedings of the 31st International Conference on Automated Planning and Scheduling ICAPS 2021, June 7-12) 459 <https://ink.library.smu.edu.sg/sis_research/5980> accessed 5 February 2026.

81 Sucita, Nita and Muriman (n 5).

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Competing interests: No competing interests were disclosed.

Disclaimer: The authors declare that their opinions and views expressed in this manuscript are free from any impact of any organisations.

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EDITORS

Managing Editor – Prof. Iryna Izarova. **English Editor** – Robert Reddin.

Ukrainian language Editor – Mag. Liliia Hartman.

ABOUT THIS ARTICLE

Cite this article

Vu TH, Do TP and Nguyen VKH, ‘Big Data-Driven Predictive Policing: Global Practices and Lessons for ASEAN Countries’ (2026) 9(2) Access to Justice in Eastern Europe 187-213 <<https://doi.org/10.33327/AJEE-18-9.2-a000185>>

DOI: <https://doi.org/10.33327/AJEE-18-9.2-a000185>

Summary: 1. Introduction. – 2. Methodology. – 3. An Overview of Big Data-Driven Predictive Policing. – 3.1. *Definition and Conceptual Foundations*. – 3.2. *Classification of BDPP Models*. – 4. Global Practice of Big Data-Driven Predictive Policing. – 4.1. *Implementation of Big Data-Driven Predictive Policing in Practice*. – 4.2. *Problems and Limitations*. – 5. Recommendations for ASEAN countries. – 5.1. *ASEAN's Institutional and Regulatory Landscape*. – 5.2. *Policy Framework for ASEAN BDPP Adoption*. – 6. Conclusions.

Keywords: *big data, predictive policing, algorithmic, data analytics.*

DETAILS FOR PUBLICATION

Date of submission: 5 Jan 2026

Date of acceptance: 7 Feb 2026

Online First Publication: 10 March 2026

Last Publication: 20 May 2026

Was the manuscript fast-tracked? - No

Number of reviewer reports submitted in the first round: 2 reports

Number of revision rounds: 2 rounds with major and minor revisions

Technical tools were used in the editorial process:

Plagiarism checks - Turnitin from iThenticate

<https://www.turnitin.com/products/ithenticate/>

Scholastica for Peer Review

<https://scholasticahq.com/law-reviews>

AI DISCLOSURE STATEMENT

This article was prepared with the assistance of AI tools. Specifically, Grammarly was employed for proofreading during the drafting process (version reviewed: December 2025). The authors confirm that all content, arguments, and conclusions were generated independently and remain their sole responsibility. No AI tool was used for generating original research findings or analysis.

АНОТАЦІЯ УКРАЇНСЬКОЮ МОВОЮ

Дослідницька стаття

ПРОГНОЗНА ПОЛІЦЕЙСЬКА ДІЯЛЬНІСТЬ НА ОСНОВІ ВЕЛИКИХ ДАНИХ: ГЛОБАЛЬНА ПРАКТИКА ТА УРОКИ ДЛЯ КРАЇН АСЕАН

Т. Хьонг Ву, Т. Фуонг До та В. К. Хоа Нгуєн*

АНОТАЦІЯ

Вступ. Використання великих даних та алгоритмічних інструментів стає все більш поширеним у правоохоронних органах. Одним із помітних нововведень є прогнозна поліцейська діяльність на основі великих даних (BDPP), яка прагне передбачити, де може статися злочин або хто може бути причетний, за допомогою аналізу великих наборів даних. Хоча прогнозування вже давно є частиною поліцейської діяльності, BDPP відрізняється масштабом та автоматизацією, спираючись на передову аналітику та машинне навчання. Хоча багато поліцейських органів розглядають BDPP як спосіб підвищення ефективності та переходу до превентивної поліцейської діяльності, його використання спричинило важливі правові та соціальні проблеми. Такі питання, як прозорість, упередженість даних, підзвітність та захист основних прав, залишаються не вирішеними, особливо в країнах АСЕАН, де правові межі для алгоритмічної поліцейської діяльності все ще розробляються.

Методи. Ця стаття базується на якісному огляді літератури академічних та кримінологічних досліджень, політичних документів щодо прогносної поліцейської діяльності. У ній розглядається, як BDPP працює на практиці, з наголосом як на місцевих, так і на особистих моделях. У статті розглянуто вибраний досвід Сполучених Штатів, Нідерландів та Великої Британії для оцінки ефективності прогносної поліцейської діяльності, а також її практичних обмежень та пов'язаних з цим проблем. З огляду на ці висновки, у статті визначено уроки, які можуть бути актуальними для країн АСЕАН, що розглядають можливість впровадження подібних підходів.

Результати та висновки. У статті показано, що хоча BDPP пропонує потенціал для підвищення ефективності правоохоронних органів та проактивного розподілу ресурсів, глобальні дані зі США та Європи вказують на неоднозначну ефективність та суттєві ризики щодо алгоритмічної упередженості, прозорості та основних прав. Для країн АСЕАН, де інституційний потенціал та режими захисту даних суттєво відрізняються, доцільним є обережне та поетапне впровадження. Пріоритет слід надавати контрольованим пілотним проектам, які базуються на місцях, що підтримуються чіткими правовими мандатами, стандартами управління даними, незалежним оглядом та постійним людським наглядом.

Ключові слова. Великі дані, прогнозне поліцейське управління, алгоритмічний аналіз, аналітика даних.

TÓM TẮT BẰNG TIẾNG VIỆT*

Bài báo nghiên cứu

DỰ BÁO CẢNH SÁT VỚI DỮ LIỆU LỚN: THỰC TIỄN THẾ GIỚI VÀ BÀI HỌC CHO CÁC QUỐC GIA ASEAN

Vũ Thu Hương*, Đỗ Thị Phượng, Nguyễn Việt Khánh Hoà

TÓM TẮT

Bối cảnh: Trong những năm gần đây, dữ liệu lớn và các công cụ phân tích thuật toán ngày càng được ứng dụng rộng rãi trong hoạt động điều tra, truy tố và xét xử. Trong đó, dự báo cảnh sát bằng dữ liệu lớn được coi là một trong những hướng đi triển vọng nhất, giúp dự đoán những khu vực có nguy cơ cao hoặc những người có khả năng liên quan đến tội phạm thông qua hoạt động xử lý và phân tích các tập dữ liệu quy mô lớn. Mặc dù dự báo tội phạm từ lâu đã là một phần quan trọng của hoạt động cảnh sát nhưng dự báo cảnh sát sử dụng các phương pháp phân tích nâng cao và học máy để nâng cao quy mô và mức độ tự động hóa. Nhiều lực lượng cảnh sát trên thế giới nhìn nhận đây là bước chuyển mình tích cực, hướng tới một mô hình dự báo mang tính chủ động, phòng ngừa hơn. Tuy nhiên, cũng có không ít những lo ngại về tính minh bạch của thuật toán, nguy cơ sai lệch dữ liệu, trách nhiệm giải trình và việc bảo đảm các quyền và tự do của dân chúng. Những vấn đề này cũng đặc biệt nan giải ở khu vực ASEAN, nơi hành lang pháp lý điều chỉnh hoạt động dự báo cảnh sát nói riêng và thuật toán, trí tuệ nhân tạo nói chung vẫn đang trong giai đoạn hình thành và chưa thực sự hoàn thiện.

Phương pháp: Bài viết được thực hiện theo phương pháp tổng quan tài liệu định tính, trên cơ sở nghiên cứu và đối chiếu các công trình học thuật, tài liệu tội phạm học và văn bản chính sách liên quan đến lĩnh vực dự báo cảnh sát. Từ đó, nghiên cứu làm rõ cơ chế vận hành trên thực tế của hai mô hình chính: mô hình dựa trên địa điểm và mô hình dựa trên cá nhân, thông qua các trường hợp điển hình tại Hoa Kỳ, Hà Lan và Vương quốc Anh. Trên cơ sở đó, bài viết phân tích, đánh giá hiệu quả, hạn chế của dự báo cảnh sát, đồng thời rút ra những bài học thực tiễn mà các quốc gia ASEAN có thể tham khảo khi cần nhắc áp dụng trong tương lai.

Kết quả và kết luận: Kết quả nghiên cứu chỉ ra rằng dự báo cảnh sát mang lại triển vọng nhất định trong việc nâng cao hiệu quả và tối ưu hóa việc phân bổ nguồn lực, tuy nhiên các bằng chứng thực nghiệm từ Hoa Kỳ và châu Âu lại cho thấy kết quả chưa đồng đều và tiềm ẩn không ít rủi ro, đặc biệt về sai lệch thuật toán, mức độ minh bạch và nguy cơ xâm phạm quyền của dân chúng. Đối với các nước ASEAN - nơi năng lực thể chế cũng như mức độ hoàn thiện của cơ chế bảo vệ dữ liệu còn có sự chênh lệch lớn giữa các quốc gia, một lộ trình tiếp cận thận trọng, có kiểm soát và triển khai theo từng bước là hết sức cần thiết. Ưu tiên trước mắt nên tập trung vào các dự án thí điểm khoanh vùng địa bàn cụ thể, được đặt trong một khung pháp lý minh bạch và rõ ràng, đi kèm với các tiêu chuẩn quản trị dữ liệu chặt chẽ, cơ chế đánh giá độc lập, và quan trọng hơn hết là sự giám sát thường xuyên, liên tục của con người trong toàn bộ quá trình vận hành.

Từ khóa: dữ liệu lớn, dự báo cảnh sát, thuật toán, phân tích dữ liệu.

* The publication metadata in Vietnamese is presented as submitted by the authors.