

Maximising Public Benefits from Automated Alarms

A report for the NSI

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Section 1. Executive Summary

The focus of this study is on understanding the implications of “Automation” i.e. the automatic digital transmission of confirmed alarms from ARCs to police control rooms, instead of the existing means of ARCs contacting the police by phone (the “Manual System”). The project for implementing the automated alarm call handling process is known as Electronic Call Handling Operation (ECHO) and this is a specific initiative to respond to the police call for alarm response to be automated by 2020. The overall aim is to ease the pressure on the emergency services and alarm receiving centres (ARCs) by reducing their call handling times and reducing the number of errors that can occur from manual response handling. Ultimately an improved response is intended to benefit the public. Within the ECHO project, pilots with a number of police forces are already underway, and those involved in the process along with other experts and stakeholders were consulted to inform the research.

Overall automation and ECHO are viewed positively by those closest to it, but others lacked enthusiasm and raised a number of concerns. Below the key findings are organised in terms of how they may inform the business case for automation/ECHO; challenges to be overcome; considerations for a strategy for automation; and issues raised that are relevant to developing a funding model. It should be noted that these are not intended to be exhaustive (there will of course be other considerations for the work on automation) – what follows is purely those that were identified as being key and were specifically raised during the research.

The Business Case

The research raised a number of points that may be informative for a business case for progressing the roll out of ECHO:

- Police and alarm experts believed that the manual alarm signalling system from ARCs to police forces is slow, cumbersome and generates mistakes. They noted that it can be administratively burdensome with some data being required to be entered twice; with messages being misinterpreted.
- Some police respondents noted that ARCs underestimate how busy it can be for police at times – even on priority lines - and sometimes fail to understand the demands placed on policing.
- Some police representatives and alarm experts suggested that automated alarm signalling has led to cost savings by, for example, reducing the time it takes to manage a call and in generating a speedier police response.
- Early experimentation in automating alarming signalling from ARCs suggests it may be more efficient and accurate (some administrative inaccuracies can be picked up as they occur); and may lead to improved response times.

- ARC representatives felt that checking URNs, which is currently time consuming, could be much quicker under automation.
- Another benefit of ECHO may be in contributing to a raising of standards in the alarms response sector by undermining non compliant companies, but that was noted to be dependent on the police acting on the data it will have available.
- ARC representatives when asked about which stakeholders might benefit most by automation felt the benefits to police would be the highest and to end users would be the lowest.

Challenges to be addressed

A number of challenges were evident that need to be addressed to raise support for automation and ensure the system designed is suitable:

- Most of those consulted that were working in ARCs agree automation will be quicker. While they accepted that human communications can lead to errors many are not currently persuaded automation will be better.
- Some ARC representatives were positive about aspects of the manual system not least in that it provided for dynamic interaction between the ARC call handler and the police control room, including the opportunity to update information (such as incorrect details about the client).
- **There needs to be effective engagement between ARCs and the police:** There was concern that automation may eliminate human contact between the two and with it the advantages that result. Even now ARCs lament the fact they are often blind as to whether an alarm incident was genuine or false. They felt that if they were given the proper insight they could take a lead in working with relevant parties to improve performance. The police too felt that there were messages they needed to communicate (and this may be important during and after automation too). The move to automation needs to take account of the importance of the link between the two; a human connection may still be an advantage and if so it should be facilitated.
- One of the major challenges to automation is providing for a technical connection to a mixed array of police networks.
- Even where police forces consider automation important they need to engage their own IT departments. This can be a challenge due to lack of funding and competing priorities.
- Those closest to ECHO are supportive of it but it may be too early to judge; certainly its effectiveness needs to be monitored as not everyone is convinced by all its purported benefits. For example, those working in ARCs emphasised the importance of accurate data and there was a belief that getting the data up to a required level may require a time investment.
- Indeed, many of the benefits of ECHO are still to be exhaustively tested – which is why some stakeholders are still to be persuaded. Alongside this there is a need for a concerted effort to raise more awareness about the benefits and how potential downsides can be managed.

- Interviewees generally felt video verification would help the police in a variety of ways, but practical difficulties would need to be managed (e.g. increased time needed to assess videos, not least when images were poor).
- ARC representatives who had heard about ECHO were positive but many had not heard of it. The 2020 timetable was generally viewed as ambitious.

Strategy for alarm automation

A number of considerations were evident that may help inform a strategy for alarm automation:

- **There is a need to raise awareness of ECHO:** There is lack of knowledge amongst ARCs as to how automation would work. This is a major gap that needs to be addressed. Insights across the sector on all issues relating to automation generally and ECHO specifically are sketchy. It includes for example, whether the human element could override the system if needed; what if anything was lost by eliminating the human input; whether and how it improved the police response; how data inaccuracies would be handled. There is a need for more awareness raising on a large scale.
- **An implementation plan with a timetable for ECHO needs to be developed and publicised:** While there was general support for ECHO, it was suggested that an implementation plan was needed which included a timetable and took the opportunity to ensure that a phased approach enabled lessons to be learned at each stage and responses developed.
- **There needs to be an assessment of police capability to manage automation:** There is much to commend the adoption of one suggestion that an assessment be conducted to ascertain the capability and capacity of individual police forces to implementing an automated alarm signalling system. The hurdles need to be identified and then managed.
- **Clarity is needed on the potential to connect all police forces:** Alarm automation is perceived to be undermined by the difficulty of connecting to the police networks. Awareness of this is sketchy. The proposed solution needs to be tested and highlighted as this is undermining confidence in automation in some cases. The process and timetable for meeting this challenge needs to be developed and publicised.
- **There needs to be more awareness of the potential of automation – alongside other technologies - to help the police:** There was interest in the potential for the police to incorporate other data in determining whether and how they will respond, such as CCTV images. While this may have great potential there are practical issues to be considered. Examples such as CCTV need to be properly trialled and the findings fed back to the sector. If for example this was deemed beneficial it may help generate a positive change in attitudes towards automation.

- **More awareness is needed on the opportunities for automation of other types of alarms:** This report focused on intruder alarms. Some interviewees noted largely similar potential benefits in automating the process for other types of alarms such as those from lone workers. This needs to be explored and any benefits fed back to the sector.

Funding Model

Considerations pertinent to developing a funding model included:

- There is a lack of clarity among stakeholders about what the costs of automation are and for whom, and how revenue to meet them could be raised. Stakeholders were unsure for example whether less staff will be needed by ARCs, and how much connecting to police networks will cost. This is undermining enthusiasm for automation.
- ARC representatives were divided on whether automation would reduce costs, both for ARCs and the police, and it was unclear whether end-users and installers could benefit (from reduced costs) in any way.
- There is perceived to be a lack of police funding to update current systems and a concern that for some (smaller) forces the investment cannot be justified by the (low) overall number of alarm activations.
- **There needs to be more clarity on costs, what they are and where they will fall:** Various suggestions are being discussed including passing any costs on to installers/end users. Until this is resolved enthusiasm for automation is likely to be muted.

Ultimately to effectively progress alarm automation, much more awareness raising is needed across relevant stakeholders, providing clearer messages on how an effective system will be implemented and the benefits this will bring.

Section 2. Preface

- 2.1 There is a lack of research on the alarms sector. This project was initiated by the NSI to fill a gap in understanding on a crucial stage of alarm response management, the move to automation. While for a while there have been concerns about administrative burdens – for example by overlaps in the process for issuing URNs and the Certificate of Compliance which are not exploited – but the move to automation potentially offers so much more.
- 2.2 This project, (full details on the approach can be found in Appendix 3: Methodology) incorporating a review of existing literature, a survey to elicit basic insights and supplemented by interviews to tease out details, has highlighted the opportunities and concerns of different stakeholders to automation. Specifically it discusses perspectives on the Electronic Call Handling Operation (ECHO) which is a specific initiative to respond to the police call for alarm response to be automated by 2020.
- 2.3 The findings revealed that beyond those involved in ECHO awareness of automation is low. Those closest to ECHO are positive. But the main observation that evolves is that more work needs to be done to help stakeholders understand what the benefits are and how any potential drawbacks are to be managed.

Section 3. Reviewing Previous Research

- 3.1 This section provides a context for the research by considering how alarms operate, the police response to alarms, NPCC guidelines on the police response, the role of Alarm Receiving Centres (ARCs), what automation is and the potential benefits and limitations, and finally relevant future developments in the security and alarm industries.

Alarm functionality

- 3.2 The function of an alarm in a detection system is “to indicate that an anomalous signal has been detected” (Smith and Brooks, 2013: 169) and that a response is required to investigate this. That response might be to shut the alarm down, if a false alarm is discovered, or for the incident to be referred for further investigation by keyholders or the police.
- 3.3 Three basic elements make up an alarm system, typically detection devices; control equipment; and signalling equipment. Detection devices identify an intruder, or intrusion attempts via a sensor through recognising changes in motions, sound, vibration or other disturbances, in areas where these are not expected. Detection devices may also include hold-up alarms, which are activated discretely by a person requesting emergency assistance.
- 3.4 Initially, this intrusion alert is received by the ‘panel’, or control equipment which acts as the main ‘nerve centre’ of the system. Often the signalling equipment is incorporated into this panel, however, the purpose of this is to transmit a signal that an alarm has been activated. This may be locally via a bell, siren or light, or remotely to an alarm monitoring/receiving centre (Risc Authority, 2009).
- 3.5 The National Security Inspectorate (NSI) estimates that of the total new installations undertaken by their approved suppliers each year, only 50% of these are connected to the police, with the remaining systems referred to other keyholders. This is in addition to those who install non-approved alarms, that is they are not approved by a certification body (like the NSI) in their buildings.
- 3.6 The main types of alarm systems are:
- Intruder Alarms (IA) – for the home and business
 - Hold up Alarms (HUA)
 - Combined IA and HUA
 - CCTV
 - Vehicle Tracking

- Cat 5 Tracker
 - Lone Worker
- 3.7 As the security market developed, especially during the 1980s and 1990s, the industry was plagued with an image of one that produced numerous 'false alarms'. This not only led to unnecessary police response, wasting both time and resources, but also damage to the marketability of alarm systems as a product (Cahalane, 2004; Gill and Hemming, 2003). This resulted in 'alarm fatigue' where people – including the police - become desensitised to hearing alarms, and that, along with other external and environmental factors (Smith and Brooks, 2013) led to security decay (Underwood, 1989 McClure, 1997), and a general apathy towards compliance with security procedures.

Police Response to alarms

- 3.8 In 1990, in order to prioritise resources, the Association of Chief Police Officers (ACPO) focussed on the response to intruder alarms. Individual police forces published lists of those alarm installers who had signed an undertaking to comply with this policy and adhere to certain national standards and codes of practice. This was the first time the concept of 'filtering' alarm notifications at alarm receiving centres (ARCs) was introduced. In identifying those caused by 'user error' it aimed to reduce the number of false alarms reported to the police (Cahalane, 2004).
- 3.9 To some extent this was successful, however, in 1995 ACPO amended its policy. This involved introducing the idea that alarm systems need to have 'confirmed alarm' activations for a police response. Confirmed alarm systems have additional equipment that create a 'confirmed' event either sequentially, audibly or visually, so that police are only contacted in the event of genuine security breaches (Cahalane, 2004).
- 3.10 The start of the new Century witnessed more significant revisions in the police approach. Three significant changes were made. First, the police required that security system inspectorates be accredited by UKAS; second, an administration charge was introduced for obtaining a police 'unique reference number' (URN) and this was required before police committed to attend a security-related event; and finally, those applying for the restoration of police response had to provide additional equipment and technology to their systems to generate 'confirmed' alarm activations (Drury, 2000). Other more minor changes to the policy were issued by ACPO before it was dissolved in 2015 and the National Police Chiefs Council (NPCC) was created.

NPCC Guidelines on response to Security Systems

- 3.11 There are currently 43 police forces in the UK with variations in approach to responding to alarms. However, the current NPCC guidelines detail the requirements for a police response to electronic security systems, identified in the NPCC 'Requirements for Security System Services'. It states that systems must comply with the policy and a recognised standard or code of practice controlling manufacture, installation, maintenance and operation (NPCC, 2015 para 1.2).
- 3.12 To apply for a Unique Reference Number (URN) the alarm installer and alarm receiving centre (ARC) (which is usually chosen by the installer), must be regulated by one of the police recognised alarm inspectorates. This is usually either the National Security Inspectorate (NSI) or the Security Systems and Alarms Inspection Board (SSAIB).¹ Their certification confirms compliance with the relevant British and European standards and that systems have been designed, installed and maintained by suitably trained, competent and trustworthy individuals. An administrative fee, as approved by the NPCC, is charged for each URN.
- 3.13 The administration of URNs is slightly different with each police force and different forces appear to ask for different supporting documentation. However, the procedures are broadly as outlined in Figure 1.

Figure 1: Police Administration of URNs

- Application from the alarm installer is received on Appendices F and G either by email or post.
- The application is manually checked to ensure that the installer making the application is currently listed on the relevant police force Compliant Installer List, therefore entitled to make the application.
- The location of the protected premises is checked to ensure it is in the relevant police district, if it is not, the application is rejected.
- Checks are made to see if there is an existing system with a unique reference number registered at the protected premises and registered to the installer making the application or other. Where there is, enquiries are made to determine the status.
- The data is entered onto the Command and Control system and unique reference number(s) are automatically allocated. Where an application includes both intruder and hold-up equipment, a unique reference number will be issued for each element.
- Letters for both the installer and the subscriber are produced from the Command and Control database, to advise of the unique reference

¹ The two independent bodies who carry out inspection services for the security industry are the National Security Inspectorate (NSI) (<http://www.nsi.org.uk>) and Security Systems and Alarms Inspection Board (SSAIB) (<https://www.ssaib.org>). Both are not-for-profit bodies and are Security Industry Authority (SIA) approved certification bodies (for its Approved Contractors Scheme), that operate within the UK. They are accredited by the United Kingdom Accreditation Service (UKAS), the only accreditation service recognised by the Government.

number(s). A receipt is also produced via the database.

- The task to process all correct/valid applications and issue unique reference numbers should take 1-2 days.
- Thereafter the performance of systems that have been allocated a unique reference number are checked daily.
- Where false call levels exceed those set down in the Policy sanction letters (warning/withdrawal/deleted) are issued to both the installer and subscriber, as and when required.
- The unique reference numbers registered to each company are then subject to an audit process (usually every 18-24 months) to ensure installers have notified any changes or removals.

- 3.14 However, there are delays in the issue of URNs by some police forces and the current NPCC Policy does not state how long this should take. Working with systems which are antiquated and administratively intensive (all manual) also means lots of paperwork, fax and email information is involved in the process. Moreover, people often pay by cheque rather than electronically. While the NPCC policy specifies the approach to URNs, it is not practised consistently.
- 3.15 Once the alarm system is up and running, it is the installer's responsibility to provide the monitoring centre with details about the URN. If any of the original details change the installer is required to notify the police within 28 days (as per Para 2.7.1 of the NPCC Policy). However, in practice this often does not happen. The installer/client has two weeks to respond. Then the police will either issue a new URN or use the old one (this varies between forces). The large Metropolitan Police is unable to identify previous URNs on properties, it therefore always issues a new one. This sometimes speeds up the process.
- 3.16 The police classify alarms as two types – Type 'A' and Type 'B'. A Type 'A' alarm needs to conform to British Standard BS EN 50131 series or BS 4737 series and be installed by a company on the approved list. It needs to be monitored by an approved ARC, usually conforming to BS 5979: 2007 Category II. For Type 'A' alarms there are two levels of police response. Level 1 afford immediate/urgent response, depending on the demand on police resource and other priorities. Level 2 response will not be attended by the police, unless an offence is witnessed, leaving ARCs to inform registered keyholders. For Type 'B' alarms systems (such as portable HUA or CCTV systems) that do not conform to Type 'A' requirements, the police technically have no obligation to attend. Where these systems are monitored by an ARC, it will be able to inform keyholders on the incidence of alarm activation who might in turn arrange its own response say from a private security company.
- 3.17 In addition, the police will only attend 'confirmed activations'. These are usually verified, as noted above, by sequential confirmation, as such they are more reliable than just audio or visual confirmation. Sequential

confirmation occurs when the ARC receives two separate alarm activations, within a specified time, usually 30 minutes. This means that the incidence of call out to false alarms is minimised. If false alarms continue, specifically three false alarms from intruder devices, or two from a HUA in a twelve-month rolling period, police response will be withdrawn. This may be reinstated if remedial action is taken to rectify the issue, or where the system has been free of false alarms for a three-month period (NPCC, 2016 Appendix K).

Alarm Receiving Centres (ARCs)

3.18 ARCs provide monitoring for intruder, fire and other types of alarms on a 24/7 basis. In simple terms, they work by receiving activation signals from the alarm devices, which are then filtered for false alarms, so that only genuine intrusions or fires are escalated to the relevant emergency service. There are currently approximately 120 ARCs in the UK.

3.19 To be approved by one of the certification bodies, ARCs must comply with:

- Certification body approval criteria
- Technical Standards (BS 5979 and other relevant industry standards)
- Business Standards (covering insurance, premises, finances etc.)
- Codes of Practice (covering industry-specific issues such as customer care)
- Quality Management (complies with ISO 9001 Standard)

3.20 There are different levels of approval and to achieve the highest level of certification, the ARC Gold Scheme, a number of criteria must be met including standards about premises, equipment, staff, finance etc. (for example see the NSI criteria <http://www.nsi.org.uk/wp-content/uploads/2012/10/SF006-1-ARC-Criteria.pdf>).

3.21 The certification bodies also provide accreditation to monitoring schemes in other centres including:

Remote Video Response Centres (RVRC) – centres that monitor CCTV systems and other CCTV systems used in security applications. These systems should be compliant to BS 8418. (The code of practice for the installation and remote monitoring of detector activated CCTV systems).

Security Operation Centres (SOC) - certification is required for control rooms offering after-theft vehicle tracking and immobilisation services in conjunction with police services.

Lone worker – portable devices can be carried by lone workers that can be used to summon assistance if needed. Providers of these services

and monitoring centres need to comply with BS 8484, the Code of Practice for the Provision of Lone Worker Device Services.

Definition of automation

- 3.22 The International Society of Automation (ISA) (see www.isa.org) defines automation as "the creation and application of technology to monitor and control the production and delivery of products and services." It notes that through the adoption of automotive systems, processes and procedures can be performed without human input. This can be achieved via a number, or combination, of means such as mechanical, electrical, hydraulic and computer-aided systems (Noble, 2017).
- 3.23 The ISA suggests that most industries and many services can benefit from automation including manufacturing; transportation; utilities, defence, security, environmental control, energy management, safety and many others. In addition, they point out that automation can impact on all functions in organisations including installation; production; maintenance; design; procurement; marketing; sales; and even management.
- 3.24 Increasingly, security systems have become automated using standardised specifications and protocols to perform common security functions (Witte et al, 2012) and be carried out at a number of levels. Automated alarm systems may consist of single or multiple sensors that have the potential to control a number of different crime prevention (or safety) devices. Unauthorised access or entry may be detected via door or window locks, which will trigger an alarm event. Whereas, other sensors may detect other issues such as water leaks, smoke, carbon dioxide etc and shut off the relevant supplies.
- 3.25 All control centres to some extent have automated systems. However, further automation will also be achieved when the ECHO project is complete, currently cited at 2020. Led by the trade associations (British Security Industry Association (BSIA) and Fire and Security Association (FSA)), this project looks at automating the alarm call handling process, rather than requiring manual checks or verification of a breach in security. Delivering this via a centralised, fully-automated, electronic call handling service, this will aim to ease the pressure on the emergency services and alarm receiving centres (ARCs) by reducing their call handling times and reduce the number of errors that can occur from manual response handling.
- 3.26 The ECHO project will also look to automate the Police URN management system by learning from the current pilots with the Metropolitan, Essex, Somerset and Avon and Northants police forces and a limited number of alarm companies. One of the anticipated benefits of ECHO is expected to be that it speeds up the time for the

police to receive an alarm signal, meaning they can be quicker to respond. This aims to improve the service and also reduce costs.

- 3.27 The initiative is consistent with the national drive to reduce the pressure on command and control units; for police forces to better understand their current demand and capacity; and for ensuring they use their IT systems efficiently (see, HM Inspector of Constabulary, 2017).

Assessing alarm automation

- 3.28 There are a number of benefits and drawbacks to alarm automation (see, Autor, 2015; Brooks et al, forthcoming) which may apply in different contexts. Examples of the benefits include:

- Consistent and continuous delivery, response and stable functions
- Reduces time to respond to device activations
- Decreases labour costs and optimises effort/input
- Increases accuracy and reduces human error
- Undertakes tasks beyond human capacity
- Reduces the number of false alarms through filtering
- Can build priorities into the system
- Ease of maintenance with simple quality checks, many of which can be inbuilt into systems
- Provides a platform for integration with other monitoring systems
- Produces better quality of data – including pictures, CCTV, video capture
- System transparency
- Potential reduction in insurance premiums

- 3.29 That noted, they are not an unqualified good, limitations of alarm automation can include:

- The cost of the initial capital outlay
- Development costs
- Loss of versatility
- Connectivity problems
- Software and other technical glitches
- Not all things can be automated.

In perspective: future developments in the security and alarm industries

- 3.30 Security will most likely change considerably in the next decade. This will in part be due to technological advances, but also due to system integration. Smart homes and premises with BACS (Building Automation and Control Systems (Brooks et al, forthcoming) are becoming embedded into the built environment, but security remains a

challenge. The future will see alarm devices integrating with other home devices, such as those controlling smoke, temperature, light and water.

3.31 Advancements are likely to be seen in a variety of areas, the following are illustrative:

- Further use of wireless technology and use of IPs (Coleman et al, 2017; Medhat et al, 2015; Fu et al, 2017; Terra Daily. 2013). These systems are more portable, flexible and easier to install. They will include 'Alexa-style' voice-command technology.
- Development of mobile and smart phones, including Near Field Communication (NFC) and Apps to control systems (see Das et al, 2011).
- Use of predicting technology, both for sensors (Wu et al, 2012) and learning software. These utilise enhanced algorithms to learn daily routines of households/buildings (see Smith and Brooks, 2013). By monitoring for activity-based anomalies monitoring centres can detect possible threats and take appropriate action (Dahmen et al, 2017).
- Further use of Cloud Technology for data storage and transmission (Maturana et al, 2017; Vorst et al, 2014).
- Further development of sensing technologies (Li & Da Xu, 2017; Morello et al, 2017) and Advance Exterior Sensors (AES) multiple integrated sensor technology such as using thermal infrared imaging, visible light imaging, and microwave radar (Blum et al, 1979).
- Expansion of use for Trigger Technology, which is already used to take pictures or view live feed when motion is detected. This could be expanded to undertake different tasks such as turning on TV to make it sounds like someone is at home; turn lights on, or even play pre-recorded conversations (see <https://www.safewise.com/blog/6-hopes-and-dreams-for-the-future-of-home-security/>).
- Utilisation of High Frequency Security Cameras (recent development of cryogen-free terahertz security cameras operating at EM frequencies below 1 THz) (Kanda et al, 2017; Lukas et al, 2006).
- Use of artificial intelligence (AI) which enables systems to 'learn' to perform tasks and problem-solve like humans (Norris, 2017).

3.32 In short the process of automation is likely to evolve alongside other developments as security respond to needs in varied environments (see, Allen and Loyear, 2018). This is the context for the interpretation of findings, the subject of the next section.

Section 4. Police and Alarm Industry Expert Interviews

- 4.1 This section is based on interviews conducted with 12 representatives – of which 6 represent police forces and 6 are alarm industry experts/representatives. First, consideration is given to issues with the manual system that have prompted a move to automation, before moving on to consider the benefits, challenges and costs of automation, and finally the project to adopt automation (ECHO) is explored.

The manual alarm signalling system

- 4.2 All police and alarm experts we spoke to commented that although the current manual alarm signalling system from ARCs to police forces works, it is slow, cumbersome and causes too many mistakes throughout the process. Therefore, a more automated system would be welcomed, for example:

There is no specific problem, but because it is a manual process it is slower than an electronic system, though still quick compared to some systems. It has worked like this successfully for many years, but it would be good if we can speed things up.

(Interviewee 7)

There are a few key drivers, in the current system the whole process is manual. So, it's antiquated. Also, forces have their own foibles and it is not consistent.

(Interviewee 9)

- 4.3 It was noted that one of the major inefficiencies is that much of the data are input twice during the process, both by ARC and police operators and this information can be recorded differently by each party. As one interviewee pointed out:

Double keying of the same information gives the potential for error, with duplication of effort.

(Interviewee 6)

- 4.4 Automating the alarm signalling process between ARCs and the police, potentially minimises human input and as a consequence reduces errors. Calls can be routed straight through to the police dispatcher cutting out the call handler. Interviewees pointed out:

The main drawback of the manual system is the human element. This is especially true when tasks need to be so

precise and repetitive. I have observed in (another sector) how these things can go wrong.

(Interviewee 11)

By having this [automation] it takes the link out of the chain and the call goes straight to where it needs to be. Once we have the hub that will be even better. For example, where incidents are on the border, it will help to knit the police forces together.

(Interviewee 4)

- 4.5 However, one person pointed out that the human element in a manual system can be both a downfall and a benefit:

The main benefit (as well as being the main downfall) is once again the human element in the process. When a human intervenes in the correct way this can be the best. Even the best programme can go wrong, or unforeseen events can happen which can be dealt with by a human presence.

(Interviewee 11)

- 4.6 Because so many people are currently involved in the chain of the manual system, this increases the chance of errors at every stage in the process. This can result in an alarm incident being incorrectly recorded, for example wrong details being taken down and police being sent to the wrong address. As one interviewee outlined:

The main problem is it gives room for error from the call handler's perspective – whether that be at the call monitoring centre, by the person giving the wrong URN details, or by the call handler at the police inputting it incorrectly.

(Interviewee 4)

- 4.7 The risk of errors increases when messages are being relayed from one person to another, so cutting down the number of people involved in the process should minimise the mistakes. As one interviewee highlighted the URN is important in deciding what action should be taken if an alarm incident occurs. However, these details can be incorrectly recorded at a number of stages:

Sometimes the URN is written down wrong from the beginning; other times transposed when the installer tells the ARC; other times entered incorrectly by the ARC. The first that might be known about this is when an alarm activation occurs and the police say they won't come out to it because the URN does not match.

(Interviewee 8)

- 4.8 In addition, interviewees outlined that terminology used by different operators can sometimes cause confusion when passing a call over. This often relates to whether an incident is 'confirmed' or unconfirmed,

meaning that sometimes incidents get classified as 'R' status (no visit) when in fact they should have been attended. One alarm expert said:

Information with the manual system is lost in translation. Different operators use different codes and sometimes they get it wrong.

(Interviewee 5)

- 4.9 Some interviewees were critical about the time it takes to get through to the police to generate a response to an alarm signal or even to get a URN allocated in the first place and indeed to get updates from the police. Comments included:

The problem with the current system is that the police do not want to respond to alarms. Issuing URNs is not a priority for them. Alarm Administrators now tend to be part-time and therefore, if you need a URN urgently nothing happens. It's becoming more and more difficult.

(Interviewee 5)

In terms of getting a URN, some police forces are very capable, helpful and easy to work with, but there are others that aren't. We are less than a mile from our local force, so we usually go in to see them and they are excellent. Whereas dealing with other forces is a nightmare ... One of the drawbacks of the current manual system is when we takeover a system we need to know the false alarm history but recently one police force took eight months to reply.

(Interviewee 12)

- 4.10 However, a number of police representatives raised the issue that ARCs do not always recognise legitimate delays in getting through to a police operator. Alarms calls may enter through on a priority line, but even these can be busy at times causing a delay. ARCs have been known to hang up and redial, not realising that this puts them back at the beginning of the queue again. In addition, some have called 999 instead. A couple of interviewees commented:

They don't realise how busy the control room is, or the priority of their call.

(Interviewee 4)

Police control room lines are busy – even on priority lines.

(Interviewee 6)

Potential benefits of an automated alarm signalling system

- 4.11 Many potential benefits were provided in support of automating the alarm signalling system to the police and these will be discussed in the following section. Whereas many felt that the manual system has served the industry well to date, it has suffered from adverse publicity (for example in the weak response to the Hatton Garden heist), which

has tarnished its reputation. In addition, some alarm experts felt this was a good time to assess the potential of automating alarm systems, especially given the resource pressures on the police:

Biggest concern for installers is that police will no longer attend any alarms because of conflicting demands on their limited resources. This would put us out of business.

(Interviewee 8)

We are moving to be more technical proof with apps etc. The police, in all honesty, have limited resources and can't possibly handle all the alarms and apps, even if there is visual (or other) evidence. The police have stated that by 2020 they will only respond to particular calls which are validated and verified. This is the real driver behind this.

(Interviewee 11)

4.12 Automation of the alarm signalling system between ARCs (specifically ADT, Banham, Chubb and National Monitoring) and the police, has been trialled by several police forces (Essex, Northants, The Met, Avon and Somerset) over the last few years. This has accounted for between 15-50% of alarm calls being handled electronically in the various forces.

4.13 While the initiative has not been subjected to independent evaluation individuals representing forces and alarm experts commented that with automation, alarming signalling from ARCs was less labour-intensive and hence faster, more efficient and accurate than with the manual system. It had provided more accurate data for the Command and Control systems, which may in turn have led to increased response times by officers attending alarm incidents. It provides a more certain and consistent response. Comments from interviewees about potential automation included:

Oh, it will benefit the industry overall with efficiency, speed and clarity of what's been done. The manual system has many forms and reading handwriting and even typed forms, is a problem. Often get the wrong address or postcode.

(Interviewee 5)

Automation removes the element of human error and decisions by the call handler, who need extensive knowledge to handle it.

(Interviewee 3)

4.14 In addition, they commented that wrong entries might be identified at source, with incorrect data being bounced back when input. This ensures that errors are avoided further down the line, avoiding the police responding to the wrong address for example.

- 4.15 Some police representatives commented that automated alarm signalling had reduced actual call times, in turn leading to cost savings. For example:

Just under half of our work is electronic ... we calculate that we have saved approximately one minute on calls through automation.

(Interviewee 2)

[We have made] efficiency savings, with a quicker response for all people. We estimate that each call and response costs around £200.

(Interviewee 6)

- 4.16 Alarm experts also highlighted the benefits in terms of reducing the time to make calls, reducing response times and making it more efficient all round for those using the system and ultimately the client, for example:

The main benefit of automation is of course efficiency – it is faster and more accurate. If you can prove this and get it working over time you will need to have fewer people involved in the process.

(Interviewee 11)

- 4.17 This has meant that police resources have been freed up to be re-deployed elsewhere where needed. One interviewee said:

From a police perspective the benefit of it is not having the call handler tied up, that is a massive benefit. It can free up a person for other things and handling 999 calls.

(Interviewee 4)

- 4.18 Because the data input into the system is more reliable, checking and monitoring of calls is easier and more accurate, ensuring that the NPCC Policy for alarm response is followed precisely. Interviewees noted:

The other good thing is that now we know what passes through the system. Making it digital makes it all so much easier to check.

(Interviewee 10)

Also, it will be much easier to monitor the three strikes and you are out. Because it is digital you could more easily determine which are the guilty lines and it would then quickly come off the system. This may have some benefits too.

(Interviewee 10)

- 4.19 As well as the short-term benefits of automation, some argued the case for long-term gains too. Potentially one of the most useful will be to add other features to the system, such as the ability to send additional information to the police about an alarm incident. This could include audio, video and CCTV files, which are often available, but have to be

listened/watched by the operator and passed on manually. Police and alarm expert comments relating to this included:

We can send not just alarm messages but also audio and CCTV. So, the operator currently has to listen and watch and then pass on manually, and this (automation) will enable this to be done if the police have the capability to take it.

(Interviewee 9)

Video verification does reduce false alarms. We always provide video evidence as well as sequential alarms. The industry is becoming to rely on CCTV and technology.

(Interviewee 5)

We are improving the quality of data, so it says at the moment that we have an intruder alarm and a break in is taking place and we may be able to pass CCTV and so much else. That will come later but that is the potential.

(Interviewee 9)

- 4.20 One expert further outlined that over time it is hoped that the operator would be in a position to choose the most appropriate verification data to access for the particular alarm breach. He explained:

[T]his is what I call Stage 3 of the project. We need to send a base signal and location, but other things may be useful as well. For example, keyholder data, this is currently held in a separate database. When you get to the position where you have large volumes of information and data (which could carry viruses etc.) you must be selective. I envisage you having a menu where you can choose various verification data (video or audio files, facial recognition). This could flow back down the system as well which it currently doesn't.

(Interviewee 11)

- 4.21 Not that improvements are a given:

I don't think that video, or other verification is going to reduce false alarms. People just don't care. Unfortunately, any advances in technology will only be advantageous if there is a degree of ownership and accountability and I see less of that from the bill payer at the moment.

(Interviewee 12)

- 4.22 Other interviewees pointed out personal alarms, as well as intruder alarms, would benefit from additional information, such as location.

When developed, if we get additions to it that will be good, especially for lone workers (though we don't have many). If we got more information, such as location or a

map that would help us pinpoint the incident better. Any visual aid must be good to enhance it.

(Interviewee 4)

- 4.23 Police resources will also be better utilised, eliminating alarm incidents that they should not attend and ensuring that genuine customers registered with compliant companies will get a police response. Comments relating to this include:

All the key stakeholders would benefit including the police, alarm companies and the public. Providing alarm companies have stayed with the requirements of the policy then they will benefit.

(Interviewee 1)

The end user has more certainty of response. Police do see it as a service people pay for and so there is this awareness they should respond if they believe it to be authentic.

(Interviewee 10)

Challenges of implementing an automated alarm signalling system

- 4.24 Automation of the alarm signalling system does present some challenges. It was posited that not all the relevant stakeholders are at the same stages of readiness for automation.
- 4.25 For the police at least there are likely to be resource limitations that may reflect a lack of priority to establishing the required technology upgrades. As one interviewee noted:

The biggest barrier is getting the police, with their varied systems, to pay for the interface because they have no money. Once we have that approved then it should get better.

(Interviewee 10)

One of the biggest technical changes would be rolling it out to all the 43 forces. At the moment there are different command and control systems operating.

(Interviewee 1)

- 4.26 Of the 43 police forces in England, Wales and Northern Ireland just over half use the STORM Command and Control system by Steria UK. For this system, an optional alarm automation module has been written as an 'add on' and therefore can be purchased by those police forces who operate this particular system. As one interviewee commented:

The technical element is the key thing we need to get around. The police have a mismatch of IT systems. One or two key providers, Storm Steria, is used by command and control used by about half the forces, so connecting to them is not really a problem.

(Interviewee 9)

- 4.27 However, the remaining police forces use a range of other systems including TOXIN, CAD, Microsoft Window-based platforms and even bespoke packages. The challenge therefore will be to ensure compatibility with these and an automated system.
- 4.28 According to some interviewees, the design of the software is less of a problem, but the interface to the police systems is more significant:

The software is not a problem, it is very easy. It could be complicated to connect to the police, but the Home Office are being positive.

(Interviewee 10)

The ECHO Steering group have allegedly spoken to Steria about those forces who are not on STORM and they say that it should not be a major problem for other IT providers to alter the systems to accommodate the ECHO project and go electronic.

(Interviewee 7)

- 4.29 Yet dealing with alarms is not a core activity of many police forces and some smaller forces may not see it as a priority due to the relatively low number of alarm incidents they encounter. Therefore, getting them engaged and willing to allocate resources may be challenging. Several interviewees who were trialling automated systems acknowledged:

For police forces the number of calls is not critical to some therefore don't see the advantage of automating the system and spending the money.

(Interviewee 2)

The biggest challenge to us and why we haven't automated yet, is economies of scale. Other, larger forces have done it, but for us, it just wouldn't pay.

(Interviewee 6)

- 4.30 It is not just the police commitment either, IT departments have many priorities and pressures on them and alarm systems cannot be assured to be a sufficiently high priority. One interviewee shared an early experience of automation:

When we introduced it [automation] we had to involve IT, which was ok, but of course they had other priorities at the time. They have been supportive since.

(Interviewee 2)

- 4.31 For some this may be quite a difficult task, tying up much IT time and resources, as well as scheduling training sessions as appropriate. As one IT specialist from a non-automated police force commented:

IT departments need to know about it and the sheer volume of work it might create to keep on schedule and

ensure they have the software, paperwork, infrastructure, training and resources.

(Interviewee 6)

- 4.32 One way of ensuring that police forces get the relevant IT support and expertise would be for them to share IT services which sometimes happens. As interviewees commented:

There could be issues with small police forces who have less than adequate systems. We could look at joining up if [it is] a massive problem. I know we may have one or two forces like this in our area.

(Interviewee 3)

Other police forces might struggle, it will depend on IT issues and who they deal with. We have IT provided jointly with XXXX constabulary ... maybe we could work together for this. But for small forces that can't and aren't on STORM it could be very difficult to support it.

(Interviewee 4)

- 4.33 Good practice would suggest that an assessment is needed to ascertain the readiness of individual police forces in terms of capability and capacity towards implementing an automated alarm signalling system. As an IT expert interviewee commented:

We need to be pushing for this now to make it happen. Most forces have two to five-year IT plan, therefore, to move forwards we need the NPCC to send a template out to each force.

(Interviewee 6)

- 4.34 In terms of relationships with others, a number of police interviewees mentioned that they were not sure if ARCs were ready for this change to automated systems. They were worried about the cost issue to some, especially the smaller organisations. One commented:

The cost will be the biggest issue for monitoring centres. Where will the money come from? Will small firms disappear or amalgamate with others?

(Interviewee 4)

- 4.35 Of more concern though to the police was the issue of data reliability. Automation is a quicker process provided that all participating parties hold the same data. Although most police forces try to audit and clean data between themselves and ARCs every 12-18 months, interviewees were still concerned about this. As noted above, data mismatches in the past have resulted in people not receiving alarm visits when they were entitled to them and police being dispatched to the wrong address. Therefore, both parties need to verify their data to ensure that they are complete, valid, accurate and consistent. As one interviewee recalled from their own automation experiences:

The big issue we had when we connected with XXXX (ARC) was data-matching. It needed a lot of time and preparation with both the data and the fields to ensure they matched between the two systems.

(Interviewee 4)

- 4.36 One expert however, cautioned about the implementation of automated alarms (including the proposed ECHO system) believing that it needs to be implemented gradually with each stage being successfully tested before moving on to introduce further systems and additions. He commented that:

If you get it right, an automated system can be quick and tireless ... We need to ensure though that the system has been tested for all parameters i.e. when it is not working. We need to introduce automation on an iterative basis and make gradual progress before moving onto the next stage.

(Interviewee 11)

- 4.37 In addition, he pointed out the need for a sound and safe system, including the appropriate backup procedures:

[Y]ou need to have the appropriate failsafe system, for example, more than one server in a different location. The systems can be vulnerable if you try and do it on the cheap.

(Interviewee 11)

Costs for automating the alarm signalling system

- 4.38 As mentioned earlier, there are costs to automating the alarm signalling system both for the police but also ARCs. The network is key but who should pay for this is not finalised:

Automation will have cost implications for ARCs, the police, installers and end users, but I think that the benefits outweighs the costs. It's Hobson's choice really, with insurers demanding more and more in terms of alarm systems. Maybe the expense will be felt more by individuals rather than commercial bodies.

(Interviewee 12)

- 4.39 The current thinking includes the suggestion that the costs could be borne by ARCs or even passed back to the installers and ultimately the end-user clients. As one expert stated:

There is some debate currently whether the cost will be borne by the ARCs or passed onto the end-users. In theory, ARCs will eventually need less staff. We need to sell it to the police ... property.

(Interviewee 11)

- 4.40 If this is the case the current system for collecting monies due will need to be reviewed and allocated to the right organisation. But some think that these costs will be minimal and should not cause undue concern or hardship. For example:

I'm not particularly a commercial animal, but yes, it's £1 per line per year, therefore, not huge individually. It's hardly big stuff ... The extra cost to installers and end users I expect to be very moderate, on the order of a few pounds per premises per year.

(Interviewee 11)

I would predict that ARC costs will in due course, reduce appreciably. Costs to Police ... are unlikely to be directly affected, but they should, hopefully, see a reduction in unwanted signals, reducing the pressure on staff.

(Interviewee 11)

- 4.41 However, and following an observation made above, not everyone looked at things quite so simplistically and felt that some smaller ARCs might find the cost of automating from a manual and telephone system quite expensive.
- 4.42 While there was some uncertainty about costs most felt that automation would be cost effective in the end, for example:

Automation should reduce costs if anything when you get rid of the paper system and associated admin. Even with the software implemented it should have full cost recovery within one year.

(Interviewee 5)

The ECHO project

- 4.43 In essence, ECHO provides a centralised hub; it follows the same principle as MAIT (Multi Agency Incident Transfer) with direct connections from a central hub to all ARCs and police forces. As one interviewee explained:

There will be two hubs (A and B), therefore continuity. You will be able to route calls through either. In theory, any ARC alarm call can be routed to any police force and they can send an acknowledgement back and URN.

(Interviewee 1)

- 4.44 Those closest to the ECHO initiative were certainly supportive of it, for example:

The ECHO System is good – I've been involved with a couple of local police forces to look at reducing their overheads by the use of CCTV.

(Interviewee 5)

4.45 And one who was not close thought that in principle it was a good idea:

I know very little about it, but it sounds an absolute necessity. It will take an old paper process and drag it 'kicking and screaming' into the current world. This process hasn't changed in years and is the last bastion of a paper system.

(Interviewee 12)

4.46 More precisely it was argued that automation will operate faster, reduce human error and generally give a better service to all users, as well as facilitate the opportunity for a wider use of automation:

ECHO will be hugely beneficial and save a lot of time, it will reduce errors as the system will not pass them on. The decisions will be made by the computer, saving resources and reducing false call rates.

(Interviewee 3)

ECHO [c]ould be expanded to include social care and ambulance. That is going beyond where we are now, but we are looking at a wide use of the technology so that things can be added later.

(Interviewee 9)

4.47 Moreover, it has the potential to help raise standards since if the ECHO project is implemented fully it will make it more difficult for non-compliant alarm companies to generate a police response via an automated system:

[We will have the] ability to reject calls that we should not be responding to.

(Interviewee 6)

The major one [benefit] for me, is for those alarm companies who have chosen not to use the compliant route, this will eradicate them. Ultimately, this will ensure that compliant companies will get a response and it will weed out non-compliant ones. The police and alarms companies who are paying and being compliant will benefit from automation, which in turn is good for their business. Non-compliant alarm companies seem to know their way around the system, they know what to say to get a police response. If ARC systems are not up to date this can result in URNs being passed that have expired. If this is for personal attack alarms, for example, the call handler won't take the chance and will activate a police response, wasting police time and resources.

(Interviewee 3)

4.48 Yet the key to ECHO is that it is new. To be truly effective it will need to operate to its full potential. For example, it will require the police to use data it will have available to refuse to respond to some alarm calls, for

example, non compliant companies who report via the emergency call (999) system:

One of the strengths of the system [ECHO] is it will only allow access to certificated companies, therefore, it will be 'more easy' to identify those who are not certified.

(Interviewee 2)

There are some ... maybe a dozen or so non-compliant alarms companies who abuse the 101 and 999 numbers. Once it is fully automated they cannot do this. The police will become more suspicious and ask even further questions so that only registered companies can use the system.

(Interviewee 7)

I think the police will be a lot more bullish about this in the future. If an uncertified ARC rings 999 they will obviously have to answer, but how they prioritise that call, if at all, is another matter. After ECHO they will try and reel this in. But we need to take it in bites.

(Interviewee 11)

- 4.49 But others warned that there was nothing axiomatic about being able to achieve this on the one hand and actually doing so on the other:

Other big threat is the unregulated market who seem to be able to pass alarm activations onto the police and get a response. I am uncertain whether automation of alarm signalling, or the ECHO project will eliminate this.

(Interviewee 8)

- 4.50 As with the automation agenda generally, a pressing issue with regard to ECHO specifically was one of clearly articulating how costs will be met. There was constant reference to this issue throughout the interviews. For example:

It could be a winner for police forces, depending on the level of accuracy in their data. But resources are required – there will be a short-term pain for longer term good.

(Interviewee 6)

ECHO is not police owned, it is not revenue for the police, they get no money, it is a process to assist the police by connecting systems. Now we don't know yet the cost. This is not a police company, so it is industry owned and benefits the industry. Indeed, if ECHO takes away admin of police then we would like to think there was a reduction in the cost of the URN.

(Interviewee 9)

- 4.51 And not all interviewees were convinced cost savings would result, both because there was uncertainty what costs would be incurred in setting up ECHO and then maintaining it, what level of savings there would be and for whom in staffing levels (if any) and how automation

affected work levels certainly for ARCs but police too. Some different views on this issue include:

It's a cost saving thing that everyone will benefit from in the long run. Less resources will be utilised by both the monitoring centres and the police, which in turn will lead to less staff being needed maybe. It's just the initial cash outlay that is the problem.

(Interviewee 4)

The ARCs will certainly benefit from this in terms of resources, not sure if it will mean less staff though, but some less work.

(Interviewee 6)

4.52 It is not that there are not ideas on how costs can be met:

This needs some work though, as to how we ensure we collect the money. It is easier to collect money from say 70 ARCs than 1,500 installers. Also, it is the ARC that passes the call, so it makes sense to charge them at this point.

(Interviewee 10)

The proposal for ECHO project is it is supposed to be self-funded by putting a levy on alarms currently monitored. These are approximately 1.25 million at present, so even a £1 levy on each per year would raise £1.25m in funds, for forces to bid for to upgrade their software.

(Interviewee 1)

4.53 There is one final point here. In making system connections to the police force data security is clearly paramount, and some of those involved feel that assurances here have not been refined. It is not viewed as a problem that can't be solved more by some as one that still need to be.

Summary

4.54 ECHO is new and may well provide a good model. That said these are the early stages of its development and benefits have not yet been worked through, nor for that matter the drawbacks. Progress needs to be tracked carefully to ensure that supporters are fully cognisant of the impacts on all the stakeholders in all their various guises.

4.55 Moreover, ECHO has been initiated to meet an ambitious target and timetable, for all alarm signalling systems to be automated by 2020, but it is far from a given this is achievable as one of those closest to it noted:

This is quite a big initiative ... we can't just do this tomorrow. It stopped a year ago, there was no

momentum ... We also lost one of our drivers ... when he left we lost 18 months' work ... We kept plugging way. We got some funding.

(Interviewee 9)

- 4.56 Indeed, to date progress on automation has been slow; a small number of police forces have been piloting automation for years (and talking about it for much longer). Malaise; costs; the lack of a national solution; technical uncertainty; to some extent the need for assurances about data security; and the need for leadership all contributed and/or are contributing to inertia. The following quotes help to summarise the position:

We originally started automation with XXXX in 2010 after about 3 years of talks. Then we had another 65 more ARCs to connect with, so we thought why not look at a national service. This planted the seed for the ECHO project.

(Interviewee 2)

Although it is successful, in order to roll it out to other ARCs it would cost the police force approximately £50k per connection and there are about 50 more ARCs to capture. Therefore, we decided to wait until there was a national solution with only one or two hubs.

(Interviewee 1)

- 4.57 ECHO has support, but there is still a lack of understanding about what it does and how it can achieve its aims. These points are considered further in the next section – specifically in terms of the views of representatives from ARCs.

Section 5. The ARC perspective

- 5.1 This section is based on 21 responses to a survey issued to Alarm Receiving Centres and 8 follow up interviews conducted with survey respondents and 4 interviews with contacts provided by NSI.
- 5.2 Nine of the survey respondents were from businesses that only received calls and 12 were from those that installed alarms as well as receiving calls. The majority of companies (9) had between 11 and 100 employees, followed by 6 that had between 101 and 1,000. Four companies had more than 1,000 employees but only one had less than 10.
- 5.3 Of those that responded to the question (18), only 2 operated an automated system with any police forces, whilst 16 only used a manual system.
- 5.4 The survey questions asked respondents to indicate their level of agreement with a number of statements on a five-point scale and provide additional statements where appropriate. The figures cited below reflect the responses that indicated 'strongly agree' or 'agree' and 'strongly disagree' or 'disagree'. Neutral responses and 'not sure' responses are not included unless specifically mentioned.
- 5.5 The interview respondents were drawn from a range of backgrounds from directors of companies to control room supervisors. Between them, the ARCs represented covered intruder alarms, lone worker alarms and CCTV. Two ARCs were organisation or business specific e.g. local authority or banking group whilst the others had contracts with a wide range of different organisations or householders. Most of these had a national reach though one was largely focused in the Midlands. Where indicated, the number of sites covered ranged from 500 to 40,000.
- 5.6 The interviews provided more explanation behind the reasoning supporting the views expressed in the survey. In short, there was a general lack of awareness of how such a system would operate and, therefore, how it would impact on their respective services and other stakeholders. Six of the interviewees had sufficient knowledge and/or experience of automation and as a consequence of their deeper understanding were in favour of automation, notwithstanding that there were a number of practicalities that would need to be addressed for it to operate successfully. Indeed, one respondent had attended a meeting with the Metropolitan Police Service on automation since completing the survey and reported that, as a result, his perspective had changed to a more positive one.

Manual system versus automation

- 5.7 The survey and the interviews canvassed the views of the respondents on the likely benefits and potential drawbacks of automating the alarm transmissions from the ARCs to the relevant police force control rooms. To begin with, respondents were asked to assess the speed, efficiency and accuracy of the manual system.
- 5.8 Over half of the survey respondents did not feel the manual system was slow (10 out of 19) and more than three times as many felt it was efficient (13 out of 20) as felt it was inefficient (4 out of 20). Nearly twice as many (11 out of 19) agreed it resulted in accurate information being passed to the police as felt that it did not (6 out of 19).
- 5.9 More disagreed (9 out of 19) than agreed (6 out of 19) that the manual system led to confusion when details were passed to the police; that the manual system caused false alarms (11:5 out of 19); and that it resulted in confirmed alarms being false (11:4 out of 20).
- 5.10 The interviews highlighted some of the reasons for support or criticism of the manual system. The key advantage of the manual system cited was the capacity for dynamic interaction between the ARC call handler and the police control room. This was seen to be a benefit in a number of scenarios: the opportunity to develop good working relationships with the police (mostly applicable to those working with fewer police forces); the ability to check information and correct errors as they go along; the ability to update the police as events unfold and guide them through the sites (particularly if the ARC operator has access to CCTV) and the ability to close down false alarms based on further information e.g. from key holders. A quarter of interviewees also noted that by speaking directly to a police operator, ARC operators had some surety that the alert had been referred on and could close the alert down and move on:

We actively manage alarms - don't just pass on. We look at CCTV, check it's not the cleaner. Can see where alarm has gone off against a schematic so able to give better information to the police. Can speak to police controller about infinite number of scenarios ... At the moment we are confident we are not sending the police off to false alarms - would that continue?

(Interviewee 6)

- 5.11 There was a range of views on whether direct contact between operators increased or reduced the risk of confusion:

The manual system is reliant on people and I generally put more faith in systems, mainly for consistency. The manual system has worked well for years, but recently there have been a couple of high-profile incidents.

(Interviewee 12)

- 5.12 For some, trying to convey information from customers who may not speak English (very well or at all) and dealing with a wide range of regional accents within ARCs and police forces raised the risk of confusion. For others, the ability of humans to sense check data was an asset:

Time is the big disadvantage and the risk of things being misheard or lost in translation.

(Interviewee 2)

If you take the human element out you are removing the intelligent aspect that can quickly sense check information.

(Interviewee 10)

- 5.13 It was universally agreed, however, that getting through to police control rooms could be difficult and that some forces were more accessible than others. This was exacerbated when police forces didn't keep ARCs updated about phone number changes, for example:

Sometimes, if the weather is bad and there are lots of alarms going off, or there is a major incident, we can't through to the police but we don't know why.

(Interviewee 8)

Main disadvantage is the time it takes to contact the police sometimes, especially with the volume of traffic they are dealing within the command and control room. Can take up to 30-40 seconds to pass the call onto a dispatcher and get the CAD reference (or STORM ref as some call it).

(Interviewee 11)

- 5.14 Asked about automated alarms, slightly more survey respondents agreed that automation would be unlikely to be more efficient than manual (9:7 out of 19) although the vast majority who had a view accepted automation was faster (12:2 out of 18). Interestingly while more felt that automation was unlikely to result in more accurate data being passed to the police (10:7 out of 19), nearly all of those who disagreed did so strongly (6/7). Most agree there is no confusion over the details with automation (12:3 out of 18).
- 5.15 When focusing on whether automated alarms speed up the process of police response many survey respondents did not express a view, of those who did more agreed (8:3 out of 19). Three times as many felt automation made monitoring easier (9:3 out of 18), yet while 10 (out of 19) thought automated systems will be unlikely to reduce false alarms, 5 (out of 19) thought they would.
- 5.16 All of the interviewees agreed that an automated system would make the link between the ARC and the police control room faster:

Automation will be faster getting through and no mess up on the police number.

(Interviewee 1)

We have dealt with a couple of forces for several years now and the system ties up less time and is quicker for all including the clients who get a response (if applicable) to the alarm incident quicker.

(Interviewee 11)

Time is an important factor, the manual system is slow with delays when picking up the phone, dialling the police, getting it answered and verifying the information and signing-off. This takes on average 90 seconds, whereas the new automated system would, I hope, be instantaneous.

(Interviewee 12)

- 5.17 However, ARCs would still be required to undertake the filtering role and the greatest concern was the risk that non-matching data (e.g. addresses, wrongly entered URNs) would cause errors in the system that could take longer to sort out than they would via a manual system:

Automation is less forgiving of poor data, for example, if a URN number has been transposed it can lead to a whole cycle of calls and extra work as it fails to get through the system.

(Interviewee 3)

It could be harder to close down false alarms and 99% are false.

(Interviewee 2)

- 5.18 Two interviewees commented on the additional complexity of automating lone worker monitoring (and CCTV to some extent):

Lone workers - can't be automated - at the moment they listen in to see what's happening.

(Interviewee 2)

We provide context to police verbally so that police can quantify their response. The difficulty is that lone worker dispatches are small in number and the police control operators can need a lot of guidance. Alarms are mobile so ARC has to provide location details ... Maybe they could add additional categorisation to the alerts; degree of variation is significant but not insurmountable and they would like to increase efficiencies in the alarm handling.

(Interview 10)

- 5.19 Many of the interview respondents demonstrated limited understanding of how the automated system would work in practice, which impeded their enthusiasm for its implementation:

Not sure how automated service would work - or what info could be transferred. Downside of automation would

be the granular detail of what's going on. Could this be typed in? Would be quicker to talk to someone?

(Interviewee 6)

We deal with many Asian companies - ARC controllers speak four different languages - how can that be translated into an automatic system? Some parts could be automated - others couldn't. Could auto system be overridden by manual if required - e.g. to stand down a call?

(Interviewee 7)

5.20 Essentially, all of the interviewees agreed that any benefits of automation will rely on good quality data and there would be an increased workload on ARCs (certainly in the initial phase) to achieve this.

5.21 It was also hoped that automation might help with the issue of URNs:

Currently, the process can take one month - with automation it should happen straight away as long as the data matches.

(Interviewee 5)

Would be good to find a better system for obtaining URNs as there are currently many delays. Some forces only accept cheques.

(Interviewee 8)

Auditing URNs is an onerous task. Every 2 years we check 20,000 records against the police systems. We try to set machines to do this up to a point - could be much quicker in the 'new world'.

(Interviewee 5)

One area that is a problem is not getting feedback about whether the alarm incident was genuine or a false alarm. The resolution code generated by STORM (or equivalent) is not passed back to the ARC. The client and the installers will be informed, if the police have suspended the URN and therefore will not attend an alarm incident, but the ARC may not know this and may still put a call through. This can be further complicated as the system may be upgraded after a false alarm by the installers and therefore the URN will be reinstated and therefore valid. It could be though that it is ignored or not upgraded and therefore the suspended URN, after a set period of time, deleted.

(Interviewee 11)

5.22 Interviewees were less certain about how automation would assist with the police response. A small number perceived a future where automated alerts could be forwarded directly to an available patrol vehicle. Others felt that automation would be unlikely to improve the efficiency of the police response. A key issued raised by one

interviewee was the time taken for police to attend the site and uncertainty about why some alerts resulted in attendance and others didn't:

If these (cited above) are the problems, how is automation supposed to help?

(Interviewee 7)

We often use visual verification to direct the police. Without enhanced data transfer, we would lose this.

(Interviewee 2)

- 5.23 Three interviews expressed concern about being able to document their response to the alarm and felt that a manual call between the ARC and the police offered better reassurance to the customer:

What sort of confirmed signal will be required? How will we know that the police have attended; that the signal has got through successfully. How do we feedback to the client?

(Interviewee 2)

Impact on uncertificated ARCs

- 5.24 There was more agreement amongst the survey respondents that automated alarms would be bad for uncertificated ARCs (9:2 out of 18) and especially that they would be good for certificated ARCs (13:4 out of 19), although the vast majority of those expressing an opinion (12:2 out of 18) felt that uncertificated ARCs will find a way around automation.

- 5.25 The interviewees were hopeful that automation (and in particular the requirement for more robust data) would help to keep uncertificated ARCs out of the market but were also aware that it is very difficult to stop them from dialling 999 in order to get a police response. Half of the interviewees felt that it was up to the police to manage this problem but conceded that the police are in a sensitive position with regard to 999 calls. For example:

It would be good to eliminate these but this depends on the police and ultimately, it is a civic service and anyone has the right to call 999. The Police don't have the capacity to filter 999 calls.

(Interviewee 3)

To be honest, I have my doubts whether automation will get rid of uncertified ARCs. We know now that ARCs get through and get URNs, so it doesn't currently work, so we need to enforce the rules more. Maybe, along with the electronic system, they need Government backing.

(Interviewee 12)

Impact on costs

- 5.26 Many more (10:2 out of 18) agreed than disagreed that ARCs would spend just as much time verifying information. Opinion was divided on whether it would generate more costs or benefits for ARCs (6:5 out of 19), and whether it would result in ARCs employing less staff (8:8 out of 18).
- 5.27 The issue of costs was tackled with a specific set of questions although many did not respond here presumably because they lacked the insight. Twice as many (10:5 out of 19) disagreed than agreed with an assertion that automation will reduce operating costs. Although opinion was divided amongst the minority who expressed a view on whether costs for police control rooms would be affected (4:5 out of 17); it was clear that the more disagreed than agreed (8:4 out of 19) that automation would reduce police operating costs. There was a tendency to feel automation would not result in increased costs for customers (10:3 out of 19) nor lead to a more efficient service for them (8:6 out of 18).
- 5.28 The interviewees gave more detail on how they anticipated automation to have an impact on costs, though given the lack of knowledge about the model and proposed funding, these responses were largely speculative. That said, all of the interviewees that commented felt that the greatest cost savings would fall to the larger ARCs, where, for example, savings of around 30 seconds per alert would scale up sufficiently to enable them to reduce the headcount. This is not withstanding previous concerns that errors caused by inaccurate data could prolong rather than shorten the alert handling time. For smaller ARCs, adherence to the NSI requirements for two operators to be on duty at any one time meant that there was little room for manoeuvre on staffing levels:

The savings will be to the police - not ARCs - can't reduce the numbers of staff in ARC – we need two to comply with NSI standards.

(Interviewee 2)

If anyone is going to accept it, it will be the ADTs, Chubb who are using seven or eight controllers at any one time. They may be able to reduce numbers - not those using two.

(Interviewee 2)

Not sure how the process would be funded. We currently pay a fee to the police for their ex-directory details. Would we have to pay for automation?

(Interviewee 4)

- 5.29 Further to the survey findings, two of those that disagreed that automation would reduce operating costs for police control rooms pointed out that alarm calls only accounted for around 3-5% of control room traffic (and most of the time saving would arise before the alert

reached the police control room). Thus, they were unlikely to achieve significant benefit even with a reduction in false alarms, which may not be significant in the first instance (though enhanced video verification may help with false alarms and with guiding the police response):

Tried to persuade one police force to adopt automation. For a big ARC - reducing seconds on calls could be significant. Police - alarms account for only 3% of traffic - they couldn't lose an operator on that basis. It is difficult to make a business case to the police as ARCs already filter out most false alarms.

(Interviewee 3)

- 5.30 All of the interviewees noted that there would need to be an initial investment in software (to support an interface with the police) and in software maintenance and cyber security but were not sure where these costs were likely to fall, though some would inevitably fall to the ARC. Most respondents felt that the police would be reluctant to incur additional costs, for example:

Ultimately, we've got to put some network between the ARCs and the police, and someone has got to pay for that. I suspect the police won't. Therefore, I would like to see the industry supporting this. The cost could be absorbed by the ARCs and maybe the installers.

(Interviewee 12)

The challenge is actually getting the connection in the first place. Dealing with alarms is not a core activity of some police forces, therefore, getting them engaged in the first place and them allocating resources to it is key. We have the software in place to do it, so we just have to wait for them.

(Interviewee 11)

- 5.31 Three respondents pointed out that as a national initiative, it was more likely that efforts would be made to ensure that it was financially viable for all parties and some suggested that as it was in the public interest, there should be some Home Office support:

In my previous experience of automation - one IT guy spent half his time talking to police forces to address software issues. A smaller ARC wouldn't have that capability. Smaller ARCS would need help and investment.

(Interviewee 3)

At current, the cost to ARCs for the manual system is a telephone call. For smaller ARCs with low alarm traffic upgrading to an automated system might be more costly and disadvantageous to them, than for larger ARCs.

(Interviewee 11)

- 5.32 The other key cost to ARCs was the additional administrative burden in reviewing and updating the data to ensure the smooth running of the automated system:

Will be a big job to clean all of the databases to start with. At the moment - the first time you know there's a problem is when there's an alarm (could have been on the system for 2 years). The police need regular updates from ARCs. After an initial clean it should be quite straightforward to keep things updated.

(Interviewee 9)

- 5.33 Less was understood about the impact on the operating costs of installers and end users and where it was felt that an impact might be likely, this was based on costs being passed down from ARCs or from the police in raising the cost of issuing an URN:

Installer, end user - good question - maybe? However, after initial costs, everyone will benefit - may be some passed down costs (based on level of service) but unlikely to be a massive uplift.

(Interviewee 10)

Unlikely to affect installers unless the police put up the cost of obtaining URNs to cover increased costs.

(Interviewee 3)

Impact on the role of ARCs and the development of the industry

- 5.34 Interviewees were asked what the impact of automation might be on the role of the ARC. Most felt that the overall role of individual ARCs would be unlikely to change. Within that role, there was a view that the monitoring role would be likely to move towards further video verification and that the management of data quality would become more prominent:

Don't think role would change - but will drive ARCs to be more aware of data and validation and this will help the police. Overall, it's good to raise standards.

(Interviewee 3)

Role of ARCs - focus would shift to data quality - who is updating, who is managing and who is providing data quality assurance? ARCs would need some reassurance from customers of QA. Would need to be an upfront review of data. Also, police are pushing for visual verification, which would still need human judgement, despite developments in video analytics. So role won't change but may switch to video verification.

(Interviewee 10)

- 5.35 As far as the development of the industry was concerned, most interviewees that had an opinion felt that it wouldn't have much impact:

People shouldn't worry about control rooms being automated or redundancies. Automation will save time but not to the extent of losing headcount. I don't fear over people's jobs.

(Interviewee 12)

- 5.36 One respondent, however, felt that it would provide a significant opportunity for expansion for ARCs across the board:

Automation would allow ARCs to be much more scalable - time saved on each call will lead to reduced headcount. Smaller ARCs in particular would be able to grow.

(Interviewee 10)

- 5.37 Three interviewees pointed out that the market was changing anyway and that smart phone technology, for example, will provide increasing alternatives to the ARC model. This could also have an adverse impact on the police:

About 15 years ago 1 million alarms generated around 1.5 million calls to police. Now 1.5 million systems generate around 200,000 calls to police. Improvement has come about through filtering e.g. ARCs. Smart phones could take things back 15 years by putting alarms straight through to police.

(Interviewee 5)

Overall benefit of automation

- 5.38 Respondents were asked to assess the benefit of automation to the relevant parties as shown in Table 1.

Table 1: Survey respondent views on the level of benefit to key groups

Group	High/Moderate (n)	Low/None (n)	Total responses
Police	14 (8/6)	3 (2/1)	19
ARCs	11 (8/3)	8 (4/4)	19
Insurers	9 (5/4)	7 (4/3)	19
Installers	7 (1/6)	11 (4/7)	18
End users (companies/public)	5 (3/2)	12 (5/7)	18

- 5.39 On this evidence the police service is seen as most likely to benefit and end users the least. Clearly this is not sufficient insight to draw any meaningful conclusions but it does merit further research.

- 5.40 With the caveat that the numbers or funding implications were not yet known, most of the interviews felt that the costs would ultimately be justified and would be absorbed into normal operating costs. Although for the organisation specific ARCs, this was not necessarily perceived to be the case.

Additional benefit of enhanced (video) verification

- 5.41 The sample was divided when asked to address statements on the value of video verification. The sample was more likely to agree than disagree that video verification will reduce false alarms (11:5 out of 19); that a higher police response should be given to video verification (14:1 out of 19); streamed CCTV would assist the police (14:2 out of 18); additional information in the form of extended Format Reporting would help the police improve their response (11:2 out of 19); and that a reduction in false alarms would result from enhanced verification (13:2 out of 18). The sample was divided though on whether video verification should be required for new alarm installations to merit police response (8:9 out of 18).
- 5.42 The interview responses were generally positive about the benefits of video verification, though some practical issues were raised. These included: the difficulties in distinguishing between legitimate presence on site and bona fide intruders; the increased time required to assess video footage; the problem that limited and poor quality CCTV coverage could make accurate judgements difficult and the fact that it would be unlikely to assist the police arriving after the event had taken place (though could be of some evidential benefit).

Yes, agree that video verification is the obvious solution to reducing false alarms. More effective but will take longer to review by ARC handler.

(Interviewee 10)

Yes, video verification gives a more informed response but how does that help the police if the event has already happened. Police don't give video a different response to sequential alarms. May assist the monitoring but they also take longer to handle. Not convinced that the capture rate is higher but better for evidence. But as with all CCTV- quality is an issue.

(Interviewee 3)

Video is subjective. Can have analytics doing clever things but is very expensive and is it worth it? Would be useful to deliver images to officer on site but again subjective to that officer. Additional info might be useful for response but wouldn't decide whether police attend or not.

(Interviewee 5)

Video verification and other files may help inform police response, the problem is that all forms of verification are not fool proof. We need to get to stage one first though, before considering this. I know the police want it and find it useful.

(Interviewee 12)

- 5.43 The additional costs of video verification were also mentioned:

Again, the end customer will end up spending money on CCTV and software and monitoring. It won't necessarily reduce false alarms; it can take time to identify the individual without a tannoy system.

(Interviewee 7)

Industry response to ECHO

- 5.44 Of the 19 who answered, 11 had heard of ECHO, and most who expressed a view were positive about it, for example:

I think that the ECHO Project is great and something that the industry has wanted for a few years.

(Interviewee 12)

- 5.45 Just over half of the interviewees were reasonably informed about ECHO while the rest had little or no knowledge of it. Those that were aware of it saw the potential but it was generally agreed that the goal to achieve automation by 2020 was ambitious, for example:

... firstly, it is no one's day job and secondly, there is nobody really driving it.

(Interviewee 11)

- 5.46 It was seen to be a significant technological challenge and there was some uncertainty that all forces would adopt it, thus necessitating a part automated and part manual system within ARCs. Others were more optimistic about the ability of forces to incorporate the changes.

ECHO - Yes, seen some of the documents and think it has potential but 2020 is a tall order to get up and running with 43 forces. There is generally a 12-18 month lead in time to get into Police IT systems/ secure networks. But, should be a proof of concept by then that will help to sell the project and speed up the response.

(Interviewee 10)

Summary

- 5.47 In summary, the putative benefits of automation were not fully appreciated by ARCs, though the interviews revealed that the majority of ARC representatives consulted were not informed of how any

system would work and the cost implications. Among those who had greater knowledge and experience of automation, the responses were more likely to be positive and the perceived benefits articulated. Suffice to say, if automation is to be commonplace, it has to meaningfully engage ARCs, and for that a programme is required.

Section 6. Concluding Comments and Recommendations

- 6.1 The police have for many years been proactive in seeking to improve the process and the information source on which they base their response to alarm activations. The most recent development has focussed on automating the process so that it is quicker, accurate and allows them to in time build in other technologies such as CCTV images or audio from the scene to improve their response. While the drive towards automation presents merit to the police service in rationalising its approach, there is a commercial reality for ARCs in ensuring that those they receive a fee from to manage a response get a worthy service. In short, improving the police response is in the interests of all parties. That said, what has also become clear is that while it is tempting to talk about 'the police' as if it is a single entity, the approach, commitment to, and readiness for automation of alarms varies considerably across forces.
- 6.2 While the police and alarm experts interviewed believed that the manual system is in need of reform, this view was less prevalent amongst the ARC representatives surveyed and this report has detailed some robust defences of the manual system. There was a caucus that disagreed for example that manual systems caused false alarms, or that there was any confusion when reporting details to the police. Indeed, ARCs highlighted some of the benefits of the human element, in clarifying and checking details and in building a rapport with the police for example. Some expressed concern that there might be implications if the people oversight was lost. Nor did many agree that automation would be better at providing more accurate data for the police, or overall be better.
- 6.3 Indeed, there were other areas where more clarity is needed. For example, there is still much to be done to connect ARCs to police networks. The process of engaging police forces first and then their IT departments is not an uncomplicated one. Clarity is needed on the technical solutions that are being posed and what the implications are for ARCs and police forces. Moreover, the methodology for paying for connections to the police network is still unclear.
- 6.4 Those closest to ECHO are supportive of it believing, for example, that it will speed up the process of reporting and responding; improve the (currently cumbersome) process of issuing URNs (on this issue there was considerable optimism); and facilitate easier auditing of events. But as far as ECHO is concerned there are still many areas where knowledge is slight. Many of the purported benefits of ECHO are still to be exhaustively tested and this includes how it will be cost effective;

whether it will result in more coordinated data sharing; whether police networks can be developed to provide for a national solution; how much data inaccuracies will disrupt the process and how long it will take to rectify these.

- 6.5 There was general agreement that automation generally and ECHO specifically may help to undermine non compliant companies, but that will in part depend on how the police choose to respond to alternative reporting methods. There was optimism though that in this way automation could help raise standards in the industry although there is a concern that non-compliant companies will find a way around the system.
- 6.6 In a different way automation provides for the opportunity to link alarm response with other data, for example CCTV images. But there are some practical hurdles to be managed, for example this process may take longer, and some images are poor, and these ideas need working through. In interviews it was noted that there is a police concern that some ARCs are not ready for automation. Certainly much more information is needed on what the implications are of automation on different stakeholders. The issue of costs features prominently here. Even as far as ARCs are concerned there were thoughts it may impact on small and large ARCs differently, and while there were certainly those who associated automation and ECHO with reduced costs not all agreed or understood how this might work in practice.
- 6.7 One other point needs to be made. Automated technologies are becoming commonplace, albeit that the advantages and drawbacks are still not fully understood. This report has focussed on intruder alarms, more work is needed to assess the implications for other types. And as technology develops it may change the way ARCs work. Some felt they may be more engaged in video verification, others in data veracity, and there was potential there to expand their remit. Perhaps the growing use of smartphones to report incidents will undermine the need for ARCs or change the way they operate. This is an area where change is ever-present and so too the need for research.
- 6.8 There is considerable enthusiasm for automation, most notably from those that are most familiar with it. But even amongst this group, and certainly amongst those that are not informed or less so, a range of questions and concerns – not least those raised in this report - need to be addressed. Indeed, one of the striking findings from this research is that there is a lack of awareness about what the implications of automation are, so much so that there is a poor information base on which to assess the implications for all parties. In the case of the police prominent variables are whether the force is currently connected to a specific network and its size, for example whether it sees alarm response as a pressing concern. ARCs vary in size and orientation (including the type of clients and types of alarms they service) and deal with different police forces (only some work nationally) and so

automation will likely impact them in different ways. The implications for installers and end-users may well be favourable but the issue of costs at least are not fully understood.

6.9 It is likely the ultimate success of the move to automation will be not insignificantly dependent on addressing these concerns fully and well. We have outlined the key steps in the recommendations we listd at the beginning of this report. Those responsible for ECHO have painted a very positive picture of how things could be. The vision they have created now needs to be articulated to the range of stakeholders involved. Some for sure will need convincing; there are some real concerns that have not been adequately addressed yet. At the sharp end of practice experience has shown that change is not an unqualified good. That said the considerable optimism there is for ECHO amongst those that know about it offers a good base to develop an effective implementation and communication strategy; if done well it will help turn many who are sceptical or ambivalent into supporters.

6.10 In summary the recommendations are:

- There is a need to raise awareness of ECHO
- An implementation plan with a timetable for ECHO needs to be developed and publicised
- There needs to be more clarity on costs, what they are and where they will fall
- There needs to be effective engagement between ARCs and the police
- There needs to be more awareness of the potential of automation – alongside other technologies - to help the police
- There needs to be an assessment of police capability to manage automation
- More awareness is needed on the opportunities for automation of other types of alarms
- Clarity is needed on the potential to connect all police forces

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Appendix 2: Abbreviations used in this report

ACPO – Association of Chief Police Officers (Dissolved 2015)
ARC – Alarm Receiving Centre
ATSVIVR – After Theft Systems with Vehicle Immobilisation for Vehicle Recovery
BSIA – British Security Industry Association
CCTV – Closed Circuit Television
CPI – Crime Prevention Initiatives
CRN – Crime Reference Number
ECHO – Electronic Call Handling Operation
FSA – Fire and Security Association
GDPR – General Data Protection Regulation
HMIC –HM Inspector of Constabulary
HUA – Hold-up Alarm
IA – Intruder Alarm
IAS – Intruder Alarm System
ISA – International Society of Automation
JSaRC – Joint Security and Resilience Centre
LWD – Lone Worker Device
NPCC – National Police Chiefs Council
NSI – National Security Inspectorate
PNN – Police National Network
RMDACCTV – Remote Monitored Detected Activated CCTV
RVRC – Remote Video Response Centre.
SOC – System Operating System
SSAIB – Security Sector and Alarm Inspectorate Board
UKAS – United Kingdom Accreditation Service
URN – Unique Reference Number

Appendix 3: Methodology

Review of Previous Research

To provide a context for the research, a review of existing literature was undertaken. Open source documentation, information provided by interviewees and academic literature was considered and integrated to outline how alarms operate, the current police response to alarms, the NPCC guidelines on the police response, the role of Alarm Receiving Centres (ARCs), what automation is and the potential benefits and limitations and finally relevant future developments in the security and alarm industries.

This was followed by two main approaches: a survey of representatives from Alarm Receiving Centres (ARCs) and semi-structured interviews with a range of professionals with experience of the automation process.

Survey

The aim of the survey was to gather the views of ARCs, since they play a pivotal roll in the process. A definition of both the manual system and the automated system were provided at relevant points within the survey.

The survey addressed views on:

- The strengths and limitations of the manual system
- The strengths and limitations of the automated system
- Potential impacts of automation on ARCs
- Potential impacts of automation on police and customers
- The level of benefit automation may hold for key groups
- The potential of possible further enhancements to automation
- ECHO

A combination of multiple choice, rating questions and open comment boxes was used.

The survey ran from 5th to 22nd January 2018.

A total of 21 replies were received although not every respondent completed every question in the survey (for the majority of questions around 19 responses were received). The data was analysed using excel.

One-to-one interviews

The approach in this work was to identify a wide range of individuals with knowledge or experience of alarm automation to help clarify the current position, learn from any outcomes to date, and understand the benefits and challenges for expanding the use of automation.

24 interviews were undertaken in total. These are broken down as follows:

- 12 ARC representatives (8 of which were sourced via the survey)
- 6 representatives from police forces (4 of which were involved in trialling the automatic connection)
- 3 alarm industry experts that are a part of the ECHO team
- 3 representatives from security system installers

The interviews were semi structured, ensuring a consistent approach but enabling perspectives to be explored in more depth where appropriate. They were conducted by telephone, and interviewees were informed that participation was voluntary and anonymous. Interviews were conducted during November 2017 (to inform the research and also the drafting of the survey questions) and during February 2018 (to further explore the survey findings).

For the interview findings we adopted a framework analysis approach²:

- Familiarisation with the data – achieved by reading the interview transcripts and survey responses.
- Identifying a thematic framework – noting key phrases and ideas arising and developing these into categories of findings.
- Indexing – sifting the data, highlighting and sorting illustrative responses and making comparisons within and between these.
- Charting – lifting the responses from their original context and re-arranging them under the newly-developed thematic content.
- Mapping and interpretation – building the relationships between the responses and the links between the data as a whole.

Finally the findings were organised and written up in report format.

² Ritchie and Spencer. 1994

Appendix 4: About Perpetuity

Perpetuity Research is a leading research company with wide expertise in both quantitative and qualitative approaches. We have been extensively involved in evaluating 'what works' (and what does not). Our work has involved helping our clients to understand people's behaviours, perceptions and levels of awareness and in identifying important trends. Our mission statement is 'committed to making a difference', and much of our work has a practical application in terms of informing decision making and policy formulation.

We work closely with our clients. This includes businesses, national and local governments, associations and international organisations as well as charities and foundations. Our aim is to exceed their expectations and it speaks volumes that so many have chosen to work with us repeatedly over many years.

We work with Police CPI to manage the Secured Environments certification (www.securedenvironments.com), and our research help found the Outstanding Security Performance Awards (the OSPAs) (www.theospas.com).

Appendix 5: About the Authors

Professor Martin Gill

Martin is a criminologist and Director of Perpetuity Research which started life as a spin out company from the University of Leicester. He holds honorary/visiting Chairs at the Universities of Leicester and London. Martin has been actively involved in a range of studies relating to different aspects of business crime including, the causes of false burglar alarms, why fraudsters steal, the effectiveness of CCTV, the victims of identity fraud, how companies protect their brand image, the generators of illicit markets and stolen goods, to name but a few. Martin has been extensively involved with evaluation research and with the offender's perspective looking at how they target certain people and premises and aim to circumvent security measures. He has published 14 books including the second edition of the 'Handbook' of Security' which was published in July 2014. Martin is a Fellow of The Security Institute, a member of the Company of Security Professionals (and a Freeman of the City of London), he is a member of the both ASIS International Research Council and the Academic and Training Programs Committee and a Trustee of the ASIS Foundation. In 2002 the ASIS Security Foundation made a 'citation for distinguished service' in 'recognition of his significant contribution to the security profession'. In 2009 he was one of the country's top 5 most quoted criminologists. In 2010 he was recognised by the BSIA with a special award for 'outstanding service to the security sector'. In 2015 and 2016 he was nominated and shortlisted for the Imbert Prize at the Association of Security Consultants and in the latter he won. In 2016 ASIS International awarded him a Presidential Order of Merit for distinguished service. In 2016 IFSEC placed him the fourth most influential fire and security expert in the world and in the same year he was entered onto the Register of Chartered Security Professionals. Martin is the Founder of the Outstanding Security Performance Awards (the OSPAs).

Charlotte Howell

Charlotte joined Perpetuity Research in January 2009, and is currently the Research Manager – responsible for managing the delivery of research contracts, and our team of research staff. She also manages the Secured Environments scheme run by Perpetuity Research on behalf of Police CPI. Charlotte is an accomplished project manager with experience of working with a range of clients including businesses, associations, police forces, government organisations and charities. Charlotte's knowledge and experience spans the range of our areas of expertise – including crime prevention and community safety, security research, and the social aspects of health research. Charlotte is also actively involved in delivering fieldwork and has consulted with a range of individuals, including stakeholders (such as individuals from the police, local authorities, service commissioners and staff),

offenders (both in prison and in the community) and clients accessing services (such as drug and alcohol treatment services, domestic abuse services and support services for sex workers). Charlotte is adept at quantitative analysis and has a wealth of experience analysing survey responses, client/service data and performance/outcomes data. Prior to working for Perpetuity Charlotte graduated from the University of the West of England with a first class LLB (Hons) in Law in 2003. Following this she received a MSc in Criminology from the University of Leicester. After graduating Charlotte worked for the Leicestershire Criminal Justice Drugs Team, analysing and reporting on Class A drug misuse and treatment information, to maintain and improve performance.

Dr Janice Goldstraw-White

Janice is a criminologist with expertise in the areas of crime, governance, audit, risk management and security. With more than 20 years' experience as an accountant, mainly in the public sector, she is particularly interested in crime in the workplace, fraudster behaviour and the role of women in white-collar crime. She has extensively researched in the area of white-collar crime both here and in Australia, with a focus on offender accounts of criminal behaviour. She has particular experience in interviewing within prisons and has undertaken over fifty interviews with incarcerated white-collar offenders. Janice has published a number of articles and co-authored separate chapters in books on workplace crime and the motives of white-collar criminals. Her own book entitled 'White-Collar Crime: Accounts of Offending Behaviour' was published in October 2011.

Sarah Webb

Sarah Webb has been a social research and evaluation consultant since 1995. Sarah has completed a number of significant projects, for Government departments, local authorities, and national umbrella organisations mainly involving the criminal justice service, substance misuse and mental health. Sarah has been involved in a number of national evaluations including the Challenge and Support Programme (DCSF), the Youth Inclusion Programme (YJB) and the DNA Database Expansion Programme (Home Office). She was also a member of the senior management team for the MOJ/ YJB flagship project, the Juvenile Cohort Study. Most recently, Sarah's work has largely been focussed in the areas of policing, organised crime, illegal immigration, youth crime and anti social behaviour, education and inclusion and railway suicides. Sarah's particular area of expertise is in qualitative research and evaluation and she has considerable experience of overall project design, developing questionnaires, conducting interviews, facilitating focus group, analysing qualitative data using software packages such as NVivo and MaxQDA and report drafting including published research papers.



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