

A report by Steve O'Connell AM

# Artificial Intelligence: A new Era in Policing

This report explores how using Artificial Intelligence (AI) in policing is the next step in Met reform and explores how AI can be used in policing and the ethical considerations around this. By introducing AI into policing will help solve many of the new and emerging problems faced by the MPS and demonstrates how AI has the potential to revolutionise policing.



# Artificial Intelligence: A New Era of Policing.

## Executive Summary.

The Metropolitan Police Service (MPS) is facing the combined issues of fewer police officers and an increase in demand for police services. To address this challenge, the MPS has been looking for and implementing smarter ways of working, such as rolling out a modernisation programme with the introduction of digital policing.

The world has changed and so has policing. The Met is constantly facing a broad range of threats and challenges which require the Service to adapt smartly and effectively. Modern and emerging technologies have the potential to help the Met to address these challenges and make Londoners safer. This report will cover the ways policing has and will change, and the opportunities that artificial intelligence and machine learning present, including saving money and the ethical considerations associated with this.

Artificial Intelligence is an emerging concept and its potential is not yet being fully utilised. Many of the ideas in this report will take further the implementation of existing

programmes and ideas than other law enforcement agencies in both the UK and abroad. The MPS operates in a world city and is often looked to for inspiration and best practice by law enforcement agencies across the world; it therefore should be leading in innovation. Artificial Intelligence is a key area which, if done right, the MPS can lead the world, develop a crime fighting-tool, and set best practice.

There will be several benefits from Artificial Intelligence. It will allow the MPS to not only detect and solve more crime, but also allow it to build upon existing strengths whilst freeing up human resources to focus on priority areas. It can also act as a performance management tool to increase productivity in the workforce. This all needs to be underpinned by ethical standards on use and compliance with data management legislation. The following recommendations demonstrate how this can be achieved:

**Recommendation 1:** Reduce the Mayor's Office for Policing and Crime (MOPAC) budget from the current level of £58.1m to the 2016/17 level of £47.6m to save £10.5m to fund Artificial Intelligence for the MPS.

**Recommendation 2:** Develop Artificial Intelligence, Machine Learning and Advanced Analytics Software that can access all Metropolitan Police Data to help solve crime and identify patterns, and use the resulting £30m savings to fund an extra 545 police officers.



**Recommendation 3:** Ensure all police officers and relevant staff have access to real time Artificial Intelligence output.

**Recommendation 4:** Implement transparent performance monitoring system within the MPS and integrate it with AI as a tool to establish common factors behind good and inferior performance and make improvements.

**Recommendation 5:** Use Artificial Intelligence in line with data protection laws to search significant volumes of digital evidence to ensure that the correct decision is made when determining whether to continue with a case and that the correct disclosures are made to the CPS and courts.

**Recommendation 6:** Purchase a proven Artificial Intelligence platform and roll it out across as pilot scheme (potentially Westminster) in line with the other recommendations, and through the reduced budget for the Mayor's Office for Policing and Crime (MOPAC) central office costs.

**Recommendation 7:** Create an oversight panel, consisting of members of the Metropolitan Police Ethics Panel, police officers and technology experts, to specifically monitor the use of Artificial Intelligence and its outcomes, mainly by:

- Creating the code of ethics;

- Monitoring the decision-making tree and outcomes to look for biases;
- Ensuring any AI system is compliant with legislation and to consider other ethical issues around privacy.

**Recommendation 8:** Introduce a Technology Code of Ethics to establish a basic set of principles on how Artificial Intelligence is used, formulated by the oversight panel.

## Introduction.

Besides crime, there are three big challenges facing the Met and policing in general: resources, demand and technology. Each area presents its own challenges but interlink with the others and the Met's ability to tackle crime.

The MPS is already undertaking a modernisation programme with the implementation of digital policing such as iPads. This report will look at how embracing Artificial Intelligence is the next logical step and will build upon the work already done. Where the MPS is already undertaking work, such as Facial Recognition, this report will look for the lessons to be learned.

This report will show that Artificial Intelligence can not only help solve the problems faced by the MPS, but it also has the potential to improve outcomes. It will give Londoners a better police service that is equipped to deal with modern and old threats alike.

## The Need for Change: Resources, Demand

### Resources.

The issue of police resourcing dates back to 2010, when the country was in the midst of a recession and the budget deficit was running at £148.8 billion.<sup>1</sup>

To fix this, the Government tightened spending, including the police budget. The table shows that reducing the deficit (\*£billions. <sup>2</sup>)

Financial Years	2009/10	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18
Deficit	154.8	142.1	123.8	124.1	100.0	90.9	75.8	47.4
as % GDP	10.1	8.9	7.5	7.3	5.6	4.9	4.0	2.4

The table shows that the budget deficit was £154.8bn in 2009/10 and by 2016/17 it was £47.4bn. Now, after eight years, a budget surplus has been reported this year.<sup>3</sup>

With the implementation of fiscal constraint, police forces have played their part and made savings, including the Met.

In 2011/12, the MPS Budget was £3,294.2m<sup>4</sup> and by 2016/17 it had

<sup>1</sup> <https://www.ons.gov.uk/economy/governmentpublicsectorandtaxes/publicspending/bulletins/ukgovernmentdebtanddeficitforeurostatmaast/december2017/pdf> page 5

<sup>2</sup> <https://www.ons.gov.uk/economy/governmentpublicsectorandtaxes/publicspending/bulletins/ukgovernmentdebtanddeficitforeurostatmaast/december2017/pdf>

<sup>3</sup> <https://www.independent.co.uk/news/business/news/uk-public-finances-surplus-budget-ons-philip-hammond-austerity-a8319321.html>

<sup>4</sup> <https://www.london.gov.uk/file/9638/download?token=5Ga5zyUm> page 21

<sup>5</sup> <https://www.london.gov.uk/sites/default/files/2016-17finalmayorsbudget.pdf> page 25

fallen to £2,883.5m<sup>5</sup>. It is only after this that the budget started to increase again, with a budget of £3,038.8m in 2018/19.<sup>6</sup> Once inflationary pressure is considered, the previous Mayor Boris Johnson made savings of around £600m.<sup>7</sup> This was done while maintaining the financial commitment to pay for 32,000 police officers.<sup>8</sup>

Since Sadiq Khan became Mayor in 2016, the Home Office contribution to the MPS has been frozen at £1,882.1m; and the government grant for extra work undertaken by the Met has also been frozen at £423.3m<sup>9</sup>. There has been an increase in business rate income for the MPS and the Mayor has raised a further £49m from an increase in council tax<sup>10</sup> and plans to do the same again next year.<sup>11</sup>

Much of the savings under the previous Mayor were generated through reducing back-office functions, and reducing and consolidating the size the Metropolitan Police estate. The current Mayor has opted to reduce the number of police officers at a time when demand on the police is going up (this will be covered further on in this report). With things remaining

<sup>6</sup> <https://www.london.gov.uk/sites/default/files/finalconsolidatedbudget2018-19.pdf> page 28

<sup>7</sup> <https://www.independent.co.uk/news/uk/politics/boris-johnson-uxbridge-police-station-closure-constituency-shut-london-mayor-policy-met-police-a8035396.html>

<sup>8</sup> <http://www.mayorwatch.co.uk/sadiq-khan-accused-of-dropping-32000-met-cops-pledge/>

<sup>9</sup> <https://www.london.gov.uk/sites/default/files/finalconsolidatedbudget2018-19.pdf>

<sup>10</sup> <http://www.itv.com/news/london/2018-02-22/sadiq-khan-wants-to-increase-council-tax-to-help-tackle-knife-crime-and-boosting-police-numbers/>

<sup>11</sup> <https://www.bbc.com/news/uk-england-london-44657256>

equal, this will lead to a reduction the amount of work the police can undertake.

Artificial Intelligence is a potential solution to this problem, as a computer can undertake the work of hundreds or even thousands of people to aid the police in their crime fighting endeavours. This could improve outcomes whilst using fewer resources. This report will explore how this can be achieved.

## Demand.

The best measure of crime, the Crime Survey of England and Wales (CSEW), shows that crime is falling but the level reported to the police is increasing.<sup>12</sup> While often cited as the best indicator of crime trends, as it includes non-reported incidents, the CSEW is somewhat inconsequential to the police if reports are on the increase. The police can only investigate crime they know about and, if reporting is increasing, then the demand on the police is increasing.

The CSEW indicates that crime fell by 9% in the 12 months to June 2017 compared with the year before. At the same time, police-recorded crime went up by 13%.<sup>13</sup>

This shows that the demand for police services is on the increase while the Mayor is cutting police officer numbers. That means

fewer police officers, dealing with more crime.

The increase in demand is not a singular issue. It is not only a result of increases in reporting that are putting strains on the service, but also the complexity of what the police deal with is also increasing.

One such aspect of the more complex demand faced by the police is vulnerability. Regardless of whether a crime has been committed, the police have a duty of care. They are often the first responders to people in distress or have to provide extra help to the victims and even the perpetrators of crime.

The College of Policing defines vulnerability as:

*“A person is vulnerable if, as a result of their situation or circumstances, they are unable to take care of or protect themselves or others from harm or exploitation.”<sup>14</sup>*

This is a very broad statement, but it reflects the issues faced by our modern police force. As the first responders to many instances, it is the police who come into contact with the most vulnerable at their most vulnerable.

Perhaps the best example of this is mental health. If someone is having a public mental health incident, it is likely that the police will be called and therefore have first ownership of the situation.

<sup>12</sup> <https://www.bbc.co.uk/news/uk-41149778>

<sup>13</sup> <https://www.bbc.co.uk/news/uk-41149778>

<sup>14</sup> [http://www.college.police.uk/News/College-news/Pages/police\\_transformation\\_fund.aspx](http://www.college.police.uk/News/College-news/Pages/police_transformation_fund.aspx)

Last year mental health provisions meant it was no longer possible to place under 18s experiencing a mental health crisis in a police cell. Going forward for adults, the use of police cells as places of safety will be significantly restricted and it will only be possible for them to be used in exceptional circumstances.<sup>15</sup>

Now, the police are expected to ensure that people experiencing a mental health crisis are taken to a designated place of safety where they can be cared for in an appropriate manner. This creates more work; an appropriate safe space will need to be found and the person's needs will need to be dealt with before the location is found and while in transit.

Dealing with vulnerability has become one of the Police Service's main roles and challenges. Quantifying the demand from vulnerability has proven difficult; however, the College of Policing has done some work on this. They asked 12 forces to provide data on vulnerable adult, vulnerable children and domestic abuse referrals to Public Protection Units and found the following:<sup>16</sup>

10 forces provided some data over varying time frames. All forces had seen an increase in vulnerable child referrals over the last 3 to 5 years, although the scale of the increase varied, ranging from 1 per cent to 91 per cent. Across the 10 forces, there

was an average of around 10,000 vulnerable child referrals a year. Vulnerable adult referral data received indicated that all but 2 of the 10 forces that provided data had seen an increase in referrals. The scale of some of the increases seen were very large (over 1000%) and may reflect changes in recording / reporting systems as well as changes in demand.

Domestic abuse referral data received indicated that 9 out of the 10 forces that provided data saw an increase in referrals over the last 3 to 5 years which equated to an average increase of 7%. Across the 9 forces there was an average of just under 25,000 referrals received in 2013/14.

With this being such a big part of being a modern police officer, it is key to understand how this affects other aspects of policing. The result is prioritisation, with crimes involving 'vulnerable individuals' taking precedence over the non-vulnerable.<sup>17</sup>

The report will later explore how AI and big data can help the Police Service solve day-to-day crime. This will allow the police to continue to solve crimes that have become a lower priority and involve non-vulnerable members of society, as well as providing a better service for the most vulnerable.

<sup>15</sup> <https://www.gov.uk/government/news/new-rules-restricting-the-use-of-police-cells-as-places-of-safety-come-into-effect>

<sup>16</sup> [http://www.college.police.uk/News/College-news/Documents/Demand%20Report%2023\\_1\\_15\\_noBleed.pdf](http://www.college.police.uk/News/College-news/Documents/Demand%20Report%2023_1_15_noBleed.pdf)

<sup>17</sup> <https://www.thetimes.co.uk/article/police-to-prioritise-vulnerable-victims-x2v89pp9g>

## A new way of working - Artificial Intelligence.

This report has so far shown how the combined effects of reduced resources, increased demand for services and the pressures from dealing with vulnerability mean the police must do more for less.

Artificial Intelligence has the ability to perform menial tasks that would ordinarily need a human being to undertake, such as searching and analysing data. This has the potential to free up police officers to focus on other areas of their work, as well as acting as a tool to improve the service provided.

## Defining Artificial Intelligence.

As discussed in the introduction, under Sadiq Khan's Mayoralty, police numbers have been cut while demand has increased. There is a need to use the resources available better, but there is also the question of how to fill the gap left by the reduction. To understand how AI can be used with this, we need to understand what it is. The House of Commons Science and Technology Select Committee defines AI as:<sup>18</sup>

“A set of statistical tools and algorithms that combine to form,

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<sup>18</sup> <https://publications.parliament.uk/pa/cm201719/cmselect/cmsctech/351/351.pdf> page 7

in part, intelligent software that specializes in a single area or task. This type of software is an evolving assemblage of technologies that enable computers to simulate elements of human behaviour such as learning, reasoning and classification”

In essence, programming computers to carry out tasks that could normally be done or controlled by a human.

## Artificial Intelligence and police data.

Before we can understand what AI can do for the police using big data, we need to know what data the police hold and how they can use it in compliance with data protection rules. The MPS has control of and access to enormous amounts of data, which can be called upon as needed.

The MPS has access to a number of databases that contain information on a cross-section of areas that would be impossible to link together in a meaningful way by conventional means.

The Police National Computer (PNC) is a national database that provides real-time checks on people, vehicles, crimes and property<sup>19</sup>. PNC allows for a number of checks against these fields, including but not limited to: checking criminal records,

<sup>19</sup> <http://www.college.police.uk/What-we-do/Learning/Professional-Training/Information-communication-technology/Pages/PNC-Police-National-Computer.aspx>

known associates, missing people, outstanding warrants, driving history, personal details, lost or stolen property and Schengen Information from European partners<sup>20</sup>.

The Police National Database (PND) is available to all police forces and wider criminal justice agencies throughout the United Kingdom, allowing the Police Service to share local information and intelligence on a national basis

The MPS are in the process of creating an integrated policing system to link all their databases,<sup>21</sup> for which the contract was signed this year<sup>22</sup>. The combined databases include: the Crime Record Information Systems (CRIS) on which details of crimes and domestic incidents are logged; the Criminal Intelligence system (CrimInt); Merlin, a database run by the Metropolitan Police that stores information on children who have become known to the police for any reason; Airspace, which supports the case management of anti-social behaviour; NSPIS, which is used to log a detainee's time in police custody; the Case Overview and Prosecutions Application (COPA); and the Emerald Warrant Management System (EWMS)<sup>23</sup>. This is a good step forward as it will allow police

officers and staff to see a detailed picture of a person.

Automatic Number Plate Recognition (ANPR) is used to help detect, deter and disrupt criminality at a local, regional and national level, including tackling travelling criminals, Organised Crime Groups and terrorists<sup>24</sup>. It works by capturing an image of a registration number as a vehicle passes an ANPR camera within the system and then to read that number using optical character recognition (OCR) technology. The record of that vehicle registration number is then logged having been at that location of the camera at the given time.<sup>25</sup>

The police have the data that is needed to underpin AI. This gives them an advantage as many organisations who wish to use AI would need to implement a system to gather and record data.

AI can cross-reference different sets of data from these systems and look for patterns to aid the police in many aspects of their work, including solving crime. The below graphic and an example of how this could work:

Over a hypothetical period of time, several burglaries are entered on the CRIS database.

<sup>20</sup> <http://www.college.police.uk/What-we-do/Learning/Professional-Training/Information-communication-technology/Pages/PNC-Police-National-Computer.aspx>

<sup>21</sup> <https://www.governmentcomputing.com/police-bluelight/news/newsthe-met-explains-thinking-behind-new-integrated-policing-system-4862503>

<sup>22</sup> <https://www.computerweekly.com/news/252440715/Met-Police-to-get-integrated-policing-system-from-Northgate>

<sup>23</sup> <https://www.governmentcomputing.com/police-bluelight/news/newsthe-met-explains-thinking-behind-new-integrated-policing-system-4862503>

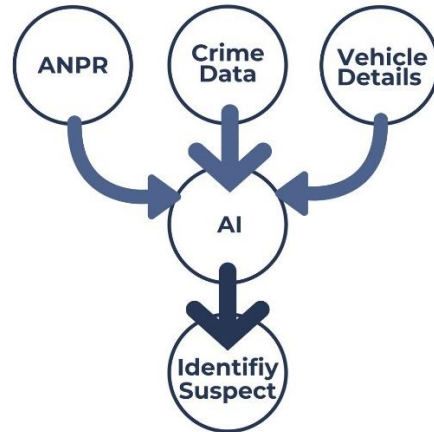
<sup>24</sup> <http://www.npcc.police.uk/FreedomofInformation/ANPR.aspx>

<sup>25</sup> <http://www.npcc.police.uk/documents/The%20Use%20of%20ANPR%20by%20Law%20Enforcement%20Agencies.pdf> page 2

### Case Study: DAS

In New York, terrorism and crime prevention are the clear strategic priority of the NYPD's DAS system. It was initially developed by the Counterterrorism Bureau, and now is used extensively in daily policing. It collects and analyses data from sensors—including 9,000 closed circuit TV cameras, 500 license plate readers with over 2 billion plate reads, 600 fixed and mobile radiation and chemical sensors, and a network of ShotSpotter audio gunshot detectors covering 24 square miles—as well as 54 million 911 calls from citizens. The system also can draw from NYPD crime records, including 100 million summonses.

it can find patterns that are beyond the ability of any one person. A good example of this working is DAS in New York:



Source<sup>26</sup>

The AI system spots a pattern: every time one of these burglaries takes place, the same vehicle is registered by ANPR in the vicinity. The system then finds that the vehicle is listed on PNC as being owned by an individual with a criminal history of burglary. Now a suspect has been identified, traditional policing methods can be used, such as obtaining a warrant to search their known place of residence and questioning them.

DAS is a system that has evolved over time, from a single focus on counter terrorism to a system taking all the information available to the police and using it to fight crime. Speaking publicly, Police Commissioner William J. Bratton, said “DAS is essential in keeping New York City safe from crime and terrorism. The New York Police Department (NYPD) uses DAS every day to save lives, arrest criminals, and better serve the public.”<sup>27</sup>

For a person to perform the same task will take a considerable amount of time. They would have to manually check all burglaries against thousands of ANPR records and then check if there are any criminal records of the owners of vehicles of interest. This is not practical except for major crimes. AI can do what a human can do at much faster speeds, but goes beyond this, as

DAS is designed for the New York Police Department, and, as such, utilises the resources available to them, but there are similarities, such as access to Automatic Number Plate Recognition and criminal records data. The DAS has had a variety of benefits for the NYPD, including saving at

<sup>26</sup> <http://fortune.com/2016/07/17/big-data-nypd-situational-awareness/>

<sup>27</sup> <https://www.informs.org/Impact/O.R.-Analytics-Success-Stories/NYPD-Domain-Awareness-System-DAS>

least \$50m (£37.5m) per year.<sup>28</sup> This NYPD police budget is bigger than the Met Police, at \$5.3m (£3.9bn),<sup>29</sup> this would equate to savings of £30m for the MPS, enough for 545 police officers.

The benefits of the MPS adopting this AI model of policing will be fourfold:

- Increase the number of crimes solved by aiding in the solving of crimes;
- Increased the arrest rate and the faster solving of crimes will prevent further crime taking place;
- Free up resources for front line policing;
- Save police officer time conducting investigations and allow them to spend their time solving other crimes.

In short, AI will increase and improve outcomes, and allow for a better use of police resources. It is, however, imperative that the ethical considerations raised further on in this report are taken into account here, especially with regard to privacy and data handling legislation.

## Access to Artificial Intelligence.

As with any tool for any organisation, its effectiveness depends on its user end experience and ease of access. This concept equally applies to AI.

<sup>28</sup> <https://www.informs.org/Impact/O.R.-Analytics-Success-Stories/NYPD-Domain-Awareness-System-DAS>

<sup>29</sup> <http://council.nyc.gov/budget/wp-content/uploads/sites/54/2017/03/056-NYPD.pdf>

Regarding usability, this means making sure that the information generated by AI is easy to understand.

The Interactive Design Foundation states that “our job as humans is to understand the information, invent sequences of commands through which it can be transformed or processed, and—finally—make sense of the end results of computation by matching these with their intended goals or the surrounding environment”<sup>30</sup>

Using AI to obtain information for those who need it can be difficult; with such large amounts of data being analysed, the information needs to be presented in a way that they understand.

For AI to be fully utilised by the MPS, it is imperative that those on the front line have access to outcomes generated by the system to aid them in their duties. Providing an app on mobile devices is a solution here. There also needs to be a central overview that looks at the AI data from a strategic point of view, where emerging patterns and trends can be identified to ascertain if there is a pattern

## Artificial Intelligence as a Performance Tool.

Performance management, also known as performance

<sup>30</sup> <https://www.interaction-design.org/literature/article/no-ui-how-to-build-transparent-interaction>

monitoring, describes the tools and processes in place to analyse data from a network or application's performance with the intention of discovering and troubleshooting problems.<sup>31</sup>

The MPS is one of the largest employers in London; as of April 2018, it employed 41,912 personnel.<sup>32</sup> In such a big organisation, there will be teams within team within teams, making it difficult to assess individual and front-line performance from the top, especially with the current one-to-one Personal Development Review (PDR) process currently employed by the MPS. There is also the issue of individual employees and teams comparing their performance to others.

AI can not only monitor performance, but it can also look for patterns on what the driving factor behind that performance is. Before this can be achieved, the MPS needs to change how it monitors performance, away from the traditional PDR to real-time analysis.

To do this, all performance data should be accessible to all parts of the organisation and searchable against set criteria. For example, a police officer should be able to compare their own Sanction Detection Rate against the average and view, with personal details removed, what the scores are of the top performers. This should also be

searchable by field, for example, burglary.

Moving up the command chain, managers will be able to compare individual members of their teams to see who is the best and worst performing. This will allow managers to take action; they may wish to ask their top performers to mentor their worst performers. Alternatively, they could decide to instigate extra training for the worst performers. Manager can also compare their team to comparable teams elsewhere in the organisation, allowing the weaker-performing teams to seek advice and guidance from the best-performing teams, commonly known as sharing best practice.

Once a comprehensive performance management process is in place, AI can be used to spot patterns and determine what works and what does not.

When an individual member of staff or team performs well, AI can look for patterns to see if there is a common factor behind it. For example, it may be identified that the best performers attended a particular training course. The training course can then be recommended for other relevant staff and any course that has had little or no impact can be scrapped.

There is no way to predict what AI may find, which is why we should

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<sup>31</sup> <https://www.sdxcentral.com/performance-management/definitions/ai-performance-management/>

<sup>32</sup> <https://www.london.gov.uk/what-we-do/mayors-office-policing-and-crime-mopac/data-and-statistics/policing/workforce-dashboard>

explore it: it goes beyond what we as human beings can do.

## Artificial Intelligence for digital evidence.

It has recently been reported that a series of high profile rape trials have collapsed due to police failures in disclosing evidence<sup>33</sup>. A key reason behind this, but not limited to, was the sheer volume of data that the evidence contained. Key messages that cast doubt on the claimant's allegations were hidden in thousands of private messages. Unless there is a reason to suspect evidence is hidden within these messages, the police will not spend considerable amounts of times searching through them. Senior figures within policing and justice are proposing AI as a solution to this.

Senior police officer Chief Constable Sara Thornton, Chair of the National Police Chiefs' Council, said:

"I think the challenge for us is how we can use technology more, beyond search terms. So how can you use ... machine learning, artificial intelligence, whatever phrase you want to use, to get clever tech to help us to do this?"<sup>34</sup>

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<sup>33</sup> <http://www.itv.com/news/2018-06-05/police-and-cps-to-be-quizzed-over-disclosure-failures-in-rape-cases/>

<sup>34</sup> <https://www.theguardian.com/uk-news/2018/feb/08/police-may-need-ai-to-help-cope-with-huge-volumes-of-evidence>

<sup>35</sup> [https://www.theregister.co.uk/2018/06/19/ai\\_solve\\_disclosure\\_scandal\\_gross\\_lj/](https://www.theregister.co.uk/2018/06/19/ai_solve_disclosure_scandal_gross_lj/)

Speaking about the need for AI, Appeal Court Judge, Lord Justice Gross, said:

"In one case investigated by London's Metropolitan Police, it took 630 hours for the police disclosure team to review the content of the three complainants' mobile phones and their Facebook accounts".<sup>35</sup>

Even when there is a reason to look through messaging data, police officers spending 630 hours on this is not a good use of time. Given that a full-time police officer works 40 hours per week<sup>36</sup>, this equates to a single police officer spending 15.75 weeks looking through messaging data. That is 0.3 of a full-time position.

AI can help with this problem. A programme can be taught the difference between relevant and non-relevant data, apply the reasoning learnt from this to new tasks and make a classification based upon this. Precisely what a human would do over the course of a lifetime or career.

It has been argued that looking through the personal messages of complainants is intrusive and will put victims off coming forward.<sup>37</sup> AI could help alleviate some of these concerns. Under the current model, it is likely that several police officers and even legal professionals may end up with

<sup>36</sup> <https://www.prospects.ac.uk/job-profiles/police-officer>

<sup>37</sup> <https://www.theguardian.com/commentisfree/2018/mar/21/rape-complainant-loss-privacy-intrusive-investigations>

access to data to review. Using AI will eliminate the need for a person to read all these messages, instead, only viewing anything flagged by the system. In this case, AI can be used to increase and protect an individual's privacy.

This is by no means limited to rape investigations. Many criminals may incriminate themselves in private messages, but it is simply impractical to read through them. For example, a burglar may try to sell stolen goods via a text message, or someone guilty of assault may text a friend saying what they did. AI is a practical solution to issues with big data evidence and should be implemented as a priority.

## How to deliver and fund Artificial Intelligence.

The benefit of AI is that it is not resource-intensive; it is designed to do large and complex tasks without the need for human input until the conclusions are drawn. Avon and Somerset Police have used an off-the-shelf platform called Qlik Q<sup>38</sup> which has multiple analytical AI functions<sup>39</sup>

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<sup>38</sup> <https://www.qlik.com/en-gb/company/press-room/press-releases/0111-police-force-visualizes-incident-operations-data-fight-crime-faster-improve-public-safety>

<sup>39</sup> <https://www.qlik.com/us/company/press-room/press-releases/0424-qlik-showcases-innovation-for-the-data-driven-enterprise>

<sup>40</sup> <https://www.qlik.com/en-gb/pricing>

<sup>41</sup> <https://www.london.gov.uk/what-we-do/mayors-office-policing-and-crime-mopac/data-and-statistics/policing/workforce-dashboard>

If we use the Avon and Somerset Police model as base on which the MPS can explore its options, it should be able to implement this for just over £7.5m per annum. This has been calculated by assuming a £15 a month license fee for each employee<sup>40</sup>, based on a current staff level of 41,912 (April 2018)<sup>41</sup>. However, a full roll-out may present difficulties and should be piloted first. If the pilot took place in the Central West BCU, it would cost £324,540 for one year. This is based on 1,803 police officers.<sup>42</sup>

There is scope for saving in the MPS budget. The Mayor's Office for Policing and Crime (MOPAC) had a budget of £47.6m in 2016/17.<sup>43</sup> In 2018/19 this has risen to £58.1m.<sup>44</sup> Returning to 2016/17 levels would save £10.5m. Some of this funding could be spent rolling out AI within the MPS.

## Ethics.

This report has shown the many opportunities presented by Artificial Intelligence, but there are risks involved and raises the question of ethics. It is essential that the public have confidence in the police to handle their data, ensuring that there will not

<sup>42</sup> [http://questions.london.gov.uk/QuestionSearch/searchclient/questions/question\\_298739](http://questions.london.gov.uk/QuestionSearch/searchclient/questions/question_298739)

<sup>43</sup> <https://www.london.gov.uk/sites/default/files/2016-17finalmayorsbudget.pdf> page 26

<sup>44</sup> <https://www.london.gov.uk/sites/default/files/finalconsolidatedbudget2018-19.pdf>

unnecessary invasions of privacy and data is not misused.

Ethics can broadly be broken down in three areas: transparency, bias and privacy.

## Transparency.

One of the key issues with AI is the ability for a human to see and understand how a decision or conclusion has been reached. AI has the capability to analyse vast amount of data beyond the ability of a human being and see patterns that may otherwise be obscured; this is known as machine learning<sup>45</sup>. It will then apply this newly acquired pattern to its decision-making process and influence its conclusion. This could involve thousands of interlinked datasets, thus the means by which the conclusion was reached is highly complex.

David Stern, quantitative research manager at G-Research, said, "In the currently popular neural network approach, this training procedure determines the settings of millions of internal parameters which interact in complex ways and are very difficult to reverse engineer and explain."<sup>46</sup>

By its very nature, AI is adaptive and evolves over time. This presents legislators with problems; how do they create laws that could become obsolete

within a relatively brief period time without over-regulating the sector to such an extent that its benefits cannot be fully utilised? The House of Lords Artificial Intelligence Committee's latest report states "the development of intelligible AI systems is a fundamental necessity if AI is to become an integral and trusted tool in our society".<sup>47</sup>

MIT has created a way for neural networks to be trained so they can provide rationale for their decisions. This opens AI to scrutiny on the decisions it makes.<sup>48</sup>

It is important that the process behind AI decision-making is transparent in order to uphold the fairness of the justice system. The implications of these decisions can lead to people being arrested and charged with a crime, with their liberty in jeopardy. The outcomes generated by AI need to hold up to scrutiny, perhaps in a trial in a way that a jury can understand.

Trust in AI is absolutely vital to its success. This trust in the system is critical to upholding the rule of law and ensuring fair justice.

To scrutinise AI, there needs to be set of principles on which AI can be used that can be adapted and changed over time as new issues emerge and the risks from previous issues have be mitigated. This could be in the form of a Code of Ethics that is

<sup>45</sup>

[https://rusi.org/sites/default/files/20180329\\_rusi\\_newsbrief\\_vol.38\\_no.2\\_babuta\\_web.pdf](https://rusi.org/sites/default/files/20180329_rusi_newsbrief_vol.38_no.2_babuta_web.pdf)

<sup>46</sup> <https://www.bbc.co.uk/news/business-44466213>

<sup>47</sup>

<https://publications.parliament.uk/pa/ld201719/ldsselect/ldai/100/100.pdf> page 40

<sup>48</sup> <http://www.wired.co.uk/article/creating-transparent-ai-algorithms-machine-learning>

created and monitored by panel of academics, police officers and tech experts. This would provide the right level of expertise on the theory behind ethics, policing and technology.

### Case Study

The Harm Assessment Risk Tool (HART) was trained to recognise patterns of recidivism by studying the offending behaviour of criminals gathered over a five-year period.

Durham Constabulary in the UK taught the algorithm using records taken between 2008 and 2012.

The software can determine whether a suspect is at a low, medium or high risk of offending once they are released from custody.

They found that AI was 98 per cent accurate in its predictions for low risk offenders and 88 per cent accurate when it came to high risk suspects.

## **Bias.**

All data relating to people that is analysed by AI will have had, at some point, human involvement, and any bias, whether conscious or unconscious, may feed into any conclusion reached. The House of Lords Artificial Intelligence Committee states, "While the term 'bias' might at first glance appear straightforward, there are in fact a variety of subtle ways in which bias can creep into a

system. Much of the data we deem to be useful is about human beings, and is collected by human beings, with all of the subjectivity that entails."<sup>49</sup>

There is also the possibility of AI being biased through its own fruition. A good example of this has taken place in Durham Constabulary. They use an AI system called HART to help make custody decisions, which started using people's postcode to help determine if they are a risk or not. Durham Constabulary had to remove this field from the AI's decision-making process as it inadvertently discriminated against people in certain postcodes.

Source <sup>50</sup>

It is important we recognise that AI is not infallible and that biases do exist; this is especially important when people are involved. If AI is being used to determine how much risk is posed by an individual, it may use a factor such as gender or race to reach a conclusion that would have been different had these factors not been taken into account, and thus come to the incorrect conclusion. The Initiative for Building Community Trust and Justice states, "implicit bias can distort one's perception and subsequent treatment either in favour of or against a given

<sup>49</sup> <https://publications.parliament.uk/pa/ld201719/lds-elect/ldai/100/100.pdf> page 42

<sup>50</sup> <http://www.dailymail.co.uk/sciencetech/article-4491330/Police-Durham-use-Minority-Report-style-AI.html>

person or group.”<sup>51</sup> Based on this statement, it is easy to see how a particular group may benefit or lose out from the conclusions drawn.

Artificial Intelligence and Machine Learning is only as good as the data it receives.

The MPS are already trailing Facial Recognition as a crime fighting tool, so far has had difficulties with its accuracy. The issue of the what data is being used to teach the AI could be one of the reasons behind the low levels of accuracy.

To mitigate against this, there needs to be some form of oversight in order to monitor outcomes, question the data, and make subsequent recommendations on any discrepancies; the MPS will need access to demographical information to properly access the outcomes.

## Privacy.

Privacy is increasingly on the political agenda; the recent allegations that Cambridge Analytica may have used personal data harvested from Facebook for academic purposes to influence the 2016 US elections brought this to the forefront of the news agenda.<sup>52</sup> Regardless of whether there was any wrongdoing in this instance, it demonstrates that huge amounts of personal data

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<sup>51</sup> <https://trustandjustice.org/resources/intervention/implicit-bias>

<sup>52</sup> <http://uk.businessinsider.com/cambridge-analytica-boasts-won-trump-election-facebook-data-2018-3>

held are on people by third parties, enough to build profiles and gain an understanding of who that person is.

Like other organisations law enforcement organisations must show that their systems, technology and processes are fully GDPR compliant.<sup>53</sup> Law enforcement however, has specific European-wide legislation that governs its use of data. The Police and Criminal Justice Data Protection Directive regulates the use of personal data for law enforcement purposes, particularly “for the purposes of prevention, investigation, detection or prosecution of criminal offences, the execution of criminal penalties or the safeguarding against and the prevention of threats to public security.”<sup>54</sup>

The issue of privacy is already heavily governed; therefore, the need to develop new practices and codes is limited – compliance with legislation should be sufficient.

## Conclusion.

AI has the potential to revolutionise policing, perhaps even more so than the invention of the telephone or handheld radio.

Introducing AI into policing will help solve many of the new and

<sup>53</sup> <https://chaucer.com/uk-policing-and-the-gdpr/>

<sup>54</sup> <http://www.privacy-regulation.eu/en/recital-19-GDPR.htm>

emerging problems faced by the MPS. It gives them the ability to enter the big data age and stay ahead of criminals wishing to exploit emerging technologies. With strong oversight and the right expertise, we can see policing enter the modern age.

The MPS needs to avoid implementing in a fragmented manner, instead taking a holistic approach. As the UK's biggest and wealthiest force, the Metropolitan Police needs to take the lead on this and show what can be done. These recommendations will help achieve this:

**Recommendation 1:** Reduce the Mayor's Office for Policing and Crime (MOPAC) budget from the current level of £58.1m to the 2016/17 level of £47.6m to save £10.5m in order to fund AI for the MPS. The annual cost of a MPS-wide roll-out of AI is around £7.5m and will generate saving upwards of £30m.

**Recommendation 2:** Develop Artificial Intelligence, Machine Learning and Advanced Analytics Software that can access all Metropolitan Police Data to help solve crime and identify patterns, whilst using the resulting £30m savings to fund frontline policing with an extra 545 police officers.

This can be done because AI will increase and improve outcomes, and allow for a better use of police resources, including saving time and money. Combined with the extra police officers from recommendation 1, this will see an additional 599 police officers on the streets of London.

**Recommendation 3:** Ensure all police officers and relevant staff have access to real time Artificial Intelligence output, mainly:

Police officers on patrol can access analytics on individuals and vehicles via an app;  
Specialist teams receive flags on crime areas they cover on emerging patterns and trends to ascertain if there is a pattern that results in a suspect being identified;  
Police officers investigating individual crimes can access analysis on similar crimes to ascertain if there is a pattern that results in a suspect being identified.

**Recommendation 4:** Implement transparent performance monitoring system within the MPS and integrate it with AI as a tool to establish common factors behind good and inferior performance and make improvements.

The MPS can then use this information to expand good practice and eliminate factors contributing to poor performance.

**Recommendation 5:** Use Artificial Intelligence in line with data protection laws to search significant volumes of digital evidence to ensure that the correct decision is made when determining whether to continue with a case and that the correct disclosures are made to the CPS and courts.

With the implementation of GDPR, the MPS needs to ensure that all new initiatives involving data are compliant. This is also an ethical issue on how the MPS use people's personal information.

**Recommendation 6:** Purchase a proven AI platform and roll it out across as pilot scheme (potentially Westminster) in line with the other recommendations, and through the reduced budget for the Mayor's Office for Policing and Crime (MOPAC) central office costs.

A full roll out will cost around £7.5m per annum. If we assume Westminster as the pilot area. it would cost £324,540 for one year. This is based on 1,803 police officers.

**Recommendation 7:** Create an oversight panel, consisting of members of the Metropolitan Police Ethics Panel, police officers and technology experts, to specifically monitor the use of Artificial Intelligence and its outcomes, mainly by:

- Creating the code of ethics as mentioned;
- Monitoring the decision-making tree and outcomes to look for biases;
- Ensuring any AI system is compliant with legislation and to consider other ethical issues around privacy.

The oversight panel can help to ensure that the public have confidence in the police to handle their data and that data will not be misused.

**Recommendation 8:** Introduce a Technology Code of Ethics to establish a basic set of principles on how Artificial Intelligence is used, formulated by the oversight panel.

By establishing a Technology Code of Ethics, police officer and staff will know what parameters they can operate in and will help protect them against unintentional misuses.

Artificial Intelligence has the potential to revolutionise policing in London for the benefit of Londoners. It will help the police solve more crime, save time on investigations, reduce costs, and keep London safer.