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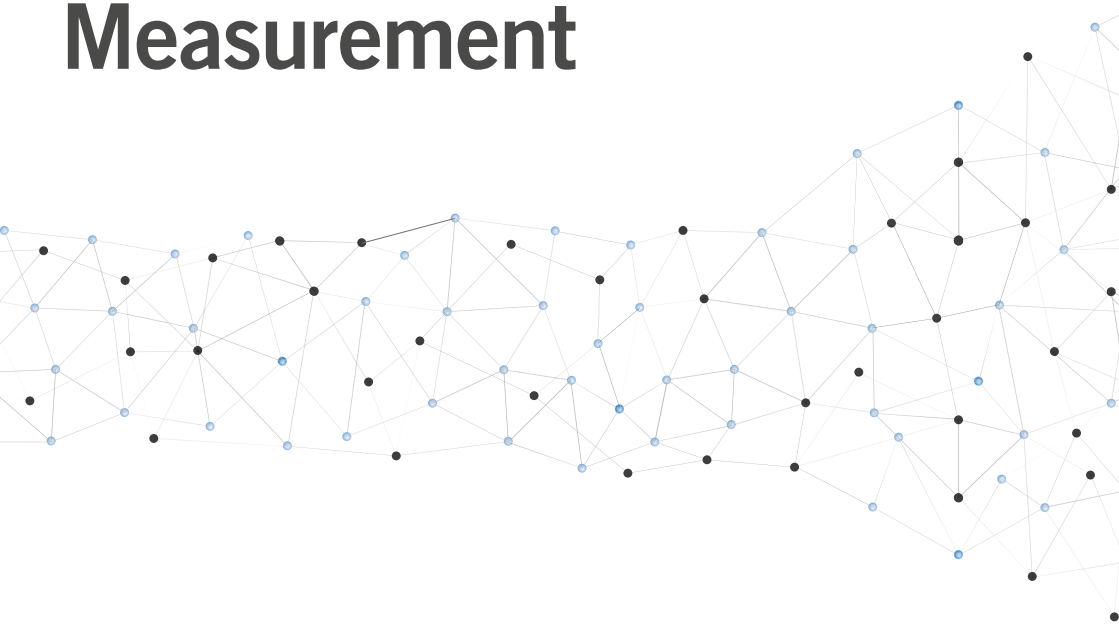
Mobile Technology in UK Policing: Benefits Identification and Measurement



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- "Policing, Information and Technology in the UK: A National Survey", providing a national picture of the use, delivery, and challenges of ICT and information management in policing;
- "Delphi Study: Technology and Transformational Reform in Policing - Barriers and Enablers", providing findings from a Delphi research study exploring UK policing in the context of the barriers and enablers of technology and transformational reform;
- Ten cases studies exploring five themes:

    1. Social Media
    2. Predictive Analytics
    3. Performance
    4. Mobile Technologies
    5. Information Technology Sourcing / Outsourcing

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Contents

List of Tables

Executive Summary

This report presents research findings which illuminate the benefits and measurement of mobile technology in UK policing. The study forms part of the wider *Information, Technology and Policing Research Project 2016-2017* undertaken by the AIMTech Research Centre at Leeds University Business School, University of Leeds.

The findings presented here report on current practice in the evaluation and measurement of the influence of mobile technology in UK police services. The research was undertaken using semi-structured telephone interviews with representatives of all the UK terrestrial Police Forces. The key output from this study was the identification and validation of a benefits framework composed of the following seven measurement themes:

1. Cost reduction
2. Data quality into systems
3. Managerial control
4. Co-ordination and communication
5. Working life
6. Response
7. Force strategy

The themes were developed from earlier research undertaken by colleagues from AIMTech and elsewhere. The results from the 2017 data indicated congruence between the areas modelled and the expectations of Forces. Therefore, taken together, the measurement and benefit themes offer a conceptual framework for understanding mobile technology in contemporary policing environments.

Introduction

Smart phones, tablets, laptops and other networked devices are now part and parcel of the work of almost any organisational fieldworker, from repair agents through to postal delivery staff. In policing, while mobile data systems (in some form) are now deployed to most officers in the UK, the type, distribution and use of devices differs between Forces and the purposes for which they are applied differ radically. There are two enduring questions posed by police services which seem to impede further implementation and development. The first is *'what are the benefits of using mobile data?'* The second is *'how can we measure the benefits of mobile data?'*

The first question seems at first sight one which is quite easily answered. For many Forces, the response has been simply that these technologies form an essential element of a modern workplace. As one respondent in this survey indicated, having to explain the benefits of mobile technologies is *"like having to justify the use of electricity in that the benefits are both self-evident and flow from the use to which the technology is put, not from the technology itself"*. As public sector organisations Forces do, however, have to account for their expenditure and a number of Forces have experienced problems in both identifying benefits from earlier deployments and justifying expenditure. The second question is also proving challenging to UK Police Forces - where the lists of benefit areas have been developed by Forces, they have had little commonality and have often proved difficult to evidence. In this report, we discuss the results from our research in relation to these two questions in light of survey work undertaken in 2004, 2006 and 2017. We begin by focusing on business case development followed by a historical overview of benefit areas identified in 2006 and 2007. We then present the results from our 2017 survey as they relate to benefit areas, measurement and metrics and other ways of capturing knowledge about the influence of technology.

Business Case Development

A business case sets out the rationale for investment in technology and the metrics that will be used to measure the success of the implementation. It plays a key element in the project management process and is, or should be, developed before the project is initiated and then updated and reviewed as the project proceeds. In 2006, we were only able to identify a small number of business cases which addressed benefits models. By 2017, however, 95% of Forces (38 Forces) had developed business cases for their mobile projects, addressing benefits models explicitly. Of those that had developed a case, 89% (34 Forces) developed these pre- implementation and 11% (4 Forces) during the implementation process.

The results from the survey indicate, however, that the format, content and purpose of the cases developed varies considerably from Force to Force. For some, it is a detailed document. One Force, for example, indicated that it had produced a comprehensive case: *"The business case came to our Chief Officer Group, there was a finance case, a commercial case and an operational case all wrapped up in the paperwork".* Another noted that their business case has external scrutiny and was a publicly available document involving:

"…industry peers coming in from the public sector and private sector, interviewing people, examining the benefits and thereafter publishing reports about it."

Another Force indicated that they used *"two lots of external consultants with expertise in business case and benefits to help us develop them…so we did a lot of background work, including with the University of [Name removed], which had extended through to not just a trial or pilot phase before full procurement, but it had also included things like going through the timeline of a specific type of transaction…So it was a fairly in-depth look, using the standards that are set by the Treasury green book…"*

Other Forces, however, saw the document just as something that needed to be produced to gain support, and only used as a 'touch stone' document to refer to if needed. A number of respondents indicated that a full business case wasn't seen as a necessary precursor to development and implementation. One respondent stated:

> *"…if I'm being brutally honest about it, this has been one of those things which is 'this is the thing that we must do', we're moving into a digital era, our partners expect it, our customers expect digital, everything digital so this is a no brainer. Obviously there's an investment profile involved in it at the beginning so yes, there is a benefits model and there was a business case done but this was more around, 'it will happen' kind of thing, not 'it's not going to happen', we don't really have a choice, this is something we have to do in terms of modernising so… if you want the purist view on what was a typical project management cycle, in terms of how a brief outline business case, full business case, I would say no…"*

The content of business cases and the time spent in collecting supporting evidence also seems to differ considerably, with one respondent noting that the rationale related to one primary business need which provided the initial impetus for the investment: *"We used Home Office figures that had calculated if you deliver mobile to the front line you will save about 18 minutes a day".* The majority of the Forces that responded to this question indicated that they were focusing on a limited set of factors which were mentioned in their business case. As one respondent stated: *"The primary factors were to improve the officer experience as one of the key factors…".*

Forces indicated that the business cases were used in very different ways. In some Forces respondents indicated that it hadn't been used beyond the initial decision to fund the mobile project. In others, it was used as a tool to manage the scope of the project and ensure that the project delivered on its key performance indicators. One respondent indicated that they used it *"as a reference tool to make sure that we stay on target with the objectives of what this project is to deliver".* Another pointed to the business case as the *"bed rock of the implementation"* and another stated that it was key to ensuring control of the project: *"The difficulty with technology is there's always something new and shiny over the horizon, that you slip out of a business case and you end up then spending an extra…".* A further Force indicated that they were taking a 'stage gate' approach to the implementation of mobile technology with each stage of deployment being associated with a set of measurable benefits which needed to be met by the end of a stage to proceed further.

Those that hadn't developed a business case (2 Forces) stated that they felt that it was too early into their deployment of mobile technology, or that mobile technology had been integrated into a wider change programme, and that the rationale for investment and measures were incorporated within that programme level documentation.

Benefits Identification 2004 and 2006

In our 2004 survey most Forces deploying mobile technology indicated that the benefits were 'self-evident' and related to visibility, productivity, response times, communication and management control. They saw the use of the technology as leading to significant organisational change. In contrast the data from this current study suggests that Forces are now using the technology to incrementally improve existing ways of working rather than focusing on radical change.

One of the key points from the 2006 study was the recognition of the importance of the link between the approach to policing taken, and benefits to be recognised and realised. We identified two underpinning approaches or motivations, each pointing to particular sets of expected benefits and limitations. The first emphasised remote command and control and the second empowerment. The command and control approach focused on the use of the technology to measure and monitor and manage officers on a micro basis. This was seen as reducing risk, allowing greater control and leading to efficiency gains. In this model, the officer required only limited access to information recording and processing. In its most extreme form it limited officers' autonomy and discretion, undermined the existing supervisory models, and did not support a team-based approach to work. The second approach focused on providing richer forms of information to officers in order to increase their decision-making capabilities. The aim of those using this approach was to provide remote access to information and systems that allow the officer to become more knowledgeable and informed and therefore more effective within the community (Allen, Norman 2004: 9).

As we will suggest later in this report, while these two approaches are not mutually exclusive there is a tension between them which is still present in current mobile technology deployments. In our 2004 study we categorised benefits into the following twelve areas:

1. Increased productivity
2. Visibility and autonomy
3. Speed of reaction
4. Increased job satisfaction
5. Improved control of situations
6. Better teamwork
7. Increased productivity
8. Greater security for officers
9. Improved communication within the Force
10. Improved informal information sharing
11. Reaching performance targets (number of arrests, solved crimes, etc)
12. Improved relationships with the public

Some of the respondents recognised that these benefit areas were not necessarily discrete and were instead inter-linked. One respondent noted, for example:

> *"The flow of information from a Stop and Search could, (in some Forces), take weeks before it was input by the LIO, equally a witness statement could take days or weeks before it was indexed into HOLMES 2 on a major incident. The use of mobile data systems to input data directly into systems was seen as a benefit of mobile data systems which improved the speed of reaction and the effectiveness of police reactions."*
>
> *(Allen, Norman 2004:11)*

In our 2006, survey Forces indicated that they were now focusing on a very limited and specific set of areas of gain. These were:

1. Increased time out of station: This was normally equated to increased visibility and was often then multiplied by the average cost of an officer/hour to arrive at an efficiency saving figure. In 2006 this was often quoted at between forty minutes and one hour per officer per shift.

2. Time efficiencies responding to incidents: Improvement in the time needed to arrive at incidents as a result of a combination of AVLS data being used in dispatch and satellite navigation being available in vehicles.

3. Speed of sharing information: Improvement in the time required to submit forms / data resulting in more information being available to the Force in a more timely manner. An example was the use of mobile forms to improve the submission time for one form from over two hours to under 30 minutes.

4. Reduced travel: Reduced levels of travel as a result of reducing the need to return to police stations to carry out checks, input information and access systems such as E-mail. Improved dispatch was also mentioned as a factor here. Taken in combination with AVLS data pinpointing the use of vehicles one fleet manager estimated that he could reduce vehicle deployment cost between 5% and 10% over two years by keeping vehicles longer, and making better use of a smaller number of vehicles.

5. Improved data quality: Increased accuracy in data input as a result of not having to interpret handwriting, eliminating rekeying of information or accessing information by the use of an information intermediary in a Police Station or Force.

6. Increased information checks: Increased number of PNC checks as officers are able to run checks whilst the FCC (Force Control Centre) is busy and will also run checks where they previously may have judged that it was not 'worth' taking up FCC time. One Force with a wide mobile data deployment estimated that they were seeing on the order of an additional 50,000 PNC checks a year as a direct result of providing officers with access to mobile information capable devices.

7. Reduction in voice traffic: Reduction in voice traffic reducing the Tetra Airwave busy hour and thus reducing the cost of the Tetra Airwave system to the Force. This has proven to be hard to measure in the Forces that have attempted to do so. This is partly based on moving voice queries to data and also on eliminating check calls.

8. Improvement data quality and quantity: Improvement in the quality and quantity of information with which officers arrive at an incident as a result of making logs accessible to officers on deployment.

Benefits Identification 2017

Methodology

In our 2004 study interviews of groups and/or individuals were conducted in thirteen Forces, face-to-face interviews in a further seven Forces and telephone interviews were carried out in the remaining Forces in England and Wales. In addition, visits and/or telephone interviews were made to hardware and software suppliers and to telecommunications providers. We also interviewed IT staff and senior officers involved in the deployment of technology and, where possible, also interviewed users. The study was intended to be qualitative because it was intended to complement a separate project being undertaken by The Police Information Technology Organisation (PITO) which would gather quantitative data.

In 2006 we undertook a follow-on study supported by the National Police Improvement Agency (NPIA). In this study telephone interviews were conducted with all Forces. Site visits were also undertaken in the following 11 Forces: Merseyside, Strathclyde, West Yorkshire, Lancashire, Thames Valley, British Transport Police, North Wales, Surrey, West Midlands, Metropolitan Police, and Bedfordshire. At this point, each of these Forces were identified by PITO /NPIA as leading in the development of mobile data. The Forces were visited by a researcher with a view to gathering feedback from a range of key parties involved in the deployment. The visits comprised a mix of interviews and observation of the technologies in use.

For the 2017 study we built upon the question sets used in the 2004 and 2006 studies to develop two semi-structured questionnaire sets, one focusing on the technology perspective (22 questions) and one focusing on the operational perspective (18 questions). Information was collected via semi-structured telephone interviews using a mix of qualitative and quantitative questions. All UK terrestrial Police Forces (with the exception of PSNI) were contacted in advance to allocate the necessary time and identify the correct people to speak to during the interview process. The research aimed to obtain two separate interviews per Force with very different perspectives – a technology perspective and an operational perspective. In total we were able to undertake 88 interviews. Overall response rates were very high: 100% of UK terrestrial Police Forces (44 in total) were consulted in this research by interviewees reflecting views of their own Forces or in a small number of cases, multi-Force or tri-Force perspectives where such technological or operational arrangements existed. When considering the response rates gained for both technology and operational perspectives, a 96% response rate was gained, with 84 of the 88 potential Force interviews covered.

Key Findings

In our current study, we drew upon earlier work undertaken by AIMTech and others on the deployment of mobile technologies in policing to identify potential areas where mobile technology could influence organisational performance. These were categorised into the following seven interlinked themes which form the basis of an overall framework to understand the influence of technology on policing:

1. Cost Reduction (7 areas)
2. Data Quality into Systems (10 areas)
3. Managerial Control (7 areas)
4. Co-ordination and Communication (6 Areas)
5. Working Life (6 areas)
6. Response (9 areas)
7. Force Strategy (6 areas)

The results from the 2017 survey data indicate congruence between the areas modelled and the expectation of Forces. Of the 51 sub-areas investigated 43 were ranked by 50% or more as 'likely' or 'very likely' to be realised. Overall, this suggests that the model does have some efficacy and could be used by Forces to help understand the influence of mobile technologies on their organisation.
The results also point to some specific areas where it would be reasonable to expect all Forces to see a change in performance.

It is important to note, however, that Forces are starting from very different positions in terms of technological base, experience in use, scale of deployment and organisational need. The benefit areas that they are focusing on will inevitably differ. Equally, the Forces will recognise very different combinations of benefit areas. This is illustrated by the following quotation from one Force which identified a range of strategic motivations for deployment, and that mobile technology was part and parcel of other change initiatives:

> *"The fact we were anticipating major ongoing cost reduction from 2010-2015 as part of the austerity budgets, and then the expectation it may go from 2015-2020, so we realised we had to create a more agile, more flexible, more productive workforce with way fewer people and we had to bridge that gap and our plans for mobility were one of our key plans to do that."*

We also noted that Forces indicated that the measures and benefits areas selected are tailored to the interest of the audience. One respondent noted that the:

"Police and Crime Commissioner who ultimately holds the purse strings, actually their approach has changed which has meant that our approach has had to change. So then what we do is we identify some pretty high-level benefits in it, but they tend to be very much around money and people, not really around efficiency in terms of process changes."

We would also note that as police roles and work activity are disparate a differentiated approach needs to be taken to the model. The data gathered on each of the sub-areas within the themes is, however, illuminating and suggests an overarching framework or model for evaluation.

Theme 1: Cost Reduction

The first theme identified was cost reduction. Forces have put forward a range of ways in which the use of mobile technology can provide them with the capability to reduce operational costs or capital expenditure. A total of 65% (or over) of Forces indicated that they were 'likely', or 'very likely', to realise the following benefits:

Cost Reduction Areas	Percentage Likely or Very Likely to Realise Cost Reduction Benefits	Total Number of Respondents
Reduced reliance on paper	85% (35 Forces)	n=41
Reduced use of fixed IT infrastructure	73% (29 Forces)	n=40
Reduction in use of fixed line telephone	72% (28 Forces)	n=39
Enables reduction in support staff (automation)	70% (28 Forces)	n=40
Enables release of estates	65% (26 Forces)	n=40
Enables reduction in number of warranted police officers	29% (12 Forces)	n=40
Reduced fleet costs	29% (12 Forces)	n=41

Table 1: Forces Likely to Realise Cost Reduction Benefits

It is worth noting there is a 41% difference between technology enabling a reduction in support staff (70%, 28 Forces) compared to technology enabling a reduction in warranted police officers (29%, 12 Forces). This suggests there could be a significant change in the approach to how policing is delivered and supported in future.

Theme 2: Data Quality into Systems

The second theme was data quality into systems. While much of the emphasis has been on the transfer of information to the officer, improvements in the flow of information into Force systems are equally important and allow more rapid decision making as well as providing information and data which can help improve the quality of decision making. In this area over 70% of Forces indicated that they were 'likely', or 'very likely', to realise the following benefits:

Data Quality Areas	Percentage Likely or Very Likely to Realise Data Quality Benefits	Total Number of Respondents
Improved data quality into Force systems – Timeliness	90% (37 Forces)	n=41
Improved data quality into Force systems – Completeness	88% (36 Forces)	n=41
Improved data quality within shared police systems	87% (34 Forces)	n=39
Improved data quality into Force systems - Relevance of the format (e.g. paper to electronic)	85% (35 Forces)	n=41
Digital capture of new forms of data: Photographs	83% (34 Forces)	n=41
Digital capture of new forms of data: Video	80% (31 Forces)	n=39
Improved data quality into Force systems – Accuracy	78% (32 Forces)	n=41
Improved data quality into Force systems - Appropriate presentation	70% (28 Forces)	n=40

Table 2: Forces Likely to Realise Data Quality Benefits

49% (19 Forces out of 39) indicated that it was 'likely', or 'very likely', that they could realise benefit from digital capture of new forms of data including voice (e.g. interview recordings), whilst 60% (24 Forces out of 40) indicated that they were 'likely' or 'very likely' to realise the benefit of providing improved data quality to partner organisations in the criminal justice system.

Theme 3: Improved Managerial Control

Improved managerial control was the third theme identified. This has been described as a key area in which mobile technology can benefit police services. In the 2017 study, however, only sub areas were recognised by 65% or more of Forces as ones in which they were 'likely' or 'very likely' to realise benefits.

- Better ways of deployment 80% (31 Forces out of 39)
- Briefings and actions tracked more effectively 77% (30 Forces out of 39)

This area of managerial control was the most surprising in terms of areas not identified by the majority of Forces. Only 49% (19 Forces out of 39) felt that it was 'very likely' or 'likely' that they would be able to realise the benefit of better control of working hours of officers, and only 40% (16 Forces out of 40) believed that it was 'likely' or 'very likely' that they would be able to realise the benefit of improved co-ordination with other agencies through direct access to systems (e.g. Court Schedulers' access to information about the availability of police officers). 38% (15 Forces out of 39) indicated that they would be likely to realise the benefit of increased ability to smooth peaks and troughs in working and only 18% (7 Forces out of 38) indicated that it was 'likely' or 'very likely' that they would be able to realise the benefit of more effective provision of cover for sickness.

Theme 4: Co-Ordination and Communication

The fourth theme identified was that of co-ordination and communication. In this area over 80% of Forces indicated that they were 'likely', or 'very likely', to realise the following benefits:

Co-Ordination and Communication Areas	Percentage Likely or Very Likely to Realise Co-Ordination and Communication Benefits	Total Number of Respondents
More informed officers: Increased use of existing Force information/ applications	100% (40 Forces)	n=40
More informed officers: Increased use of external information sources	90% (37 Forces)	n=41
Improved communication within the Force	90% (36 Forces)	n=40
Reduced load on Control Room	80% (33 Forces)	n=41

Table 3: Forces Likely to Realise Co-Ordination and Communication Benefits

58% (23 Forces out of 40) indicated that they were 'likely', or 'very likely', to realise the benefit of improved communication with other agencies and 23% (9 Forces out of 40) indicated that they were 'likely', or 'very likely', to realise the benefit of improved communication with private sector partners.

Theme 5: Response

The fifth theme that we explored was that of response. In this area over 75% of Forces indicated that they were 'likely', or 'very likely', to realise the following benefits:

Response Areas	Percentage Likely or Very Likely to Realise Response Benefits	Total Number of Respondents
Increased productivity	98% (39 Forces)	n=40
Customer Service: More accessible	95% (37 Forces)	n=39
Customer Service: Overall improved handling of tasks in front of public	95% (37 Forces)	n=39
Customer Service: More time with victims	85% (34 Forces)	n=40
Speed of reaction	83% (33 Forces)	n=40
Customer Service: More information for victims	75% (30 Forces)	n=40

Table 4: Forces Likely to Realise Response Benefits

The additional sub-areas (shown in Table 5 below) were identified by over 55% of Forces as areas where they were 'likely', or 'very likely', to realise the benefit. These results were surprising as earlier work had identified these three issues as being of paramount importance to officers responding to incidents.

Response Areas (Additional Sub-Areas)	Percentage Likely or Very Likely to Realise Response Benefits	Total Number of Respondents
Greater safety for officers	63% (25 Forces)	n=40
Better teamwork	60% (24 Forces)	n=40
Improved control of situations	58% (23 Forces)	n=40

Table 5: Forces Likely to Realise Response Benefits - Additional Sub-Areas

Theme 6: Working Life

The sixth theme was that of working life. Mobile technology as a tool has been described both as having the potential to improve the working life of individuals and as having a potential to degrade it by, for example, blurring worklife boundaries. In this area only three sub-areas were identified by over 65% of respondents as being areas where they were 'likely' or 'very likely' to realise benefits. These were:

Working Life Areas	Percentage Likely or Very Likely to Realise Benefits to Working Life	Total Number of Respondents
Public perception of officer 'professionalism'	85% (34 Forces)	n=40
Increased officer confidence	83% (33 Forces)	n=40
Greater autonomy for individuals	75% (30 Forces)	n=40

Table 6: Forces Likely to Realise Benefits to Working Life

The following sub-areas were identified by over 50% of Forces as ones where they were 'likely', or 'very likely', to realise benefit:

Working Life Areas (Additional Sub-Areas)	Percentage Likely or Very Likely to Realise Benefits to Working Life	Total Number of Respondents
Increased job satisfaction	58% (23 Forces)	n=40
Reduced levels of data input outside core working hours	55% (22 Forces)	n=40
Better balance of work and 'ordinary life' for officers	51% (20 Forces)	n=39

Table 7: Forces Likely to Realise Benefits to Working Life - Additional Sub-Areas

Theme 7: Force Strategy

The final theme identified was that of Force strategy. While the other themes focused on improvements to business process, or work activity, this theme areas focus on the contribution of mobile technology to the wider Force strategy. The sub-areas have often been used to justify the deployment of mobile technology, however, they are often difficult to measure as multiple technologies and changes to work activity will contribute to any one strategic objective.

In this area over 80% of Forces indicated that they were 'likely' or 'very likely' to realise the following benefits:

Force Strategy Areas	Percentage Likely or Very Likely to Realise Benefits to Force Strategy	Total Number of Respondents
Visibility of officers	100% (41 Forces)	n=41
Enables digitisation strategy (e.g. from paper to electronic records)	93% (38 Forces)	n=41
Part of a wider change to working practices	90% (37 Forces)	n=41
Enables agile working	90% (36 Forces)	n=40
Improved relationship with the public	83% (34 Forces)	n=41

Table 8: Forces Likely to Realise Benefits to Force Strategy

The one sub-area in which less than 65% of Forces felt they were 'likely' or 'very likely' to realise the benefit was conversion of existing systems to the Emergency Service Network (ESN) (58%, or 21 out of 36 Forces). Given the significance of ESN to UK policing this result points to an area of potential concern.

Measurement of Benefits

The measurement of benefits has been a thorny issue for many Forces. Indeed, only 31 Forces indicated that they were actively measuring the influence of the technology on performance, or that formal monitoring and evaluation processes had been used to measure the benefits.

One respondent noted that measurement of benefits could be politically problematic because the project sponsor may not recognise that benefit areas could only be relevant for a short duration (as they are rapidly achieved) or that initial gains in particular areas could be rapid but long-term gains may be much more difficult to realise. Equally, as technology and the Force processes change, benefit areas may become less relevant which, again were difficult to explain to project sponsors: *"… so we got to the point where it was said 'you haven't made this notional benefit', but that was because the world changed around us…"*

In another Force, the Director of the IT service noted that realisation of a metric for which he was responsible was dependent upon achieving difficult organisational transformation led by his Chief Officer Team:

> *"The issue there is with any project that is completed, some of the outputs of the project may mean that it changes the way in which some of the team's work. What I mean by that is that the worst case it may result in redundancies, or it will certainly result in changing people's work, moving demand around, changing job role profiles, so we're getting into the HR world, the employment law world. …I'm about to go back to the Chief Officer team and say, 'we're moving forward quickly, we need to think about the transformation, and keeping all the relevant internal partners fully on board and communicated with'."*

Tightly specifying ambitious targets would be seen as risky unless the Director of the IT Service was convinced that his Chief Officer Team would be able and willing to drive the associated organisational change.

Other Forces noted that they had targeted specific areas of benefit. One respondent stated *"….we have done in narrow areas, probably the best example for us is within crime recording… we monitor that on a daily/ monthly basis to sort of set about how far we're getting towards the 100% mark of mobile submission."*

Equally, a number of Forces indicated that measurement had moved away quantitative measurement to qualitative work to understand the influence of the technology on wider work practices. One respondent noted that *"…benefits have been moving more away from costs towards what does it enable you to use it to do, which is a more subjective intangible area which is harder to cost out and understand what the benefit is."*

Cost and Efficiency

A key motivating factor mentioned by respondents was that of the need to become more efficient and cut costs in light of austerity. However, only 23 indicated that they were actively measuring the influence of the technology in five of the areas related to efficiency, cost and quantifiable financial benefits.

Cost and Efficiency Areas	Percentage Stating They Undertake The Following Metrics And Measures	Total Number of Respondents
Cash releasing	66% (21 Forces)	n=32
Capital expenditure reduction	59% (19 Forces)	n=32
Reduction in operating costs	63% (20 Forces)	n=32
Measuring cost per transaction	47% (15 Forces)	n=32
Officer productivity	72% (23 Forces)	n=32

Table 9: Monitoring and Evaluation Process to Measure Benefits – Cost and Efficiency

It was telling that while increased productivity was identified as a key benefit area (98% or 39 Forces), only 72% of respondents (23 Forces out of 32) indicated that they were measuring it.

Systems Use and Officer Behaviour

A number of the metrics identified could be measured by drawing data from devices about officer behaviour. We see these as primary areas for influence because they relate to the work activity of officers. A total of 78% (31 Forces out of 40) indicated that they were drawing data from devices to understand officer behaviour, the remaining 23% (9 Forces out of 40) indicated that they were not. In our survey, we focused on geographical location of officers as a key metric of behaviour which can be combined with other data types to inform a range of measures. Two of the established forms to understand location are APLS (automatic person location systems) and AVLS (automatic vehicle location systems). From this, 81% (25 Forces out of 31) indicated that they used APLS to understand officer behaviour and 61% (19 Forces out of 31) indicated that they used AVLS. A further 19% (6 Forces out of 31) indicated that they used alternative approaches including integrating geolocation data with data on what applications or systems officers used, and usage time. One Force indicated that they used data from devices for deployment purposes rather than management information.

The following four areas, (illustrated in Table 10) where data which could be automatically drawn from systems, were identified as being used by Forces.

Systems Use and Officer Behaviour Areas	Percentage Stating They Undertake The Following Metrics And Measures	Total Number of Respondents
Use of new services	94% (30 Forces)	n=32
Time out of station	88% (28 Forces)	n=32
Usage volumes for existing digital services	81% (26 Forces)	n=32
Completion rate for mobile services	47% (15 Forces)	n=32

Table 10: Monitoring and Evaluation Process to Measure Benefits – Systems Use and Officer Behaviour

It is particularly interesting that, while 100% (41) identified visibility of offices as a benefit area related to the theme of strategy, only 88% (28 Forces out of 32) indicated that they were measuring time out of station.

Wider Areas of Impact

We also asked about wider areas of impact in terms of measurement of secondary areas of benefit. We refer to these areas as secondary not because we perceive them as less significant but because they relate to other activities or processes which are influenced by, but are outside of, the mobile data users primary work activity. Thus, if the use of a mobile device allows community officers to provide Force analysts or partner agencies higher quality information the key benefit may be for these partners and the Force rather than directly for the community officer. Indeed, in this example, cost per transaction for officers collecting the data using a mobile device may increase and productivity may dip for the officers gathering the data as the process takes them more time to input data into the device. The impact on the primary activity could be negative one, however, offset by a positive impact on the secondary activity. If, therefore, only primary measures are used the analysis may be distorted.

Less than half of the Forces indicated that they were measuring the influence of mobile technology on secondary areas. These included:

Wider Areas of Impact	Percentage Likely or Very Likely to Realise Wider Areas of Impact	Total Number of Respondents
Impact on related Forces processes	68% (19 Forces)	n=28
Impact on other criminal justice partners	64% (18 Forces)	n=28
Existing Force Key Performance Indicators	79% (22 Forces)	n=28

Table 11: Monitoring and Evaluation Process to Measure Benefits – Wider Areas of Impact

Satisfaction Measures

The concept of satisfaction as a monitoring and evaluation tool is one which has become embedded in various aspects of policing. For the purpose of this study, 'public satisfaction' can be considered as the level of satisfaction citizens perceive with their experience of services offered and received, whilst 'user satisfaction' refers more to an assessment of staff perceptions of mobile technology usage in practice. Technology, as seen from a user perspective, can be considered as a factor which influences adoption, use, and word of mouth recommendation to others. Taken together, the use of mobile technology strives to be a factor in supporting the police in their day to day work, enabling greater efficiencies and a higher quality of service, which in turn should lead to improvements in public satisfaction through improved service delivery.

When asked about the formal monitoring and evaluation processes which are used to measure benefits of technology, interviewees said that 58% of Forces used public satisfaction measures whilst 65% of Forces applied user satisfaction measures (Table 12 below).

Satisfaction Measures	Percentage Likely or Very Likely to Realise Benefits to Public or User Satisfaction	Total Number of Respondents
Public satisfaction	58% (25 Forces)	n=32
User satisfaction	65% (28 Forces)	n=32

Table 12: Monitoring and Evaluation Process to Measure Benefits – Satisfaction Measures

Unexpected and Unrealised Benefits

21 Forces indicated that they had identified expected benefit areas, however, been unable to realise the benefits. The reasons for this will be discussed in the next report on benefits realisation. Forces also indicated that they had identified and realised benefits which weren't expected in their original business case. For some Forces, these unexpected benefit areas were seen as particularly significant. One respondent noted:

> *"Yes, the new ways of working, cultural change, the autonomy. I am paid and empowered to do a job and I'm judged on delivery rather than I used to be judged on attendance, if that makes sense. I can deliver just as well, a lot of the time, through being sat in my dining room and in other ways I have to be at work but it enables more flexibility that gives a better work/life balance and does encourage increased proactivity."*

Numerous examples were cited by the respondents reflecting the fact that as officers use and deploy technology they will uncover and invent new ways of using the technology. The challenge for Forces is to both capture and cascade beneficial new ways of working across the Force while controlling less beneficial or problematic approaches.

Other Ways of Capturing Benefits

Almost all of the Forces surveyed had used non-quantitative ways of capturing benefits and for some this was seen as a primary way of capturing the benefits of the technology. Mechanisms include capturing feedback on-line directly from users and then cascading this to officers and the technical team. Respondents also mentioned the use of forums and blogs. One respondent noted that in his Force this occurred mostly by 'word of mouth', however, they also used other methods:

"We have a Tip of the Day from best practice and we'll put on some screen shots to tell a story and send it out to all the users saying, have you tried doing this".

A number of Forces pointed to the pivotal role users who were given a support role played. These were described variously as super users, business ambassadors or digital coaches and were seen as playing a key role in both gathering improving practice and sharing it across the organisation. In some Forces, formal mechanisms have been put in place both to communicate these new benefit areas across the Force and feed them into the business case. One respondent described this process as follows:

> *"We also have a regular communication plan, so an officer who can do something today that they couldn't do yesterday, we turn that into a little piece and put that out trying to encourage others, and then there is the formal PBB process where we formalised methods change, saying 'last year we used to do it like this and now we do it like this, this is the resulting benefit."*

Other mechanisms included the collection of data by continuous improvement teams, staff surveys and the use of researchers based in universities.

Benchmarking and Comparative Analysis

Forces were asked, *"Have any formal monitoring and evaluation processes been used to measure benefits?".* In response to this, 31 Forces stated they had. In this group of 31, respondents were asked which types of benchmarking and comparative analysis they were undertaking. 26 Forces (84%) stated they measured the performance of the existing service to provide baseline, 19 Forces (61%) stated they benchmarked against processes in other police services, whilst 9 Forces (29%) stated they benchmarked against mobile processes in other organisations. This is illustrated in Table 13 below.

Benchmarking and Comparative Analysis	Percentage Likely or Very Likely to Realise Benefits to Benchmarking and Comparative Analysis	Total Number of Respondents
Performance of the existing service to provide baseline	84% (26 Forces)	n=31
Benchmarking against processes in other police services	61% (19 Forces)	n=31
Benchmarking against mobile processes in other organisations	29% (9 Forces)	n=31

Table 13: Monitoring and Evaluation Process to Measure Benefits – Benchmarking and Comparative Analysis

Conclusions

This study has sought to obtain the views on mobile technology benefits identification and measurement of all UK terrestrial Police Forces by investigating a total of 68 different metrics through semi-structured telephone interviews undertaken with representatives of all the UK terrestrial Police Forces (with the exception of PSNI). The key finding from this study was the identification framework to understand how mobile technology influences organisational performance. The 7 measurement themes included:

1. Cost reduction
2. Data quality into systems
3. Managerial control
4. Co-ordination and communication
5. Working life
6. Response
7. Force strategy

The results from the 2017 data indicated congruence between the areas modelled and the expectation of Forces. Therefore, taken together, the measurement and benefit themes offer a conceptual model for understanding mobile technology in contemporary policing environments.

Of the areas where Forces felt they were 'less likely' to realise benefits, one which stood out was the relatively low number of Forces stating they felt they were 'likely' or 'very likely' to realise the benefit of the conversion of existing systems to the Emergency Service Network (ESN) (58%, or 21 out of 36 Forces). Given the significance of ESN to UK policing this result points to an area of potential concern.

A final area worthy of note is the 41% difference between technology enabling a reduction in support staff (70%, 28 Forces) compared to technology enabling a reduction in warranted police officers (29%, 12 Forces). This suggests there could be a significant change in the approach to how policing is delivered and supported in future.

Overall, it is hoped the research findings identified in this study will help inform the future of benefits identification and measurement in mobile technology deployment; influencing both strategic and operational levels within Forces, and the wider policy arenas in which Forces operate.

References

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Appendix 1: List of Forces Consulted in This Research

1. Avon and Somerset Constabulary
2. Bedfordshire Police
3. Cambridgeshire Constabulary
4. Cheshire Constabulary
5. City of London Police
6. Cleveland Police
7. Cumbria Constabulary
8. Derbyshire Constabulary
9. Devon & Cornwall Police
10. Dorset Police
11. Durham Constabulary
12. Dyfed-Powys Police
13. Essex Police
14. Gloucestershire Constabulary
15. Greater Manchester Police
16. Gwent Police
17. Hampshire Constabulary
18. Hertfordshire Constabulary
19. Humberside Police
20. Kent Police
21. Lancashire Constabulary
22. Leicestershire Police
23. Lincolnshire Police
24. Merseyside Police
25. Metropolitan Police
26. Norfolk Constabulary
27. North Wales Police
28. North Yorkshire Police
29. Northamptonshire Police
30. Northumbria Police
31. Nottinghamshire Police
32. South Wales Police
33. South Yorkshire Police
34. Staffordshire Police
35. Suffolk Constabulary
36. Surrey Police
37. Sussex Police
38. Thames Valley Police
39. Warwickshire Police
40. West Mercia Police
41. West Midlands Police
42. West Yorkshire Police
43. Wiltshire Police
44. Police Scotland

Note: PSNI was not included in the study.