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ABSTRACT

Purpose: The importance of multi-agency information sharing is recognised as central to tackling crime and disorder in an intelligence-driven environment. However, whilst technology can facilitate and enhance this process, barriers to effective agency information exchange are consistently reported. This paper aims to categorise how information sharing takes place in a law enforcement operational setting and whether there is scope to improve the process.

Design/methodology/approach: There were two stages to the method; firstly, a select group of practitioners with intelligence-related experience (n=28) were interviewed to identify the most common approaches to operational information sharing. This generated a categorisation model which was tested with a larger group of practitioners (n=73). A mixed methods approach was adopted.

Findings: The research found consensus surrounding four different approaches to information sharing, labelled as: i.) inform and request; ii.) meet and share; iii.) customised database; and iv.) integrated systems. These are used with various levels of frequency, dependent on the operational context.

Originality: This research provides original evidence-based research to show law enforcement practitioners vary in the way they share information. By demystifying and categorising the process it provides understanding for practitioners, policy makers and researchers, allowing barriers to be more readily tackled in a much more cost-effective manner.

INTRODUCTION

Tilley (2008, p.146) describes Intelligence Led Policing (ILP) as aiming "…*to reduce crime through the informed direction of enforcement agencies. Information is collected from a variety of sources, to produce 'intelligence'. This is then used to direct the activities of enforcement agencies in ways that enable them to disrupt, disable or undermine criminal behaviour"*. ILP became prominent in the 1990s, when UK policymakers realised that effectiveness and efficiency could be improved by targeting the small number of people and places associated with high levels of crime and disorder (Audit Commission, 1993). This was further improved by the UK National Intelligence Model (National Crime Intelligence Service, 2000) which was replicated across areas of Europe, the UAE, Canada, New Zealand and Australia (Brown, 2007; Ratcliffe, 2016). The 9/11 attacks provided further stimulus, especially in the US (Carter, 2018; Carter and Carter, 2009) where the National Criminal Intelligence Sharing Plan was launched. Similarly, the EU Hague Programme placed ILP at the heart of its five-year strategy (Council of EU, 2004).

However, implementation has always been challenging. The UK, North America and Australia have been affected by different priorities and jurisdictional influences (Carter, 2018), whilst practitioners across the world have been confronted by similar obstacles (Stark, 2016). This includes *direction* (leaders setting the intelligence objective and parameters); *collection and retention* (gathering and storing information from a range of overt and covert human and technical sources); *analysis and production* (interpreting and developing the information into a useable product); and *dissemination* (legal and ethical distribution of intelligence to relevant people) (Kirby and Keay, 2021, p.7). As the synthesis of virtual and physical environments has allowed people, money, and commodities to travel faster and further than before (Deloitte, 2018; Loubier, 2021), this has increased the potential for crime and avoidance of detection (Kethineni and Cao, 2020; Kirby and Penna, 2011).

The technology that facilitates criminality can also track physical and electronic traces left behind by serious and persistent offenders. This information can support accurate and timely intelligence products (i.e. network analysis, market profiles, subject profiles, risk analysis, trends analysis) (Kirby and Keay, 2021, pp.85-86). Nonetheless, identifying, analysing and sharing relevant material, in a timely fashion, whilst conforming to legal and ethical requirements is difficult. The aim of this study is to examine more closely how information sharing takes place in an operational environment.

LITERATURE REVIEW

During the 1990s, it became evident that law enforcement agencies could not tackle crime and disorder alone. Numerous studies identified that a small number of offenders, victims and locations were disproportionately associated with crime and disorder (Eck *et al.,* 2007; Farrell and Pease, 1993). The proclivity of these individuals and places often brought them to the attention of numerous agencies. For example, persistent offenders could be simultaneously monitored by education, probation, social and housing services, whilst organised crime offenders could be observed by customs, revenue, and border agencies. This means that to deliver effective outcomes a 'convergence of disciplines' is needed (Schuller, 2013); a concept recognised by government agencies who emphasise the importance of efficient information sharing in policy documents. This avoids duplication, improves governance and coordination, generates timely and accurate risk recognition, and enables early intervention. Researchers also point out that integrated information systems can provide more detail to assist collective decision making (Phythian and Kirby, 2022; Trevillion, 2001). Unfortunately, the link between policy design and practice often breaks down (Wilson and Gray, 2015), as agencies (including the police) struggle to share information effectively and efficiently. During the past three decades, the limited number of academic studies on the subject have generally been critical, highlighting technical, procedural and cultural obstacles surrounding the process.

Technical issues incorporate the design, implementation and maintenance of hardware, software, and infrastructure. Challenges can include cost (Asthana *et al.,* 2002), and the lack of compatibility across agency systems (Wilson and Gray, 2015). Whilst technical issues are important, they are rarely the main obstacle (Phythian and Kirby, 2022), with procedural or cultural tensions more prevalent. This is unsurprising. At a strategic level, different agencies (even within the same discipline) can have different priorities (Kirby, 2013), and be influenced by cultural differences (Lewandowski *et al.*, 2017). Legal concerns are also raised about the content and method by which information is shared, often aggravated by the multitude of information sharing protocols that exist (van Staden *et al.,* 2011). Trust is crucial in this process, as even when information sharing agreements are agreed, professionals may withhold information due to risk aversion (Pinkney *et al.,* 2008) or confidentiality concerns (Dawes *et al.,* 2009; Kirby and Keay, 2021). Trust can also be undermined when shared information is not acted upon or the results are not fed back (Feng *et al.,* 2010). Even when information is

shared, its quality may suffer due to incompleteness, over-sanitisation (van Staden *et al.,* 2011), or insufficient analysis (Wilson and Gray, 2015).

Due to these challenges, intelligence failures continue to occur and are associated with significant tragedies (e.g. Bichard, 2004; National Commission on Terrorist Attacks upon the United States, 2004). The high-profile inquiries that follow often lack specificity and repeat previous findings, pointing out errors in procedural or cultural practice. Solutions often propose further investment, building on existing approaches, rather than generating new methodologies. For example, fusion centres, which emerged following the 9/11 intelligence failures, introduced another tier of intelligence sharing, although this approach has also been criticised (Carter, 2015; Regan and Monahan, 2014; Taylor and Russell, 2012).

The challenges associated with effective and efficient information sharing are significant. Relevant information is scattered across various silos spanning many jurisdictions (local, regional, national) and agencies (i.e. health, border, tax revenue, commercial), which can also be subdivided by function (i.e. investigation, detention). Without understanding these nuances, it is difficult to comprehend the difficulty in transferring policy to practice. The academic literature recognises various forms of information sharing, including informal approaches or personal networks (i.e. Cotter, 2017; Lewandowski and Nestel, 2016), co-located agencies (i.e. Multi-Agency Safeguarding Hubs [MASH]; Shorrock *et al.*, 2020), and technology-facilitated (i.e. Phythian and Kirby, 2022). However, they are often considered in isolation and/or feature information sharing as one factor in a broader discussion.

Kirby and Keay (2021) recently highlighted a range of information sharing approaches. These included: a dedicated co-located multi-agency team (where representatives from partner agencies meet and share their own information, sometimes using bespoke databases); a lead professional model (where a partner representative acts as a coordinating case worker on a partnership issue); and live time integrated information sharing systems (which allow partners to interrogate specific information systems owned by another partner). Brown (2018, p.6) also proposed a "prototype information sharing matrix". This described 'interaction' as *connected* (the sharing of information from one law enforcement agency to another with limited communication) to *collaborative* (reciprocated information sharing between multiple agencies). This could occur *bilaterally* (between two agencies) or be *centralised* (information

is sent to data hubs, by multiple agencies or sources, usually in advance) or *networked* (agencies in a network store their own information and can access partner information). However, neither study based their views on empirical evidence nor explained why information sharing appears in different formats. This study aims to establish whether information sharing, in a law enforcement operational setting, does vary in approach, and whether these approaches can be accurately categorised. This would provide important detail in improving the effectiveness and efficiency of information sharing practice.

METHOD

A mixed methods approach was adopted, involving two stages of data collection and analysis. The first stage interviewed a select group of practitioners to identify the most common approaches to operational information sharing. The second stage tested the accuracy of these identified approaches with a larger group of intelligence practitioners.

Stage 1: Identifying approaches to information sharing and developing an information sharing model (interviews)

Participants and procedure: Policing is a broad concept and whilst the study predominantly uses respondents from police agencies, appropriately vetted representatives from other agencies with a law enforcement responsibility were included. Participants were recruited via professional networks, adopting purposive and snowball sampling techniques. They were invited to participate in either online (Microsoft Teams) or in-person semi-structured interviews or focus groups (i.e. with colleagues). Participants (n=28) included: police (61%, n=17; i.e. local, regional, national, and international units); NGOs or the commercial sector (21%, n=6; i.e. animal welfare groups, international technology company and FACT) and other government law enforcement agencies (18%, n=5; i.e. Border Force, HMRC, and Trading Standards). All participants were experienced practitioners with significant intelligence experience. Participant's roles ranged from Associate Director and Chief Police Officer to intelligence officer and analyst. Interviews were audio-recorded and transcribed verbatim.

Three questions were posed:

i. How important is information exchange in tackling cross border criminality, using a scale from 1 (not at all important) to 5 (critically important)?

ii. How well do law enforcement agencies currently share information, using a scale from 1 (very badly) to 5 (extremely well)?

iii. Describe the main approaches used when sharing information with other agencies (including other police forces).

As a prompt, they were provided with three formats of intelligence sharing, influenced by Kirby and Keay (2021), specifically:

a) you always maintain control of your information and only respond to specific requests.
b) you contribute to shared information databases, with specific partners, on specific problems, and
c) partners have access to your live operational databases (or parts of them) and have permission to interrogate them.

Analysis: The semi-structured interviews provided quantitative and qualitative data for analysis. The responses were quantitatively examined in SPSS to produce basic descriptive statistics, with accompanying qualitative content thematically analysed in NVivo (i.e. when participants offered a rationale for their rating). The thematic analysis followed a well-established six-stage method (Braun and Clarke, 2021), using both inductive (i.e. data driven) and deductive (i.e. theory driven) approaches. This involved generating initial codes semantically, for each of the three questions (detailed above), with the codes then collated into themes and the themes undergoing review and refinement. The researchers did this independently, and then collaboratively, to compare coding and discuss disagreements until a consensus was reached.

Four-format model: The findings from the semi-structured interviews were used to refashion the information sharing categories (adapted from Kirby and Keay, 2021) into the subsequent four-format model (detailed in the results section):

a) Inform and request format.
b) Meet and share format.
c) Customised database format.
d) Integrated systems format.

Stage 2: Assessing the four-format information sharing model (Sli.Do data)

Participants and procedure: The next part involved testing the accuracy of this newly established conceptual model across a larger number of practitioners. The researchers were invited to present the four-format model to delegates at the National Police Chiefs' Council's (NPCC) Intelligence conference 2022 (as per the description below). Delegates were invited to complete a 'live' online survey using 'Sli.Do' software. Two questions were asked:

i) Do the four approaches accurately describe information sharing in the UK? (Response options: Yes/No).

ii) How often do you use each of the four approaches: inform and request; meet and share; customised database; integrated systems? (Response options: never/ rarely/ regularly).

Participants were also provided with a free text facility to enter additional comments to both questions.

73 participants completed the questionnaire and 67% (n=49) disclosed their organisation and role. These comprised various ranks (i.e. Assistant Chief Constable, Chief Inspector, Sergeant, Superintendent), intelligence-related roles (i.e. Head of Intelligence, Intelligence Analyst, Director of Intelligence, Operational Coordinator, Staff Officer) and agencies (police, i.e. local, regional, and national units: 84%, n=41; NGOs or commercial sector, i.e. Crimestoppers: 10%, n=5; other government agencies, i.e. Environment Agency: 6%, n=3).

Analysis: Quantitative data was descriptively analysed (i.e. percentages) in SPSS. A content analysis was conducted on the minimal amount of qualitative data provided by 15 participants who added free text. Content analysis was used as it aims to "identify and record relatively objective (or at least intersubjective) characteristics of messages" (Neuendorf, 2002, p. 141). Each response was reviewed by the researchers who then discussed if/how the content influenced the proposed four-format model. Such content is included in the results to offer additional context.

RESULTS

The results follow the two stages described in the methodology.

Stage 1(a): Identifying approaches to information sharing (interviews)

Responding to the first question, 93% (n=26) [1] reported that exchanging information to tackle cross border criminals is 'critically important' (*rated 5*), with comments such as "c*ritically important, without a shadow of a doubt*" (P15). One theme emerged emphasising the importance of information exchange in 'enabling effective policing practice', where it was recognised as central to daily activities. Primarily, participants viewed exchanging information as vital in gaining a fuller understanding of an offender and/or crime, and to better protect both the police and public:

> "*It's hugely important… for… officer safety as well as the wider community… some of these people are extremely dangerous*" (P5).
>
> "*One, we can't combat the criminals if we don't know what's going on – without that information, we can't prevent it from happening. Two, we can't investigate it because how do we know who to look at? We need as much information as possible*" (P27).

The second question inquired how well participants thought information sharing was currently conducted. This showed considerable variance, with the 26 participants [2] offering a total of 37 ratings (i.e. one participant provided two ratings discriminating between national and international information sharing) (see Figure I).

[INSERT FIGURE I HERE]

8% (n=3) diverted from the scale, commenting that they would choose a minus number or zero (i.e. "*can I say minus 100*" [P15]), with 5% (n=2) rating information exchange 'between 3 and 4', and 3% (n=1) rating *strategic* information exchange 'between 1 and 2'. Three reasons for this variance were explained in the supporting comments.

First, participants stated that they shared information with other police forces much better than they did with other external agencies or international partners:

> "*From UK law enforcement out, I would say it's probably a 2 at best… Internally, because we have systems like PND, we can check what other forces are doing... I'll go 4*" (P13).
>
> "*The specifics is a 4, anything else that's not specific, I'd put it down as a 1 really. I'd put it really low internationally*" (P21).

Second, participants commented on how information sharing varied according to the individual and/or agency (or specialist team/unit):

> "*It's more reliant on the officer who deals with it… nationally, the sex offenders move around, sex offender units talk to each other. Brilliant. If you deal with someone who's a robber in London and he leaves London, unless someone actually checks where he goes, no one really [explores it further]*" (P13).
>
> "*I think the capability's there, but I don't think it's routinely done. Lots of forces search their own systems and rely on that… it depends on individual working practice and some forces are better than others*" (P22).

Third, participants said sharing tactical intelligence (which was needed to effect an arrest) was completed much more effectively than sharing general information:

> "*I think tactically can be 5. Strategically, it's 1 and 2*" (P8).
>
> "*It emanates from… 43 forces doing it 43 different ways… There's no strategic overview. It's just about that tactical delivery of surviving everyday… that strategic view of that global community, that global safeguard, just isn't there yet*" (P15).

In essence, the results show that whilst practitioners think information sharing is more likely to be done poorly than well, the ability to do so can vary according to the context.

The third question asked participants to highlight information sharing approaches and their frequency of use. Again, responses varied. Of the 24 participants [3] who provided a definitive answer, two approaches were most used: approach 'b', where practitioners engage and share information with specific partners on specific problems (52%, n=16), and approach 'a', where practitioners maintain control of their own information and only respond to specific requests (35%, n=11). The least commonly used format was 'c', where practitioners were provided with access to live databases from partner agencies (13%, n=4). One-third of participants reported using multiple approaches (n=8, 33.3%), commenting that "*it depends*" (P4) such as on "*a project-by-project basis*" (P26). The qualitative analysis identified three themes.

First, practitioners highlighted that effective information sharing was 'context-dependent'. For example, different decisions may be made if the requesting agency was a non-law enforcement agency, or if it related to specific crime types:

> "*It depends on what area… in domestic abuse… more towards b*" (P4).

Second, it was evident that many practitioners 'aspired to freely share information'. When discussing the benefits of approach 'c', P19 commented "*that would be my idea of heaven*",

and another argued that "*for law enforcement purposes, we should just be able to share freely*" (P27).

Third, despite a desire to freely share information, 'hesitancy' was also evident from others:

"*You don't want to be too much onto c because you would be oversharing*" (P7).

"*It's definitely not c. Because, you know, we couldn't have that*" (P17).

Stage 1(b): Developing the information sharing model (interviews)

The interviews provided considerable information to review and develop the model. First, 'reactive' approaches continued to be common in information sharing:

"*We're still reactive to some of the changes within how serious organised crime works"* (P8).

Second, 'personality-based approaches' appeared commonplace, as information requests were often dictated by individual discretion and involved informal routes utilising known individuals. This led to an 'inform and request' format being included in the final information sharing model. Quotes included:

"*Loads of it is personality driven*" (P4).

"*Personality, and how it can be just down to that kind of raffle, because people get on better with certain other people*" (P18).

Third, the interviews revealed the importance of 'relationships'. This went wider than individual personalities as many success stories involved close partnerships, where well-known representatives of an organisation generated a track record of trust and solving mutually relevant problems:

"*We have formal procedures... But equally, if you pick the phone up, they'll tell you that it's there… But you need to have that trust first and you need to know who to call*" (P7).

"*it's very much about having that almost immediate operational interdiction, so quick, real time, more informal and very much relies on those personal relationships*" (P18).

Consequently, the 'meet and share' approach was also introduced to distinguish between ad hoc relationships and more formal processes.

In summary, the results from this stage generated four categories of information sharing, which can be described as follows:

Format 1: '*Inform and request*' is the earliest and most traditional method of information sharing. It evolved when offenders began routinely crossing jurisdictional borders, with no system in place to pass information consistently or proactively. Thirty years later this reactive approach remains prevalent as agencies (either informally or formally) publish information in anticipation of a response, or directly approach a specific agency with a request.

Format 2: '*Meet and share*' is where trusted and invited agencies convene in a physical or virtual environment to form an information sharing partnership. They can involve full-time dedicated teams or part-time representatives. These partnerships normally operate under a formal information sharing protocol. Agency representatives maintain exclusive control and access to their own system. Information provided to other partners is in response to a specific question or deemed relevant regarding a subject of mutual interest.

Format 3: '*Customised database*' goes beyond the 'meet and share' format. Again, representatives from partner agencies collaborate to tackle a mutual problem. However, in this format they use a bespoke database to pool information on specific topics or individuals. These information systems are isolated from other operating system and allow any partner to analyse the pooled information as they wish. This approach is most often seen in 'project-based' partnership working.

Format 4: '*Integrated systems*' can be viewed as a step change in information sharing philosophy and practice. This enables an agency to directly view, in real-time, another agency's existing system (or part of a system). It is the purest approach to multi-agency working as it allows an agency to search any information within a partner's system (often within specific parameters), offering insight into wider patterns and trends.

Stage 2: Assessing the four-format information sharing model (Sli.Do data)

These formats were presented to the conference delegates who were then asked to complete the online survey. 92% (n=67) of participants reported that the four formats accurately described the current status of information sharing. Nine participants provided free text remarks to supplement their views, including:

> "*There are often hybrids of these systems – Meet and share, leading to [inform] / request – often caused by inflexibility of information sharing agreements (e.g. yes we hold that information, but you need to request via formal route)*" (P44).

"*Integrated systems are very difficult to establish*" (P49).

Others spoke generally about the challenges of information sharing, such as the "*reluctance*" (P38) of practitioners to share, and concerns about data quality, caused through "*double keying*" (P8).

8% of participants (n=6) indicated the four approaches were not sufficiently accurate and provided an explanation. However, on inspection, these did not negate the four approaches. For example, P2 stated, "*You need to include cloud-based services*", however using the cloud simply provides another way to collate information (which three of the four approaches could utilise), rather than introducing a different format. Similarly, P60 explained that whilst a specific type of risk assessment is shared, the information on which it is based is not. Again, sharing an intelligence product fits all four approaches and its content is immaterial. P65 felt that "*Informal through back door via relationships – the unofficial route*", was missing; however, this is mentioned as an element of format 1, 'inform and request'. Finally, P29 spoke of "*Asynchronous sharing, a variant of [a customised database] that is bias toward one party*", and whilst recognising the point, it was thought the nuance could be accommodated using the existing 'format 3' approach.

The participants were also asked which format they used most frequently (see Table I). This question was perhaps the most illuminating in terms of discriminating between the different approaches to information sharing.

[INSERT TABLE I HERE]

The most regularly used format is 'inform and request', representing the most basic method when sharing information. The second most frequent approach is 'meet and share', which has become a popular model, especially when formal partnership information sharing agreements exist. This involves partner representatives meeting, physically or virtually, and sharing information on specific people or locations. The other two approaches are less commonly used. The 'customised database' approach was only regularly used by fewer than half of all participants, whilst 8% had never used it. Similarly, the 'integrated system' approach was regularly used by only 30%, with 22% having never used it.

DISCUSSION

Since the 1990s, the concept of ILP has risen in prominence, with multi-agency information sharing becoming critical to its success. Whilst considerable progress has been made, intelligence failures continue, often leading to catastrophic consequences. Investigations to establish the reasons for these malfunctions have often highlighted agency failure in both procedural and cultural practice (e.g. Bichard, 2004; National Commission on Terrorist Attacks Upon the United States, 2004). Academic studies are limited often due to the difficulty in accessing sensitive material. However, those that exist regularly criticise the efficacy of information sharing and treat information sharing process as a singular activity, rather than a multi-faceted and dynamic process. This has meant academic insight and government inquiry is often limited to highlighting failures, rather than finding solutions. As a result, responses often involve increased investment to supplement legacy models and approaches. Ultimately this has diminished the ability of law enforcement agencies to tackle persistent offenders, who exploit 21st Century technology and mobility.

This study sought to build upon the knowledge of previous studies concerning information sharing. First, as with other studies, it showed practitioners view information sharing as critically important when tackling offenders who transcend borders and accept that operational performance could be improved. However, this paper also provided original insight. It provides empirical evidence to show that information sharing can occur in different ways, and the context in which it takes place can affect the outcome. This was initially highlighted in the semi-structured interviews, which showed the ability to share information was dependent on the type of information being shared (i.e. tactical information was communicated more effectively than strategic information), or who it was shared with (communication was more effective with nationally located police agencies than those located internationally, or enforcement agencies external to the police). These findings endorsed the belief that information sharing occurs in different ways and specific contexts are more facilitative than others.

The study also revealed it was possible to categorise different formats of information sharing. Four formats were developed and presented to experienced intelligence practitioners who said they accurately encapsulated the most common methods of information sharing. Further, the few who questioned their accuracy did not produce an approach that was tangibly different, rather they provided nuances on existing formats. Intelligence professionals also indicated

these formats occurred with different levels of frequency. The 'inform and request' approach was the most common, and whilst the easiest to conduct, it is reactive, requires significant number of people, and is probably the least effective. This is because the approach is reliant on asking the right question to the right people and hoping a response is received in a timely manner. Further, as this method can rely on the discretion of individual personalities, its efficacy can change as staff move role or location. The most common proactive approach was 'meet and share', a method increasingly prevalent across the world. It emerged in the UK during 1988, with the establishment of Youth Offending Teams (YOT), which corralled representatives from police, probation, children's services, and education together. It was followed in 2011 by the UK MASH (Dunne and Finlay, 2016). Studies argued co-location improved information sharing as it generates trust and confidence, encouraging reticent agencies to accept their responsibility and contribute (Ramsay, 2009; Shorrock *et al.,* 2020). However, more critical studies highlight its flaws, pointing out that agencies remain in cultural silos which promotes risk aversion. The Health and Social Care Information Centre (2012) found MASH often deferred decisions, reporting that 29% of referrals resulted in 'no further action' and a further 28% resulted in continued monitoring. Nonetheless, this 'meet and share' format is commonly seen in law enforcement, being used by Europol (located in the Hague) and fusion centres in the US. However, these approaches are also resource intensive (in human and structural costs) and agency representatives remain as the arbiter as to what to share and how to share it.

A 'customised database' format is one step further in terms of sophistication. As with 'meet and share', the foundation of the approach relies on a virtual or physical team tackling a specific problem. However, the approach is supplemented by a bespoke database, which is used to collate relevant multi-agency data. In the UK, several electronic systems have been designed by commercial software developers. They have been particularly useful in consolidating projects involving law enforcement and partner agencies, especially on a regional basis when local boundaries are transcended. Once data is entered onto the system, partner agencies are normally allowed to analyse it at will. The UK Organised Crime Group (OCG) mapping system follows a similar approach, as individual police forces upload local OCG data, which is then aggregated to provide a national overview. The downside of such a process is the manual transfer of information onto the database (double keying) increases the level of resources and can generate inaccuracy.

The 'integrated system' approach is the most sophisticated approach, the most complex to organise, and the least used format. In essence, it is highly reliant on technology to allow a partner agency access to another partner's database (or part of it). The obvious benefits are that it requires no extra effort to supply the information, as it is already on the system. Further, it allows the partner agency complete flexibility to interrogate the available information in the way it chooses. This permits the partner agency the ability to explore wider patterns in relation to subjects of interest. One of the best international examples of this is the UK Police National Database (PND). Since 2011, it has enabled UK police agencies to view 230+ linked local crime, custody, domestic abuse and child abuse records. This provides a more complete picture of people (e.g. offenders), objects (e.g. stolen property), locations (e.g. address) and events (e.g. a crime report) (Lambri *et al.,* 2011) even when crossing borders. Whilst the PND shows the technology exists to provide innovative information sharing systems, there are significant challenges and hardware costs (Phythian and Kirby, 2022). However, the main obstacle appears to come from practitioners who express caution about sharing information to this degree. As Lum *et al.* (2017) argue, when IT facilitates organisational change, it must take account of the associated cultural challenges.

The study findings also illustrate the complexity of the intelligence process. Consider England and Wales, which has 43 autonomous police forces, each divided into numerous policing units, which host an intelligence unit. They are expected to coordinate intelligence with a diverse range of external partners at local (i.e., health, housing, social services, and education), regional and national levels (i.e. Border Force, HM Revenue and Customs, National Crime Agency). Whilst the study focuses on the UK, these information sharing challenges are transferrable to ILP practitioners across the world. In essence, there are an infinite number of people generating information, sifted by hundreds of intelligence units, and thousands of dedicated intelligence officers, often using incompatible systems. In countries, such as the US, who experience greater decentralisation and, as a result, often host smaller law enforcement organisations, these issues are more acute and may consume greater resources. However, the same principle applies – how can information be shared in the most effective and efficient way? Whilst organisations provide training and hardware, the approach to identify, analyse and share information in a timely fashion is often left to individual decision making and therefore open to error and inefficiency. Increased study on information sharing helps to understand the complexity of this process and opens the door to improvement.

Ultimately, the drivers for improving effectiveness and efficiency are unambiguous. The quality and quantity of criminal intelligence has grown exponentially and requires processing at a faster speed if intelligence opportunities are to be seized. Information sharing processes currently require a multibillion-dollar investment, which is only set to increase. Intelligence failures are often explained through the inability to share the information, rather than the lack of information. Demystifying the information sharing process simplifies understanding for practitioners, policy makers and researchers. At an organisational level it enables ineffective process and poor cultural practice to be more easily identified and tackled, reducing unnecessary cost and duplication. This and other studies show technology is available to securely link multi-agency intelligence databases and provide vetted personnel with targeted access. Similarly, algorithms exist that can search large databases and conduct analysis to show trends and connections. This can free up staff time allowing them to use their knowledge and skills in more innovative ways. This would be beneficial to any law enforcement agency, but especially useful to decentralised units who require a disproportionate level of human resources to process information. Whilst the study accepts law enforcement agencies work in a challenging environment it argues research and evidence should drive policy and practice, rather than individual personalities or inherited cultural practice. Information sharing processes are not scrutinised in any detail and the researchers found no evaluation process used by practitioners as to their efficacy. By setting out these four models of information sharing and showing the arbitrary nature of their use, individual approaches can be examined in more detail. At the outset, managers should question why a specific information sharing process is used in a specific context. When this is supplemented with an understanding of the resources needed to deliver a specific information sharing process and the outcome it delivers, it provides a route to increase benefit realisation.

Conclusion

It has been said that offenders and law enforcement agencies are in a crime related 'arms race' with each side trying to outdo each other (Ekblom, 2003). In this race, the 21st Century has afforded serious and persistent offenders with unprecedented criminogenic opportunities. Whilst offenders may leave clues in the form of physical and electronic traces, this can only be useful if the relevant agencies identify relevant information and share it with those who are able to use it. As such, effective information sharing is critical and data management will become an increasingly important capability for law enforcement agencies. Unfortunately,

progress has been slow. Historically, public sector information systems have been constructed for the purpose of internal administration, rather than the facilitation of criminal investigation and prevention. More illumination as to how information can be utilised to tackle crime and disorder in an operational setting is necessary if progress is to be made. Only by choosing the most efficient and effective information sharing process can law enforcement agencies hope to tackle the proliferation of more sophisticated offenders.

NOTES

1. One participant opted for the mid-point (*rated 3*) and a further participant did not provide a response.

2. Two participants failed to provide a grade (one participant said they were 'unsure' and one participant noted that it varies, depending on the context).

3. 14% (n=4) of participants failed to provide a specific answer. Of those who did (n=24), 31 ratings were offered (i.e., several participants identified multiple modes of information sharing).

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Figure I. Ratings in response to "how well do law enforcement agencies currently share information?"

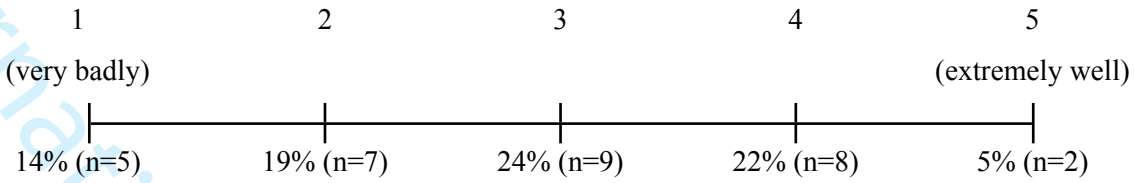

Table I. Frequency of information sharing approach

	1. Inform and request	2. Meet and share	3. Customised database	4. Integrated system
Never	N/A	N/A	8% (n=6)	22% (n=16)
Rarely	8% (n=6)	23% (n=17)	52% (n=38)	48% (n=35)
Regularly	92% (n=67)	77% (n=56)	40% (n=29)	30% (n=22)