

Procedural justice and analytics

Ushering in the critical new phase of augmented intelligence in criminal justice



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The world's attention is focused on policing techniques and outcomes as never before. While the mission of policing has gone through cycles of change for the past 40 years, what's happening today is a particularly high-visibility, high-stakes phase of the process. And this is just the most visible aspect of a transformation that is reshaping the entire criminal justice system (CJS).

How can the CJS rise to meet the expectations of well-informed, tech-savvy citizens, many of whom question the legality, ethics and efficacy of what they view as a wasteful public service?

Leaders and observers in the field view this as a moment of opportunity - and potential peril. In her lecture to the Royal United Services Institute, a UK-based think tank, Dame Cressida Dick - Britain's most senior police officer and Commissioner of the Metropolitan Police Service - argued that "policing will remain an essentially human service, supported by better information and tools."¹ For Dick, technology can serve to enable human policing while also making the enterprise more trustworthy and transparent.

A greater reliance on technology, enabled by advances in areas such as artificial intelligence (AI) and machine learning (ML), will require significant change on the part of stakeholders. But change often proves to be difficult in the CJS. As David Weisburd, Executive Director of the Center for Evidence Based Crime Policy at George Mason University, observes, the culture of policing is "highly resistant to change [and] police officers often experience difficulty in implementing new programs."²

In criminal justice reform, all roads lead back to fairness in procedural justice - the ability to act in a fair, informed manner that is visible to all parties involved at every step in the criminal justice continuum. From harm reduction and officer readiness to evidence-based policing, the aim of agencies and departments pursuing these strategies should be to deliver interactions that are transparently, demonstrably *fair* - from street-level encounters to courtrooms and legal proceedings. Procedural justice is the foundation of community trust, which is the foundation for a legitimate police model. And it ultimately improves policing, resulting in stronger, more effective outcomes. Conducting evidence-based research - as well as targeting, testing and tracking results inside an agency - legitimizes the decision-making process both in the agency and for the broader community it serves.³

In its 2019 paper *The Future of Policing*, Deloitte⁴ identifies five innovations likely to shape the future, including:

- Evidence-based policing.
- New modes of community involvement.
- Distributed sensing and virtual patrols.
- Using technology as a partner in the field.
- AI and predictive policing.

"It is a capital mistake to theorize before one has the data."

**Sherlock Holmes
(Sir Arthur Conan Doyle)**

¹ <https://rusi.org/events/open-to-all/rusi-annual-security-lecture>

² Policing Innovation, Contrasting Perspectives (Second Edition 2019) David Weisberg, Anthony Braga

³ Kimberley McClure, Katherine Maguire *Translating Behavioural Science into practice: A framework to determine science quality and applicability for police organisations* Journal of Forensic Sciences 64 no.1 (2019) 16 - 22

⁴ Smart Policing: Top Five Policing Innovations Shaping the Future | Deloitte US

Already, many aspects of these innovations are being put to work, and they all hinge on departments' ability to embrace technology and the digital transformation that sits behind it.

For example, police departments are already testing sensors for detecting cocaine in the water supply and neighborhood microphones that can identify gunshots at the moment of discharge. Such "ambient" detection is only the most basic application of these technologies. In a recent research paper, scientists suggested⁵ using edge-based architecture to gain a rich picture of both criminals and victims, combining Internet of Things (IoT) data, edge-level data, data from other departments and agencies, and analytical capabilities at the core.

Data-driven insights gleaned from such approaches are only valuable if they can be delivered at the moment they are needed. Without reliable, data-originated insights delivered at the moment of engagement, even the best-designed processes will fall short, stripping all the investments of time and other resources leading up to that moment of their full potential value. Why? Because it takes situation-relevant information to act fairly. An officer, for example, needs to understand the context of a dispute as fully as possible to establish fair terms of engagement in the moment. So does a presiding judge, a corrections officer or anyone at any step of the criminal justice journey.

Analytics capabilities are not new to law enforcement. Many police agencies invested in these technologies a generation ago. Others were late to adopt them and as a result have essentially skipped a generation of advances. Regardless of their approach to adopting analytics technologies, many law enforcement organizations did not adapt their workforce to be able to make the best use of these powerful capabilities. Some have been able to use these technologies to enable their people to drive innovation and a culture of change. But many others applied analytics in a highly focused, often siloed manner - not as part of a procedural justice framework or strategy.

Now is the time for that to change. Building on models established in some of the leading agencies and departments around the world and borrowing from advances in both the private sector and in agencies outside of criminal justice and policing, law enforcement agencies can shore up their existing technologies alongside newer capabilities (such as AI) on infrastructure and frameworks designed to deliver on the promises of procedural justice.

This is not some distant possibility for agencies and departments of any size - it is well within reach today. Regardless of the size or scope of the organization's procedural justice plans, these are the technologies, processes and human elements required to support those plans with analytics-derived insights.

Making the case for change

The adoption of evidence-based practices in fields such as human resources, pharmacology and education has been steady, but still slower than many had first hoped. In that context, it comes as little surprise that using big data to drive

⁵ Detecting and Tracking Criminals in the Real World through an IoT-Based System (nih.gov)

evidence-based policing (EBP) - and making all the requisite changes to policies, practices and culture along the way - is still only in its infancy. But momentum appears to be shifting today, especially in the US, Canada, Australia, New Zealand and the UK, as law enforcement leaders and the wider CJS community discover the practical value of applying analytics insights to their day-to-day activities. We at SAS want to help implement EBP, and we are working with the global community of EBP practitioners to help make it happen. We are actively helping the EBP community innovate, supporting a culture of curiosity.

Education will help - especially in a field marked by its traditional reliance on top-down decision making. The burden is on innovative leaders throughout the CJS to show their most senior decision-making peers how big data-driven analytics applied in an evidence-based policing environment can lend powerful clarity on the issues that harm communities the most. For example, in Australia, the University of Queensland Crime and Justice Group (headed by Lorraine Mazerolle, Professor of Criminology) works in a collaborative partnership with senior leaders in the CJS, focusing on what Mazerolle describes as legitimacy policing, partnership policing, systematic reviews and cybercrime. "At our core, we strive to shape a fair and just future that is built on the shoulders of academic-practitioner co-produced science," says Mazerolle.⁶

It's widely understood across industries that shifting to an analytics-driven *culture* is as important as having the right analytics technologies to realize the full value of analytics investments. Workplace culture is often one of the biggest obstacles to change. Analytics solutions must be adopted and put to work every day by the entire organization, not just an elite (and likely overworked) cadre of data scientists.

Law enforcement is no exception. It takes everyone from street-level officers and investigators to agency/department leaders and IT staff working together to realize the potential of today's analytics strategies in law enforcement - not to mention citizen expectations. As Professor Cynthia Lum and Dr. Christopher Koper, two experts in evidence-based criminal justice policy, have written, "adopting an evidence-based approach brings numerous benefits. Most obvious are the rewards reaped from employing strategies and tactics shown to reduce crime, increase legitimacy, reduce internal problems, address community concerns, or reduce fear."⁷

According to Lum and Koper, one of the primary challenges in policing has been "mission creep," in which the role of the police has expanded to fill the void left by a diminishing state. Relatedly, Harvard Kennedy School researcher Thomas Abt, in his book *Bleeding Out: The Devastating Consequences of Urban Violence*, points to the need to "first stop the bleeding." Abt suggests that while poverty reduction, criminal justice reform and gun control are all important, evidence shows that directly focusing on proximate causes of urban violence, rather than root causes, is the best way to get real results.

This provides a clear opportunity for applying big data and analytics capabilities. For example, in the US, violence is clustered among small groups of people and places, making it possible to predict and prevent with suitably high accuracy using advanced

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⁶ The University of Queensland Crime and Justice Group [TC19-Fall2020.pdf \(cebcp.org\)](#) p. 18 Mazerolle et al

⁷ Lum, Koper (2014) 'What is Evidence Based Policing?' [Evidence-Based Policing - The Center for Evidence-Based Crime Policy \(CEBCP\)](#)

analytics – as a critical component of evidence-based, data-driven prevention strategies. This is a shift from longstanding practices in many CJS organizations. “Too many cops, unfortunately, rely on their intuition, opinion or unreliable sources,” writes Professor Jerry Ratcliffe, a former police officer, in his book *Reducing Crime: A Handbook for Police Leaders*. Human expertise will continue to play the leading role in policing – data science alone will not supplant the expertise that professionals have honed for years. Instead, such insights should be augmented with science-driven insights to guide day-to-day practices.

Where should departments and agencies start? Prioritization solutions such as those developed by the Campbell Collaboration⁸ can help. Its “What Works in Criminal Justice” framework allows police and CJS leaders to follow peer reviewed meta-analysis of decades’ worth of research to develop a map of organizational priorities likely to lead to better outcomes:

What Works	Hot spot policing	Offenders management or "focused deterrence"	Problem oriented policing	Directed patrol for gun violence
What's Promising	Information gathering interrogation methods	Programs to increase procedural justice and enhance legitimacy		
What Doesn't Work	Second responder programs	Stress management programs	Juvenile awareness deterrence (Scared Straight)	

The data imperative

While data management in any analytics environment can be complex, it is driven by a simple rule: the higher the quality and the greater the variety of data, the better. When implementing a full-scale, integrated analytics strategy, for obvious reasons it is important to ensure that wherever data is being generated in the agency or department, it is directly and constantly feeding into the analytics solution.

Variety is equally important. Some of the most surprising, truly revelatory insights are derived from unexpected combinations of data. In law enforcement, this introduces another layer of complexity because it relies on interdepartmental or even interagency coordination between groups that do not often coordinate at all. Data from disparate sources that are not often combined today can create a dramatically richer picture of suspects and situations, both in the moment and well after the fact. These types of nontraditional connections between data sources do not just happen – they are the

⁸ Campbell Crime and Justice Group

result of planning and coordination that should begin before analytics strategies are put in place and should continue well after.

Regardless of whether an agency is combining data from multiple sources or simply attempting to shore up its own data intake, management and application volume are other critical factors in data management. Organizations across the criminal justice spectrum are generating and collecting more data than at any time in history, due in large part to advanced technologies designed with built-in data reporting capabilities. As a result, agencies need to adopt and use equally advanced solutions for managing and understanding all that data. For example, SAS® text search solutions make it possible to easily search large volumes of text data in order to find keywords or phrases that may be important to an investigation.

Finally, data management strategies should be designed for velocity – police, investigators and others involved in criminal justice need data-derived insights at the moment they can make a difference, not weeks or months after the fact. This requires systems that are capable of delivering a steady stream of current data to analytics capabilities that are equally well prepared to make sense of the data and direct the resulting insights to the appropriate users. Body cameras, for example, generate massive amounts of data. When the images and audio data created by body cameras are streamed directly to highly automated analytics solutions, such as image recognition and voice-to-text capabilities, other users and automated systems can quickly scour the resulting data for information relevant to policing and investigation.

Achieving scale through AI

Most law enforcement agencies and departments today are already using analytics capabilities – but they are using them in discrete ways, in individual aspects of the criminal justice continuum. This is a challenge of scale and speed. It's one thing to implement analytics capabilities that focus on delivering insights to inform smarter investigations, but connecting investigations insights to corrections and rehabilitation broadens the scope of data management and analytics significantly.

Successfully delivering analytics capabilities at such a scale would have been virtually inconceivable only a few years ago. But recent experiences have proven that AI and machine learning capabilities are able to automate significant amounts of time-consuming, highly manual aspects of analytics, from data collection and management to low-level analysis and insight delivery, teeing up decisions requiring human insight.

In a law enforcement context, these capabilities are particularly important for their ability to accurately identify those who are most likely to cause the most harm – the “felonious few.” Today there is strong evidence that targeting a small number of repeat offenders for harm reduction strategies can have an outsized positive impact on outcomes. The AI capabilities that come embedded in today's more mature, sophisticated analytics solutions and platforms, such as those offered by SAS, can play an instrumental role here. But they must be activated by departments and agencies prepared to put them to work as part of an overarching strategy.

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Democratizing insight

In his book *The Rise of Big Data Policing* (2018), Andrew Guthrie Ferguson points to the four ways data and predictive analysis fundamentally change how liberal societies operate:

- Making police more proactive.
- Seeing violence as a public health issue.
- Highlighting the potential weakness in black-box algorithms.
- Surfacing data integrity issues.⁹

As Ferguson reported, high-profile investigations such as the Amnesty International review of the Metropolitan Police Gangs Matrix algorithms offer encouraging evidence that police and law enforcement agencies are seeking to regain the trust of communities. To increase transparency and accountability to the communities they serve, police and law enforcement agencies are using open data on calls for service, stops, arrests and crime. Spreading relevant insights to a wider range of non-expert analytics users is often referred to as the “democratization” of analytics, and it is a trend that industry and government alike are adopting as part of their pursuit of an analytics-driven culture.

In law enforcement, this has potentially profound implications for procedural justice, creating new opportunities for suspects and criminals to be treated in a contextually aware manner at every step of the criminal justice process. It is also a development that requires great care in both strategy and execution, due in large part to its reliance on big data and automation.

As Sarah Brayne, who spent four years working with the Los Angeles police and its **Palantir Gotham big data program**, describes in her 2020 book *Predict and Surveil: Data, Discretion and the Future of Policing*, big data and “surveillance technology” are not only expensive but can undermine public trust if applied improperly or indiscriminately. According to Brayne, “future work should examine the precise mechanisms through which big data surveillance and its associated scoring, sorting and classification schemes reinforce or reduce social inequalities.” The impact of these technologies in tandem with AI solutions is the subject of massive scrutiny today. For example, AI algorithms that are developed or deployed in a biased way can lead to a disproportionate focus on minority groups. This is avoidable – but only if law enforcement agencies recognize it at the outset and take steps to remedy it in the development, implementation and application of advanced big data and AI solutions. Evidence-based algorithms can and should be used in ethical ways to identify offenders, victims and locations that are most likely to be at the highest risk of harm.

Meeting the moment

Big data has quickly emerged as an integral component of the entire criminal justice spectrum. With more data available than ever before and more advanced solutions for making sense of it, it is not an understatement to say that big data is likely to play a

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⁹ The Rise of Big Data Policing (2018) Andrew Guthrie Ferguson

transformative role in criminal justice. In fact, it is already playing such a role in agencies and departments around the world. These organizations are undaunted by the volume of data surging through their systems because they know from experience that enterprise-class analytics and AI technologies are capable of managing and harnessing these large amounts of data. They also see the benefits: a significantly more effective, informed approach to pursuing those who cause the most harm, combined with a fairer, more equitable application of procedural justice. All of which leads to greater legitimacy, confidence and trust from the communities they serve.

Not only have agencies and departments been pursuing these goals for years, but today they are under more pressure than ever from the governments and communities they serve to make real, demonstrable progress on these fronts. Now that the solutions for doing so are finally within reach, will they rise to the moment? There are already encouraging signs suggesting real progress. It cannot happen fast enough.

Learn more about [Public Safety & Criminal Justice Solutions](#).

