Developments in call centre and network answer phone detection

Final Report

October 2013

Ofcom
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This report reviews developments since 2009 that affect the use of Answer Machine Detection (AMD) in outbound call centres and the resulting consequences of these developments for consumers. AMD is designed to provide efficiency benefits for call centres by detecting network based answering services and physical plug in answering devices but its use can also result in silent calls for consumers. This occurs when a live response is mistaken for an answering machine and the call is terminated. The report describes recent developments and draws conclusions about the current situation as an input to Ofcom's wider consideration of this topic.

AMD works in two ways. The standard approach is to examine the voice pattern response once a call is established, taking account of the time taken to respond. This works in all situations but with varying accuracy. A second approach is to use network signalling to report that a call is about to be transferred to an answering service. This is a more reliable approach but it is largely unrealised, especially in the UK. It is also more restricted in that it works reliably with network answering services but will not detect physical answering machines because the network is typically unaware of these until a call is established.

Since 2009, when an earlier review of AMD was conducted for Ofcom by Verint Consulting, the telecoms landscape has continued to evolve. Network answering services are increasingly used on fixed lines and the proportion of mobile and VoIP calls is also increasing. Overall this has led to greater regularity in voicemail responses as fewer users personalise their greeting message with network services. This regularity helps the standard detection process.

Voice pattern or 'cadence' based AMD has shown only limited advances since 2009. There is strong evidence from interviews that many call centres are not using AMD now because of concerns about exceeding Ofcom's 3% limit on the proportion of abandoned calls. In fact there were some indications that not using AMD encourages call centres to improve their contact profiling and hence achieve better contact rate results. AMD is still in use however, particularly for specific applications such as debt collection and campaigns with poor contact data. The bit pattern recognition approach improves the detection of standard network voicemail services with standard responses and gives very high levels of accuracy with these cases. Personalised greetings and non network answer phones remain more difficult to detect and these will still dilute the overall accuracies which are still likely to be too
low. If non-standard responses are routed to agents this approach is a possible way forward for cases where AMD is particularly important, such as in debt collection.

Network based AMD offers the theoretical benefit of accuracies that would allow call centres to operate within the Ofcom Statement of Policy, but the network functionality to support its use is not currently available in the UK. The emphasis at present, including the work of the Network AMD Working Party, is on using ISDN signals to provide a clear cut indication that a call will be routed to a network answer service. A similar approach is used in Germany, but relies on a different implementation of the ISDN standards. The aim is to develop an approach initially in ISDN but that will also be SIP compatible. This approach is technically feasible but has important external dependencies.

Proper implementation of full Network AMD would require substantial effort on the part of network operators, including interaction with the standards bodies. Given that the main beneficiaries of this would be the call centres it is not clear why operators would be motivated to provide such a service, except perhaps to reduce the network load from unanswered calls. If suitable funding was made available however, this type of service could be provided. The other option would be for the regulator to require operators to provide such a service for the benefit of consumers. None of these network AMD services would detect physical ‘plug-in’ answer machines because these cannot become known until a call is connected and in progress.

BT has developed a prototype that can use CLI to signal back to the call centre. As yet this development has not been finalised or marketed but potentially could be widely used by call centres.

The report also considers consumer based devices and services which can be used to provide protection for the consumer with a means to screen calls and to route unwanted calls to the built in answering device. Though effective, these services require the consumer to invest and they are intrusive in that wanted calls are likely to be diverted to the answering machine in some cases.
1 Introduction

1.1 Objectives

The purpose of this study is to review recent developments that affect the use of Answer Machine Detection (AMD) in call centres and the resulting consequences for consumers. The work provides an update to the review carried out by Verint Consulting in 2009. In this context ‘AMD’ includes detection of network based answering services as well as physical 'plug in' devices provided by the consumer. The report describes and draws conclusions about the current situation and developments since 2009 as an input to Ofcom's wider consideration of this topic.

1.2 Rationale

AMD is used by outbound call centres in conjunction with their Automated Calling Systems (ACS). By detecting an answer machine or service response, AMD allows a call to be terminated and hence the agent will be presented only with calls that have a live response. This provides efficiency benefits for call centres and reduced loading on the phone network, though the extent of such benefits also depends on other factors such as the quality of the target information. Most ACS equipment is supplied with AMD and can be used with or without it switched on.

The main issue with AMD is that it causes silent calls for consumers when it mistakes a live response for an answering machine and terminates the call. This is known as a False Positive (FP). The converse is False Negatives (FNs) where the system fails to identify an answering device or service and passes the call to an agent whose productivity is thereby reduced.

Recent developments in analysing voice responses and potential developments in network signalling are said to provide potential for improved AMD performance with fewer silent calls. This report seeks to assess the extent of these improvements, their functional impact and expected timescales for operational use. The report also considers the effects of devices deployed by consumers to screen incoming calls.

1.3 Regulatory context

Ofcom has powers to take action against persistent misuse of electronic networks or services conferred from Sections 128-130 of the Communications Act 2003 (The Act). It is considered that originating...
silent or abandoned calls could cause unnecessary annoyance, inconvenience or anxiety to the called party and thus persistently making calls of this nature is deemed to be misuse of the network or service under the Act.

Where a party contacts UK consumers either by using the network themselves or by engaging a third party, the persistent origination of silent or abandoned calls can result in investigation, enforcement and penalty procedures under the Act.

Ofcom issued a revised statement of policy on the persistent misuse of an electronic communications network or service in 2010 which updated the statements issued in 2008 and 2006.

The revised statement provided clarity around the use of AMD with ACS. Ofcom worded the statement to seek a balance between minimising consumer annoyance and distress and providing scope for innovation and efficiencies in the call-centre industry. As such the use of AMD was not banned but parameters around its acceptable use were specified.

For consumers False Positive calls result in dropped or most likely silent calls. However because the call centre systems have classified these as being picked up by an answer machine, they are not, by definition, treated as other abandoned calls produced as a result of predictive dialling and agent availability. This means they will not be played a message or included in any unadjusted count of abandoned calls.

Ofcom’s Statement of Policy states that the users of AMD must include a reasoned estimate of false positives when calculating the abandoned call rate. This is on the premise that FPs are abandoned calls and must be treated as such.

1.4 Earlier work

A study undertaken for Ofcom in 2009 by Verint Consulting investigated the use of AMD. The objectives of this study, slightly different from the present one, were to:

\[1\]http://stakeholders.ofcom.org.uk/binaries/consultations/persistent_misuse//summary/verint.pdf
- Draw conclusions on the reliability of AMD, including identifying the factors which may influence the occurrence of AMD False Positives, and if practical, provide estimates of the reliability of AMD;
- Examine the scenarios which might affect the likelihood of a call centre utilising AMD being able to comply with the Abandoned Call rate as set out in Ofcom's Revised Persistent Misuse Statement;
- Identify types and sources of information available to contact centres which may be used by them to make a reasonable estimate of AMD False Positives; and
- Comment on the likely efficiencies or productivity gains that can be attributed to the use of AMD in call centres.

In 2009 Verint found there was a general consensus in the industry that there existed an issue with False Positives that had been highlighted by the revised Ofcom Statement of Policy issued in the previous September. Verint found that various factors influence False Positive rates and their findings are replicated in Table 2.1.

Verint also did work to investigate detection accuracy and false positive rates in various scenarios at seven sites. The report also reviewed test methodologies and suggested that Ofcom provide guidance in a number of areas to assist operators and provide further clarity surrounding the testing that is expected from them concerning FPs. The study concluded that although some operators were using AMD in compliance with the 3% rule, significant numbers could not run compliant AMD at a level that would provide them with significant operational savings.

The 2009 report also examined the technologies used in call centres including the AMD technologies in use at the time. A description of what the study referred to as the 'Standard Detection' was provided which is based on analysis of the voice call post answer. In addition there is a description of what is termed 'Early Detection' which is analogous to Network AMD, however it was acknowledged that at the time of the report this methodology was at a stage of emergence and no testing using this methodology was able to be undertaken.

The report did consider the effect of AMD on Call Centre performance both in terms of the operational performance of the agents and also in terms of business performance. The study concluded that AMD provided a significant operational benefit to call centre operations and also reported that collections businesses in particular reported they derived benefit.
In essence, the study found that multiple factors influenced the accuracy of AMD but that the technology employed was prominent among these and that there were on-going developments in the technology landscape. It found that the use of AMD could significantly affect a call centre’s ability to remain compliant with the requirements for the abandoned call rate. Methods of estimating False Positives and the take-up of these methods were identified and comment was also provided on the usefulness of AMD to call centres.

1.5 Scope of this study

Taking the 2009 study as a baseline, this present work examines the following topics:

- Technologies and methodologies available to call centres (either now or in the near future) to identify when a call has been, for example, diverted, dropped or answered by an automated system (e.g. voice mail);
- Consequences for customers that may result from the implementation of such techniques, in particular the potential levels of silent and/or abandoned calls;
- Factors that could facilitate or inhibit the use of such techniques, including costs (including call centre as well as network-level costs), technology challenges (such as interworking and standards), anticipated benefits and the current regulatory framework; and
- Potential implications arising as a result of a ban on non-network based AMD so as to reduce the potential for AMD ‘false positives’.

The work is to inform Ofcom’s approach to silent and abandoned calls.

1.6 Key lines of enquiry

The main inputs to the study have come from desk research and from discussions with industry representatives. In particular, interviews have been conducted with:

- Industry associations
- Solution vendors
- Integrators
- Consultants
- Outbound call centres
- Network operators
More detail on consultations is provided in Appendix B. We are grateful and would like to express our thanks to all those who have given their time to contribute to this work.

1.7 Structure of report

This report has the following structure:
- Executive Summary
- Technologies and methodologies
  - Overview of the technology landscape
  - Capabilities delivered by call centre equipment
  - Capabilities delivered by networks
  - Impact of end user devices
- Consequences for consumers
  - Impacts of AMD on consumers
  - Relative impacts of other factors
  - Use of call blocking equipment
  - Usage dynamics - the changing telecoms context and its effect
- Industry context
  - Regulatory background
  - Call centre operators’ choices
  - Views from the credit services sector
  - Views from the Direct Marketing Association
  - Enablers and barriers to uptake of AMD
- Conclusions
This Chapter covers the main technology aspects of AMD developments. The two main AMD technology solution types, call centre equipment capabilities and network capabilities are considered in turn. Following that, the impact of the growing but still relatively small range of end user equipment is examined followed by a brief review of international perspectives.

2.1 The technology landscape

This section provides an overview of the environment and influencing technologies with an emphasis on developments since 2009. This includes an overview of the specific AMD technology contributions and also the changes in the wider telecoms landscape that may affect call centre and consumer priorities.

2.1.1 Devices, networks and systems

Developments affecting call centre answer phone and network signalling detection mechanisms may be usefully grouped into three categories as summarised in Figure 2.1.

Figure 2.1: Overview of the technology landscape for AMD

In summary, the categories are as follows:
- **Call Centre**: The technical capabilities, and configurations, of systems used in call centres to detect whether calls have been answered by an answering device rather than a live person (see Section 2.2)
- **Network**: The technical capabilities of networks to determine whether a call has been or will be diverted to an answer machine or service (see Section 2.3)
- **Consumer**: Systems and devices available to consumers to help them control incoming calls of different types (see Section 2.4)

Developments in each of these categories are reported below.

### 2.1.2 Baseline assessment

The 2009 Verint report identified a number of factors and estimated their effect on the reliability of the AMD process. This is shown in Table 2.1 which also summarises some of the potential changes since 2009.

Technology factors (call centre systems, network and answering machine type) which are the primary focus of this work were identified as having the most important effect on the AMD accuracy and reliability. Environmental factors (caller location, demographic and timing of the call) were seen to have a lesser though still important effect.

<p>| Table 2.1: Verint 2009 factors influencing AMD and likely changes since 2009 |</p>
<table>
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<tr>
<th>Factor</th>
<th>Importance</th>
<th>Potential changes since 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of Dialler used</td>
<td>High</td>
<td>New products, settings and inclusion of different AMD options</td>
</tr>
<tr>
<td>Type of AMD equipment</td>
<td>High</td>
<td>New products &amp; algorithms; Potential network detection options</td>
</tr>
<tr>
<td>Degree of aggression with which AMD is set to classify Answer Machine (“AM”) pick ups</td>
<td>High</td>
<td>Changes in operator policies and priorities; Greater understanding of client base and call timing</td>
</tr>
<tr>
<td>The time allowed to analyse salutations</td>
<td>Low</td>
<td>Assuming 2 s rule adhered to; centre has no influence on this factor (i.e. only 2 s allowed for analysis); Revised Ofcom statement in 2010. Possible that new techniques may provide more accurate assessments in a shorter time</td>
</tr>
<tr>
<td>Telephone Type Called - Landline / Mobile / VoIP (e.g. Skype)</td>
<td>Medium</td>
<td>Proportions changed with consumer preferences. More mobile and VoIP with different voicemail characteristics</td>
</tr>
<tr>
<td>Where the consumer is likely to be at the time of the call and what is likely to be in the background</td>
<td>Medium</td>
<td>Broadly constant in line with type called. Call timing remains an important factor.</td>
</tr>
<tr>
<td>AM Type Used Analogue, digital home, digital network</td>
<td>Medium</td>
<td>Shift towards digital network. Availability of other user equipment options also relevant - eg TrueCall + BT 6500</td>
</tr>
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### 2.2 Capabilities delivered by call centre equipment

This section provides an overview of the AMD technology currently available in the market place in the UK for deployment in Outbound Call Centres.

#### 2.2.1 The cadence method

Almost all AMD currently in use remains based on analysis of voice pattern cadence by equipment linked to call centre diallers, a technique referred to in the 2009 Verint report as ‘Standard Detection’. Table 2.1 identified type of dialler, type of AMD and the way both are configured as the most significant influences on the silent call rate.

With Standard Detection, determination of an answer machine or service response is undertaken after connection of the call. This means that the time for this process is restricted to the two seconds permissible under the Ofcom Statement of Policy which states that all abandoned calls must have a message played within two seconds of answer. However a call classified as an answer machine response is not identified by the system as an abandoned call and will therefore not have a message played.

Time to answer can provide an initial indicator of likely response. Where answer time is not between about 15-21 seconds, the most usual delay prior to connection to an answer machine; a live response should be expected and the call passed to an agent. The main part of the method, however, uses analysis of the audio stream. In the initial two second period, analysis normally includes the following elements:

- duration of speech before the first lengthy pause
- tones used in the greeting
- comparison with patterns of standard answer service greetings
- factors such as the ‘hiss and click’ that was inherent from the use of the now less prevalent analogue answer phones.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Importance</th>
<th>Potential changes since 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographics Classification of Consumers called.</td>
<td>Medium</td>
<td>Related to the timing of calls. Possible greater emphasis on this as an alternative to AMD reliance</td>
</tr>
<tr>
<td>Calling Window When calls are made.</td>
<td>Low</td>
<td>Gaining increased recognition</td>
</tr>
</tbody>
</table>

Source: Verint 2009 (Factor / Importance) / Mott MacDonald (Potential changes)
This analysis is implemented using either software or hardware based Digital Signal Processing (DSP) techniques.

**Figure 2.2:** Comparison of audio patterns for live caller and answer machine

![Example Audio pattern for an Answer Machine Greeting](image1)

![Example Audio Pattern for a Live Person’s Greeting](image2)

**Source:** Mott MacDonald using Call patterns by Sytel Ltd

Figure 2.2 illustrates characteristic differences between an answer machine greeting and that of a live person. The accuracy of detection by the cadence method is limited by a number of factors including consumer location, call centre location, consumer device, consumer’s greeting and background noise.

In many cases the AMD equipment offers opportunities for tuning the sensitivity to regulate how aggressively the AMD classifies calls as having reached an answer device. If the AMD is set to categorise calls aggressively for a system it is likely that the False Positive rate would rise. Conversely making the AMD less aggressive leads to more calls to answer machines being sent to an agent.

**Figure 2.3** below illustrates the effect on the setting and accuracy of call centre AMD equipment on the production of False Positives and False Negatives. The rectangle equates to the entire volume of calls made by the call centre equipment with the left/top half equating to those answered by a live consumer. The lower/right half equates to those calls that reach an answer device. The line dissecting the box shows how the calls will be handled following connection with those above this line being passed to an agent and those below being terminated. The slope of this line depends on the accuracy of the detection process – where the detection is optimal the line will be exactly in line with the centre line of the rectangle. Where the accuracy of detection is less than optimal false positives and false negatives will result. The volume of these false positives and false negatives can be affected by changes to the sensitivity of detection in use by the equipment and this equates
to raising or lowering the dissecting line. However it should be noticed that without accuracy of detection, reducing the number of false positives has a reciprocal effect on the number of false negatives and vice versa.

**Figure 2.3:** Relationship between AMD settings and resulting error types

Source: Mott MacDonald

### 2.2.2 Bit pattern recognition

In addition to the traditional cadence based methods and the possibility of network based methods; there has been a limited level of innovation in the area over the past couple of years. One such methodology is based on intercepting the audio signal from the called party in its digital form prior to it being decoded back into speech.

A specific example of this approach is described in a patent application concerning “An Answer Machine Detection System using Network Level Binary Matching” filed on 1st February 2011 by DXI Limited. Figure 2.4 illustrates the system described in the patent in the context of this approach.
The methodology involves incorporating a technique known as Network Level Binary Matching (NLBM) into the AMD process. The NLBM module has a set of stored bit patterns as data samples which correspond to the patterns of known answer machine greetings. These stored samples are then used to attempt a match against the incoming binary data stream for the call. The technique relies on the fact that it is highly unlikely that an exact or extremely near match will be possible where the two samples of binary data are long, e.g. in excess of 1,000 bits, unless the audio is actually the same.

For the NLBM to be effective it is important for the answer device to transmit the same binary data stream each time it is encountered. For the digital answer machine services provided by the PSTN or mobile networks such as the BT 1571 service where the default greeting has not been personalised by the subscriber, these reliably transmit the same bit pattern for each calling instance. The NLBM technique will be considerably less reliable in use against analogue or other answer machines connected to the PSTN via analogue circuits where the
greeting is encoded into the digital form in real time for each call rather than playing the same, stored digital pattern each time.

The NLBM system described in the patent goes a step further in that it includes self-learning facets. It includes a facility such that bit pattern samples from calls that are not matched to the database of samples are stored in a second ‘dynamic call sample database’. These are then additionally compared against future call bit streams and where a match is found it can be assumed that a device other than a live human has answered, for example a personalised greeting on an answer service and this bit pattern is added to the database of samples.

The patent also describes how the NLBM technique can assist with call progress analysis where networks use messages such as “the number you have dialled has not been recognised”, which would be digitally transmitted and thus accurately detected by the NLBM technique. In these cases it is suggested that the NLBM system could pass a different message back to the dialler to inform call progress.

According to the patent, in trials where over 5,000 call recordings which had been classified by the NLBM system as having been answered by an answer machine were listened to manually, no false positive were found. The rate of false negatives, where calls answered by answer machines are connected to agents, will depend on the mix of answer machines in the sample population, however anecdotally it is believed that the use of digital messaging services, where this technique is effective and reliable, already predominates and the proportion of these in use is still rising.

2.2.3 Network signalling

Currently Network AMD where call centre systems use dedicated and conclusive messages passed via network signalling to conclude a call reliably because it will be answered by a network messaging service is not available. However, the use of messages indicating call diversions can add another way of reliably detecting calls that will not be answered at the intended answerpoint. The prospects for network AMD are considered in the next section.

Network AMD can only be used to detect digital messaging services and describes the ability to detect that calls are to be answered by one of these services before the call is connected. Currently it typically works by using the ISDN network messages associated with the
progress of the call. Network signalling messages to inform AMD
detection are not widely used in the UK and it could be argued that
Network AMD does not currently exist in the true sense in the UK
because of the lack of applicable messages from the networks².

One vendor we spoke to, IT Sonix, did describe how its dialler product
takes advantage of any available Euro ISDN signalling as it was
developed in Germany for Euro ISDN in contrast to diallers from other
manufacturers which are derived from products developed primary for
the US market where different standards are used. Although there is no
dedicated signalling to indicate the transfer of a call to an answering
device, there is some signalling available within the EURO ISDN
standard to indicate call diversion taking place and this can be used by
the IT Sonix AMD product. The product has been used more
extensively and successfully in Germany where IT Sonix note that the
network operators tend to adhere more strictly to the Euro ISDN
signalling standard and provide more reliable information about
diversion of calls. In the UK IT Sonix report that provision of this
indication via Euro ISDN compliant signalling is more variable, for
example for calls to the Orange network the chances of receipt of the
signal are small whereas for BT it is more than likely to be received
successfully. Although limited in its applicability, this technique can
provide a reliable means of detecting answering machines for a
proportion of calls and could be used in conjunction with other methods.

In addition to this, Aspect also reported that although in the UK its
solution currently monitors the beginning of salutation and then the
sound energy transmitted down the line, to determine whether it is an
AMD or live person, ie uses a form of the cadence method, it has had
success with network based AMD in Germany. It notes that the
limitation in the UK is due to no UK carrier currently offering this type of
facility to enable the network AMD approach.

2.3 Capabilities delivered by networks

Using signalling messages or tones produced by the network offers the
theoretical promise of highly accurate and reliable detection with zero
false positives.

If call centre systems can rely on a definitive signal or tone to indicate answer by a machine and otherwise pass to an agent then a false positive will not occur. False negatives may still arise where the answer machine or network cannot deliver the indication but although these may limit efficiency, they do not run counter to regulation.

This section examines the realistic possibilities for using this technology for AMD in the UK. This requires consideration of:

- The availability and possible applicability of current signalling protocols and/or the likely level of network changes required to facilitate usage;
- The application of tones and recorded announcements in telephone services in line with ITU-T Recommendation E.182 and ITU-T Recommendation E.180/Q.35;
- Investigation of Network Answer Machine Detection (NAMD) signalling software requirements i.e. ISDN or sound patterns or both.

The review considers the effect on the applicability of this approach of the telephone type called, whether Landline, VoIP or Mobile, and also considers the future landscape regarding line type and thus the future term potential for the technology.

2.3.1 Network signalling overview

Signalling is the process of sending network control information over fixed line and mobile networks to monitor, control, route, and set up sessions between different devices. This can include video and audio calls, data connections, and mobile and landline telephone calls. It is also used to set up instant messaging (SDS) and multimedia services (MMS) within public networks and the Internet as well as for cross carrier network connections and billing.

Signalling is used to process every call on the Public Switched Telephone Network (PSTN) and mobile networks. When a caller dials a number, he can hear progress tones called SITs (Special Information Tones) such as dial tone, ringing, engaged tone, or reorder tones. These are all audible signalling tones. In addition to tones, callers might hear digital messages informing them that the number they called is not in service or has been ceased to name just a few network functions.

The PSTN platform mainly uses Signalling System 7; IP networks mainly use variations of Session Initiation Protocol (SIP) as a common
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Interworking between different networks and in turn between the required signalling protocols is a very complex area and has many potential issues if not set up correctly and rules are not adhered to.

The ITU (International Telecommunications Union) defines signalling as, “the exchange of information (other than speech) specifically concerned with the establishment, release and other control calls, and network management, in automatic telecommunications operations.” The basic evolution in signalling between manual operators with automatic equivalent is shown in Figure 2.5.

**Figure 2.5:** Illustration of automated signalling functions by comparison to manual operator activities

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### 2.3.2 Signalling System No. 7 (SS7/C7) in networks

Signalling System No. 7, which is more commonly known in North America as SS7 and in the UK as C7, is both a network architecture and a series of protocols that provide telecommunications signalling. The vast majority of calls made on landlines are SS7/C7 TDM (Time Division Multiplexing) based.

Signalling System No.7 is the protocol that makes PSTNs operate within themselves and across national and international boundaries. Unlike ITU Q.931 standard, which is basically designed for simplicity,
SS7/C7 is a complete Internet like architecture and provides a set of signalling protocols.

**In band and out of band signalling**

Network signals can be carried across a network in 2 different ways, “in-band” and “out-of-band” signalling. Until the early 1970s, PSTN used in-band signalling to relay signalling information. This system was limited in the number and types of signals that could be sent, and it became increasingly slow as more features were added to the PSTN platform.

In today’s digital world, out-of-band signalling systems are mainly used. This provides the capability to accommodate the transmission of circuit and network management, the subscriber and billing database information used by carriers to manage circuit connections. The out-of-band signalling system used today is called Common Channelling Signalling (CCS) System 7. SS7/C7 operates over a separate dedicated digital network outside the voice and data carrier lines used to transport subscriber data over the PSTN as shown in Figure 2.6.

**Figure 2.6:** Overview of in-band and out-of-band signalling

Source: http://www.ibiblio.org
In-band signalling

In-band signals are transmitted over each exchange link using the same frequency band as the speech signal or using frequencies out of the speech frequency band. The major problem with in band signalling is its contention with user traffic i.e. speech. Speech and signals share the same frequency bandwidth so only signalling or user traffic can be present at any one point in time.

This option is mainly used in analogue DTMF (Dual Tone Multi Frequency) and loop disconnect transmission links i.e. per line, cable, or trunk. This technology is mainly used on analogue, home telephone lines. For example Calling Line Identification (CLI) on DTMF based subscriber lines have two methods of delivering the required transmission data. This could either be prior or during the ringing post line seizure but take place in association with the ringing process / phase. As a result of the limitations with in-band signalling it has evolved less rapidly than out-of-band signalling which is considered below.

Out-of-band signalling

The limitations of in-band signalling drove the implementation of out of band signalling in the PSTN network. This allows network operators to strip out signalling information from voice traffic and carry it across different time slots or bearers between exchanges and then reconstruct when, and where required i.e. twisted pair home phone line. This speeds up line connection, reduces the bandwidth requirement and in turn reduces the network overheads for network operators.

The introduction of PCM (Pulse Code Modulation) coupled with TDM (Time Division Multiplexing) enabled the separation of signals from the voice path. The signal channels here run parallel with speech signals using different time slots or bearers. Channel Associated Signalling (CAS) helps in transmitting inter-exchange signals directly over a channel associated with speech channels. At the same time CCS enables transmission of the signal over a channel link shared by many channels. The information related to setting up and releasing calls are the same for both, but the formats differ.

In simple terms in-band signalling puts DTMF tones inside the audio stream, while out-of-band interprets the DTMF tones and then converts them into messages carried over signalling protocols such as PSTN to ISDN, H323, and SIP or vice versa.
2.3.3 ISDN signalling

Integrated Services Digital Network (ISDN) is a set of communication standards for simultaneous digital transmission of voice, video, data, and other network services over the traditional circuits of the public switched telephone network.

The previous section identified ISDN as an out-of-band signalling approach which provides a possible method to notify the presence of a network based answering service. An ISDN based approach, together with options for Session Initiation Protocol (SIP) (considered in the next section), is the basis of the methods under discussion by the Network Answer Machine Working Party as described in its minutes of 12th November and 10th December 2012.

The approach under discussion is to propose changes to the ISDN messages to allow the network to inform call centres reliably that the call will be referred to a network based answering service. The preferred option is to seek implementation of a custom progress indicator which would send on the connect message. More recently, the Network AMD Working Party has set out the following options for discussion:

1. On the terminating carrier deciding to put the call through to voicemail, deliver an ISDN PROGRESS message to the calling party with a custom progress indicator information element.
2. On the terminating carrier transferring the call through to voicemail, deliver the CONNECT message to the calling party with a custom progress indicator information element.
3. On the terminating carrier transferring the call through to voicemail, deliver the CONNECT or PROGRESS message with a ‘display’ information element that contains the called party number with a modifier (such as a # character).³

This approach is considered to minimise the inputs needed from operators and hence be more likely to be implemented. Nevertheless it may require updates to the standards and effort on the part of the network operators. The Network AMD Working Party stress that the approach must address the following concerns:

1. Any method proposed must be able to be delivered by carriers using existing network equipment and made by making as few configuration changes as possible.

³ 'Standardised signalling for network answering machines', Garry Pearson, Sytel Limited, Discussion paper circulated to Network AMD Working Party, 15/04/13
2. Any method must be a common signalling option supported by the overwhelming majority of call centre vendor telephony stacks.

3. Any method proposed must not create a material increase in signalling bandwidth required.

4. The proposed method should have a natural translation between Q.931 (ISDN) signalling and SIP signalling.\(^4\)

It is understood that ISDN messages are already used to indicate answer machines to call centres in Germany, but that this uses the call divert message rather than a custom message. This provides a useful improvement in the detection process, but only increases the probability of detecting a network answer service rather than providing a clear cut indication.

### 2.3.4 Converged signalling and next generation networks

The key concepts are common across the different signalling protocols including the two main VoIP protocols, SIP and H323. Signalling System 7 will still play a key role in converged networks for many years to come due to its reliability, resilience and flexibility; and as many networks will be hybrid so will the signalling platforms.

Signalling protocols, and the architecture on which they are run, are responsible for carrying out the process of setting up the phone call. The system uses these protocols to determine the network location of the other party being called, whether the other party can be reached or is out of the network, and helps establish the flow of voice traffic.

**Session Initiation Protocol (SIP)**

SIP is the most common implementation for IP based networks. SIP was created by the Internet Engineering Task Force (IETF) the group which standardises basic IP protocols.

SIP is constructed around a request and response structure, where one side sends a request for action for a particular resource and the other side reports with a response. Every SIP message is in text format, and the goal is to provide a simpler method of signalling between devices. SIP normally runs over User Datagram Protocol (UDP) but Transmission Control Protocol (TCP) is also an option. The SIP

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\(^4\) Standardised signalling for network answering machines, Garry Pearson, Sytel Limited, Discussion paper circulated to Network AMD Working Party, 15/04/13
architecture is shown in Figure 2.7 which is a basic network design showing SIP to PSTN interconnect:

Figure 2.7: A basic SIP architecture

H323

H323 is the International Telecommunication Union (ITU) specification that defines how to establish both signalling and bearer channels. H323 uses H225.0 protocol for call setup signalling which itself is a package that refers to Q.931 for call signalling definition. However the use of H323 protocol for voice traffic is not being widely implemented, and is being mainly utilised for videoconferencing. The network architecture is basically the same as SIP.

2.3.5 Sigtran the link between PSTN & IP networks

SS7/C7 described above is the protocol used for network to network signalling in the PSTN platform and ITU standard Q.931 is also used within ISDN signalling.
The SIP and H.323 VoIP protocols have been specifically designed to assume IP as the underlying transport mechanism. The legacy signalling protocols such as C7 and ISDN have stringent performance and functional requirements that IP platforms did not meet. IETF therefore defined a set of encapsulation methods and end to end protocols to meet the performance and functionality of PSTN and ISDN signalling and to allow inter working between these signalling platforms.

A complete breakdown of the inter working requirements for C7 to IP networks, i.e. the Sigtran protocols, can be found in IETF memo RFC2719 of the network working group, titled 'Framework Architecture for Signalling Transport' (October 1999).

Due to the high quality of service requirements of the PSTN platform, Sigtran also has very high reliability requirements and therefore requires a good network bandwidth to run over. This allows tunnelling of C7 between two PSTN platforms over an IP connection or even over the Internet if required.

### Signalling in mobile wireless networks

With 2G and 3G cellular networks the network operators use SS7/C7 technologies to support their roaming voice traffic. The 3G networks however use IP signalling for data and SS7/C7 for voice. All mobile providers have a database called HLR (Home Location Register) where complete information is kept about each subscriber. This is coupled with VLR (Visitor Location Register) which keeps temporary records for calls who visit from other areas and countries. When mobile phones / subscribers roam, each visited system (parts of the network) exchanges SS7/C7 messages with its home system which also marks the HLR so that it knows where to send calls for its roaming customers.

LTE (Long Term Evolution) and 4G technologies and services use different signalling protocols to provide higher capacity for voice and data traffic. These networks use SIP type protocols.

The cellular network works by actively signalling the network i.e. base station to user device. This, depending on the end devices software can cause issues in its own right, over signalling can overload the network and cause major issues. This should not be confused with data capacity available.
2.3.7 Current interoperability and interconnect work streams

Devices and public networks are increasingly moving towards an IP base capable of supporting more than just data traffic. This process is connected with a long transition period from TDM based to more flexible, bandwidth friendly IP platforms.

A set of interoperability standards are key to robust interconnection and to the interoperability of the UK networks. The NICC (Network Interoperability Consultative Committee) who develop interoperability standards for public communications networks and services within the UK, are currently working on new standards to enhance current interoperability between corporate and residential networks when connecting to NGNs (Next Generation Networks).

The main areas of interest are:
- Active Line Access – defines an architecture and service template for Ethernet services across NGN access networks.
- Next Generation Access (NGA) telephony – standards to allow provision of PSTN like voice services over NGA infrastructure.
- Corporate Networks – Interconnection – NICC will define an interface for connection of an IP PBX, or similar customer equipment (CPE) to NGN, which includes signalling specifications.
- CPE (Customer Premises Equipment) compatibility guidance – which will look into documentation and best practise guidance for operators to minimise failure of voice band date on CPE.

2.3.8 Calling Line Identification

Calling Line Identification (CLI) transmits a calling party's number to the called party's telephone. Although this could enable consumers not to answer unwanted calls, in practice CLIs can be withheld, displayed as international or even spoofed which makes effective screening more difficult. Nevertheless, CLI can present one mechanism to screen calls but issues remain, particularly with international CLI.

Some counties strip out CLI data if calls are being sent internationally and the CLI information may also be invalid or become corrupted en-route which would stop this functionality.

Caller ID/CLI spoofing is the practice of sending false or misleading information to deceive the receiving party and hide the caller’s true identity or call origin. CLI spoofing is also on the rise from other
counrtries dialling the USA and the UK. The main enablers here are cheaper calls (VoIP), lower labour costs and the effect of auto diallers.

CLI can be used as a basis to improve AMD. A BT developed approach to do this is described in Section 2.3.12. It has also been proposed that adding a ‘#’ in front of connected CLI messages could be used on the response to indicate the presence of an answer machine.

2.3.9 International signalling

On international signalling each country will use/run two sets of protocols, one for international signalling at their international node’s STP (Signalling Transfer Point) and one implemented at national level. An international node will therefore require both protocols to be implemented.

This is done so that networks can speak between countries and also speak intra-country when using C7 signalling, a seamless protocol transfer.

This standardisation of signalling system also brings advantages to administration, manufactures and more importantly the end users.

For example, one of the call control protocols used at an international level is ISDN User Part (ISUP) which is specified in ITU Q.767. Any country that wants to connect to/at the international level must conform to this specification.

2.3.10 Network status signalling detection mechanisms

A variety of audible tones are used to signal call status over the network. These were mainly introduced for cosmetic reason to notify the end user of the status of their call. These tones are auto generated by the PSTN equipment to advise the status of the user’s request; they were not designed for machine recognition. Such tones include the following:

- The Special Information Tone (SIT)
- Payphone recognition tone
- Call waiting tone
- Caller waiting tone
- Busy and congestion tone
- Dial tone
- Ringing tone
These are all covered under ITU – T E.180/Q.35 (technical characteristics of tones for telephone services) standards. There is some flexibility in the Special Information Tone (SIT). Its basic use is to indicate a failed call, but frequency and duration of the tone can be varied to indicate to detecting equipment the reason for the failed call.

The ITU does recognise that, with the mixture of analogue and digital networks for a while to come, machine tone recognition will still need to be performed with analogue receivers, but when current networks become a pure digital platform the landscape could change. The network operators will have the freedom to make their own decisions about tones in the purely digital networks, but the ITU have recommended a uniform frequency of 425 Hz for the listed applicable tones above.

Answering machine tones are created by an answering machine at the end of a recorded message to inform the user when to leave a message. This is normally a single pure frequency tone of any audible frequency with differing lengths, but can also consist of multi frequency tones i.e. musical tones as there is no technical standard specification for answer machine tone, this is left to answer machine manufacturers.

2.3.11 Network conclusions

The current PSTN is a powerful interconnected platform which has evolved over the years. From just carrying analogue traffic across copper wires today, switching and signalling is mainly computer controlled with nearly the entire PSTN platform using digital transmission. Signals may deliver voice, video and data traffic and travel over fibre-optic, twisted pair copper cables, microwave links and satellite connections.

The current signalling protocols used within PSTN and mobile networks are:

- SS7/C7
- ISDN
- IP, for example SIP and H323

The weakest link in terms of network signalling for AMD is still the home twisted copper pair telephone line. The standard home phone line does not signal the telephone exchange to identify its presence until a call is made or the handset is lifted, and even then the type of equipment connected such as an answer phone cannot be identified. Making a
connection provides the user access to the PSTN platform and all its functionality; however each time a connection is made (or the line is seized within the exchange) the answer phone signalling the exchange the end user would be charged.

Current signalling options

It is possible that SIT tones or another signalling packet, based around current SS7/C7 or SIP could be used to provide an indication that a network based answer machine is about to respond, but this would require work on the part of the network operator.

Network operators also use out bound telephony services in order to sell their products and services, so in theory a network based answering machine detection mechanism would benefit all parties using these services. The impact on the end subscriber is unclear as NAMD would generate greater call volumes/connections to the end users device, who have not subscribed to a network based answering service.

CLI and opt out options

With the potential development of the BT Detect service however (described below) and the requirement for outbound call centres to pre-register their CLI details prior to using the service, this could make policing any misuse of the service easier to identify by the network operator i.e. this may make companies comply with the current or future rulings due to easier traceability. This in turn could reduce companies causing annoyance to the end user by presenting a valid CLI and, in turn easier to identify the offending out bound telephony centre.

Another network signalling feature which could be implemented is an opt-out mechanism when subscribers are contacted by call centres. An automated, interactive IVR (Interactive Voice Response) system could be used during or prior to a telemarketing call. This could allow the subscriber to push a pre-selected button on their handset, which would signal the network and in turn the call centres data base and the subscriber's number could be removed.

IP signalling options and timelines

Most landline calls are still based on SS7/C7 signalling, but the networks are evolving which enables the use of IP based signalling in UK networks. The timeline for a move to a complete IP base is still unclear but the move will take years for voice traffic across the whole of
the UK. This means a hybrid signalling platform will exist for many years to come within current networks.

Some development will be required for a complete VoIP platform but SIP or its alternatives could be enhanced to offer end to end AMD with the introduction of broadband services for residential consumers, if the market place calls for this functionality. These services are all limited by network distance, if delivered across a copper estate due to the line resistance, which will also extend any time scale to a move to a pure IP signalling platform.

ISDN status

Other signalling standards for example ISDN Q931 & ISUP have been in a care and maintenance state for several years and it is unlikely that any changes would be made as this would require a large investment by the vendors and network operators even if it is technically possible. The majority of ISDN lines are delivered and used by business customers for voice traffic, which basically extends the PSTN platform and some of its digital functionality into the end users premises. Most residential consumers have moved over to broadband services where available which offers greater flexibility and in turn download speeds for data services and limited voice with VoIP technology.

Role of standards bodies

The current network standards are governed by the ITU for Signalling system no.7, ISDN & H323 and the SIP by IETF, any change in requirements in these areas will have to be agreed and tested via these governing bodies. All UK network operators generally comply with these standards to interconnect and speak the same technical network language. These standards however are non-binding so any non critical development does not need to be adopted by the network operators. An agreed standard for Network AMD for example, would not necessarily need to be adopted by the operators if they see no benefit with the new standards. This does not stop any developments or innovation within the current standards for this requirement if a network operator can see a benefit to their customer base.
2.3.12 **Network based detection in practice**

**General**

As described above two call centre systems providers report improved AMD performance in Germany due to the improved standardisation and the D-channel messaging to be found in the ISDN implementations on German Networks. This provides evidence and supports the vendors’ claims that suitable ISDN messaging, should it become available, could be used successfully by call centre equipment in the UK.

**BT Prototype**

BT, at its own cost, has performed some work in the area of AMD with their network based 1571 voice mail service and whilst originally built for internal use it is thought to be potentially usable by any call centre.

A proof of concept development has been completed and installed. This network functionality is currently switched off and sits in a dormant state within BT's PSTN platform. BT would require further work to enable utilisation of this service for an external customer base or even BT internally. This service in theory could be made available to BT Retail and Wholesale customer base.

The service works in conjunction with CLI and IVR which allows call centre personnel to configure the service to their individual requirements and would require call centres to pre-register for the service. The 1571 network based service detects pre-registered CLIs presented to it, and to which associated and predetermined action is taken.

Over 99% of calls presented to the 1571 voice mail service currently arrive as SS7/C7 TDM (Time Division Multiplexing). The development therefore focused on data available within SS7/C7 signalling packets and the generic call handling processes employed by the 1571 service. The service fully supports native SIP and is call type stateful.

Although technically possible for the service to work for UK company call centres based overseas, the issues with CLI information across borders still remain. Accordingly this service would not offer a 100% success rate at an international level with current CLI rules in place, but work in this area is on-going.
2.4 Impact of end user devices

Since 2009 some devices and network services have come to market which provide greater consumer control over the calls they receive and answer. These are not directly linked to AMD, but can help to mitigate the effects of AMD failure, albeit at the consumer’s expense. These provide services such as:

- Blocking all unidentified calls
- Blocking all international calls
- Only allowing pre-identified numbers, giving them a different ring or requesting identification before they are put through.

The physical products, ie those that are not network services, have their own answer machine built into them and need to be configured to pre-empt any network answer services such as 1571 which may remain in operation. From the perspective of AMD therefore, they are much like other answer machine services, albeit with lower probability of being answered by a live person, due to call screening.

Devices are available from a number of providers including UK Data IT, CPR, TrueCall and BT. These products provide valuable protection and control for consumers though each costs between about £40 and £100 and so the majority of consumers will still require regulatory protection as before.

Two of the most prominent devices, TrueCall and BT 6500 are described below. In both cases their primary purpose is not just to screen silent calls, but to screen all unwanted calls. TrueCall’s call pre-screening service is more intrusive but would screen out all silent calls. The BT 6500 would not screen silent calls in the case where the CLI number is provided and not specifically barred by the user. The user would be able to see the call record and add it to the block list, but this would require them to switch off the type based screening.

Both of these products provide valuable protection and control for consumers though each costs approaching £100 and so the majority of consumers will still require regulatory protection as before.

**TrueCall**

The TrueCall Call Blocker which originated in late 2008 / 2009 screens calls and requests identification before putting calls through. It has a
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number of profiles which determine the calls put through and the level of screening applied. These are:

- **Standard profile**: asks callers not on the ‘star’ list to identify themselves before they are put through with an introductory message to the called party (known as ‘whisper’). There is also a ‘zap’ list of those asked not to call back again;
- **Secure profile**: similar to standard profile but asks callers to press a key to get through. The aim is to avoid calls which would otherwise revert to a recorded message;
- **International block profile**: Blocks international calls but request a 2 digit code from wanted callers who have been given the selected code;
- **Lock down profile**: Only pre-defined callers can get through. All others are referred to an answer machine.
- **Custom profile**: user selected handling of each call type.

TrueCall ‘works best’ with CLI and consequently relies on this information being available and correct. Without CLI, all calls are treated as unknown and callers are asked to identify themselves.

The service will only put through unknown calls if the caller is prepared to provide their name. If they do not, or the call is silent, no ring is put through to the called party.

**BT6500**

The BT6500 is a recently released product which is marketed as ‘The new phone that helps you block nuisance calls’. It is a standard DECT type cordless phone with an answer machine built into the master unit. The answering machine has visual access which allows the user to check the list of entries and to prioritise which ones they review. This is helpful in avoiding the need to check unsolicited messages.

The system can block calls in one of two ways, but not both simultaneously:

- **By type.** Here the categories which may be blocked are International, Withheld, No Caller ID and Payphone. Each of these types can be blocked or allowed. If the call is blocked the phone will not ring and the caller is referred to the built in answer machine. With type based blocking, the caller is allowed to leave a message.
- **By number.** In this case a list of up to 10 specific numbers can be blocked. With this option the caller is not permitted to leave a message.
In terms of the phone setup, a few points are of interest:

- A CLI subscription is necessary.
- The answer machine gap must be set up to be shorter than the 1571 interval so that it can cut in beforehand (if the 1571 service is retained).
- According to the user guide, the system only works fully with its own handset type, i.e. other BT 6500 units. This means that to get the full level of protection, users need to replace all existing handsets. If they do not, the older handsets will still ring and disturb them. This is significant insofar as it increases the effective cost of the system and may hence limit takeup.

The most likely use of the system is likely to be to bar calls by type, particularly by international and withheld. The fact that calls are still put through to the answer machine means that messages can be followed up where the calls were wanted. The main disadvantage would be that urgent international or withheld calls are also screened.

This type of device helps to give some control back to the user. It is not fool proof in that CLI spoofing to a UK number would still get through but user reviews and personal testimonies suggest that at present it provides a useful service.

Network services

BT provides the ‘Anonymous Call Reject’ service for £13.50 per quarter\(^5\), though this service does not cover international numbers without valid Caller ID. BT also offers a service known as ‘Choose to Refuse’ which will reject up to 10 numbers with the same caveat on international numbers. This service is £11.10 per quarter\(^5\). These services are ‘Advanced Network Calling Features’ and so are not available as part of the discounted BT Calling Feature Packs\(^5\). To have both would cost £98.40 per year without any control of international calls. Virgin Media offer the ‘Anonymous Caller rejection’ service for £2.70 per month\(^6\). As with BT, Virgin do not off this as part of a package and add the caveat that ‘Anonymous Caller Rejection will only prevent calls from withheld numbers; it will not withhold numbers that are unknown (e.g. calls from abroad)’.

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\(^5\) BT Tariff Guide for Residential Customers, 28th September, 2013

\(^6\) Virgin Media ‘Calls from home residential tariffs’, Prices effective from 1\(^\text{st}\) March, 2013
[http://store.virginmedia.com/content/dam/eSales/Downloads/010313%20Residential%20Cable%20V1.pdf](http://store.virginmedia.com/content/dam/eSales/Downloads/010313%20Residential%20Cable%20V1.pdf)
Silent Callgard

Outbound calling is performed for a variety of reasons which include Sales and Marketing, Debt Recovery and information provision to existing customers. The official TPS service provides a method for consumers to register not to receive unsolicited Sales and Marketing calls however calls from organisations where a pre-existing relationship is in place are unaffected by this. Silent calls resulting from incorrect AMD or other facets of predictive diallers may, of course arise as a result of calls from any outbound call centre operator and may be from organisations that the subscriber does wish to speak to or that have a legitimate need to speak to the subscriber.

About 10 years ago an additional service was set up to assist consumers who were troubled by silent calls. The service is known as Silent Callgard and is operated by UK Data IT7. Although provided as a commercial product, the service was initially backed by the DMA and OFTél with free to attend promotional events for the Call Centre industry and at first, registration with the service was routinely suggested by the Telecommunication Operators’ nuisance call bureaux. Although no longer associated with the TPS, registration with the service was, and remains, free for the consumer and call centre operators can obtain the file, and applicable weekly updates for free too. Organisations can then use the file to ensure that calls to the numbers on the list are only made with diallers in progressive rather than predictive mode, and without the use of AMD. This or a similar service could be a valuable means to protect consumers burdened by silent calls from all sources not just those unsolicited marketing calls covered by the TPS service however the usage of the service has declined and registrations now stand at about 200-300 per day, equating to a rolling total of about 90,000, compared to a base of 1 million in the years following the launch. Registration for the service expires after 12 months and the subscriber must register to continue to be on the list. The take up by the call centre industry is unclear and knowledge of the availability of the service was extremely low during our research. If the service was widely used there are clear benefits not only for consumers, but also for the call centre operators. In the case that a subscriber’s greeting is repeatedly wrongly detected as that of an answer device, the call centre can use this list to not only reduce the risk of complaints from subscriber but also to assist them to contact the subscriber effectively to deliver their message.

7 http://www.ukdatait.co.uk/silent.html
3  Consequences for consumers

3.1  AMD impacts

It is widely acknowledged that AMD using the cadence method has the potential to be a significant driver behind the receipt of silent calls by consumers. Ofcom has sought by use of its regulatory and enforcement powers to minimise the incidence of silent calls generated as a result of AMD. The current regulation acts in two key areas to influence the consumer experience:

1. The inclusion of a reasoned estimate for False Positives generated by AMD in the call abandonment rate; and
2. The requirement to play a very brief recorded information message no later than two seconds after the telephone has been picked up for abandoned calls.

The first of these principles in general acts to minimise the use of AMD and thus generation of silent calls to consumers. The second means that call centre operators have only 2 seconds to detect if a call has been answered by a live person or by an answer machine. This has an effect on the accuracy of detection using the cadence method. However the period of silence whilst cadence based AMD is carried out by the call centre system, also has the effect of injecting a pause at the start of a call which, as consumers become more aware, alerts them to the likelihood that the call they have answered originated from a call centre. This can have negative implications for relations between the call centre and the consumer that is not helpful for either party.

If future AMD only operated to classify calls as about to be answered by an answer machine when this could be guaranteed by reference to information passed from the network either in-band as a tone or out of band as part of the signalling for the call set up, and all other calls were passed to live agents (where available), then silent calls produced as a result of false positives would theoretically be eliminated. The consumer would also not experience the pause at the start of a call unless generated as a consequence of aggression settings used when dialling in predictive mode.

3.2  Research undertaken with consumer organisations

As part of this study, interviews were sought with consumer organisations and were undertaken with representatives of the Consumer Forum for Communications and the Communications Consumer Panel as well as interested individuals, Mr Steve Smith and
Mr David Hickson. During the interviews, feedback was provided both on AMD related issues and also concerning other issues of nuisance calls, of which Ofcom has been made aware.

Interviewees were asked about the drivers behind silent calls and responses indicated they did believe AMD was to some degree responsible for these as it is clear from how the technology works that it could cause an issue but that it is unclear to what extent. Respondents pointed out that many large operators have turned AMD off but it is unclear how this reflects in Silent call numbers which are still rising.

Two other lines of thought were offered in response to this area. The first was regarding other factors that could produce silent calls – Steve Smith offered the view that an important driver that is often ignored is the propensity for cordless and similar phones to continue ringing after the calling party has disconnected. Steve believes the influence of this factor is borne out by the low numbers of silent calls he understands are reported to mobile phones. It was also proffered that some calls could be reported because the tolerance of the public to call centre calls has diminished and the pause for AMD or the dialler to find an agent could lead to the consumer swiftly hanging up and reporting of a silent call.

The second line of thought relating to this area was in relation to the statistics for silent calls. Interviewees believed that these were unlikely to be an accurate reflection of reality due to user perception of what constitutes a silent call varying considerably and also the feeling that not all silent calls are captured in the figures with many not being reported and some possibly being categorized as something else during the reporting process leading to them not being included.

The following line of enquiry that the interviewees were asked about was whether Silent calls remain a significant focus of consumer concern or if the focus has moved over the last few years. General opinion was that although other nuisance calls have risen in their importance and automated or robocalls may now be the most burning area of concern, silent calls are still of significant concern for consumers. When considering the importance of this issue it was noted that it is important to take into account the very large dispersed cost to consumers and that the cost of Silent calls is not the same for all consumers and there are 3 groups particularly affected.

1. People with a nervous disposition
2. People with a disability who find answering the phone more of a burden – in many cases this is not a negligible burden.
3. People who work from home where calls are disruptive to their productivity.

Interviewees passed comment on the effectiveness of the TPS service at protecting consumers from unwanted calls and it was generally judged to be of valuable but limited benefit. In particular it was felt to be becoming increasingly irrelevant due to consumers completing details on e-forms which give the companies permission to call.

There was limited awareness of the Silent Callgard service. The limited feedback provided contained a sceptical opinion of the benefits.

Interviewees were asked to comment on the effect of call blocking devices on the consumer experience. Generally these were felt to be a welcome addition to the tools available to consumers however there was much concern expressed that vulnerable consumers who may also be economically disadvantaged may not be able to access these devices and services due to the cost implications. There was also a concern expressed that they could hamper the receipt of legitimate calls.

Interviewees were questioned about their views of regulation to reduce false positives and possibly the use of Non network AMD. The view was that advances in this area would be welcomed by consumers but there was a recognition of the needs of the call centre industry if it is to remain viable and also the need to give consideration to price rises or possible reduction in quality of products or services that might result.

3.3 Relative impact of non AMD issues

As described above, it must be remembered that there are many other factors which could produce silent, abandoned or nuisance calls and in turn affect the consumer’s welfare to a greater or lesser extent. It should also be noted that the combined effect of all types of unwanted calls for many consumers is to make their fixed line almost unusable for genuine inbound calls. This is because consumers simply start to ignore calls.

The following are examples of key factors that could influence the consumer’s perception of silent or unwanted calling but would not be attributable to the use of AMD:

- There may be a tendency for call centre agents to generate abandoned calls intentionally, for example to raise work figures on call volume by abandoning calls.
Erroneous calls which were supposed to be destined for fax machines would generate calls without human speech when answered by the subscriber.

Calls from companies who are not constrained by the TPS (Telephone Preference Service) list due to a particular consumer having consented to receive calls as part of completing a form in previous dealings with the company concerning products or services from either the calling organisation or a partner organisation with whom they share data.

Calling organisations may be able to bypass call blocking devices and services by providing an unfamiliar CLI or one that is not their own (CLI Spoofing).

Nuisance calling could be exacerbated by the use of out of date or incorrect data lists by organisations using equipment such as auto diallers, thus generating calls to inappropriate recipients who are not interested in a product or service or who have registered not to receive marketing calls via the TPS.

Consumers’ wireless telephones can create the perception of silent calls when they continue to ring after the caller has terminated the call.

It is also possible for annoyance to be caused by voice blasting (playing of a recorded message) to high volumes of consumers from call centres. This is also known as ‘robocalls’.

3.4 Use of call blocking equipment

It could be suggested that the use of devices such as those described in Section 2.4 above may provide an alternative to regulation such that control is passed to the consumer in a similar way to the use of Firewalls on a computer. However an important difference that must be noted is that a computer firewall can screen communications based on a broader range of information as it has access to the message content as well as the source and destination information. As such the call blocking devices and techniques are a somewhat blunt instrument in comparison to their firewall counterparts and can also have undesirable consequences for permission based calls, such as those from existing banks or insurance companies advising of product expiry etc.

These devices also act to push the responsibility and cost to the consumer which is not seen as desirable by consumer groups representing vulnerable groups of society.
It should also be noted that these devices also contain a non-network messaging service answer device and so a growth in the penetration of these would reduce the effectiveness and benefits of any future Network based answer machine detection. It must be mentioned however that the total number of units in use is reasonably estimated to be about 100,000 thus a very small proportion of UK consumers currently choose to make use of such devices.

3.5 Usage dynamics

In addition to the technology changes noted in Chapter 2, there have also been changes in the relative proportions of devices and systems in use. Areas in which such changes may have occurred between 2009 and present include the following:

- Proportions of landline, mobile and VoIP voice phones in use
- Proportions of network vs physical Answering Machines used
- The availability and use of other services such as Caller ID
- The progressive impact of regulations affecting AMD use
- The consumer response.

Since 2009 there has been a continued general shift towards mobile phone use as shown in Figure 3.1. This is significant because it implies a corresponding shift of calls towards mobiles which have a different answer machine profile.

Figure 3.1: Household penetration of fixed and mobile telephony

Source: Ofcom 2012

Figure 3.1 shows that the number of mobile only households has grown from 11% in 2009 to 15% in 2012. During the same period, the number of fixed line only households has dropped from 7% to 5%. The proportion of adults who personally own/use a mobile phone in the UK as of Q1 2012 was 92%.
Regarding the balance of use of fixed and mobile devices, Figure 3.2 shows that in the 2009 to 2011 period, mobiles surpassed fixed lines in terms of total minutes of use.

Figure 3.2: Trends in the use of fixed and mobile telephony

![Graph showing trends in fixed and mobile telephony](image)

Source: Ofcom Communications Market Report 2012

While mobile minutes have started to plateau, fixed line minutes have continued to fall. This is partly explained by the fact noted by Ofcom that "text-based communications are surpassing traditional phone calls or meeting face to face as the most frequent ways of keeping in touch for UK adults." It should also be noted that VoIP use is becoming more significant as shown in Figure 3.3 which highlights the age profiles.

Figure 3.3: Use of fixed voice services in the home

![Bar chart showing proportion of respondents using fixed voice services](image)

Source: Ofcom Communications Market Report 2012
These developments imply that the AMD issue is increasingly related to mobile devices and the interviews supported this trend. One interview comment was that 70% of calls are going to mobile devices in some cases. This has the following implications:

- Mobiles use network based answering systems exclusively;
- Mobile also provide built in facilities and apps that can make blocking calls easier,

Although there has been a shift to mobile and hence a change in some of the priorities for AMD, the issues addressed in 2009 remain relevant. In particular, the increasing relative age profile for land line use means that the inconveniences of silent calls are increasingly concentrated on older people.
4 Industry Context

4.1 Regulatory background for call centre operators

Call centre operators currently work in an environment regulated by a number of different authorities including the Information Commissioner’s Office, The Ministry of Justice as well as Ofcom. Ofcom is responsible for the aspects relating to the use of the communications networks and the persistent origination of silent or abandoned calls can result in investigation enforcement and penalty procedures under the Communication Act 2003. Ofcom issued a revised statement of policy on the persistent misuse of an electronic communications network or service in 2010 which updated the statements issued in 2008 and 2006.

The revised statement provided clarity around the use of Answer Machine Detection (AMD) by Automated Calling Systems (ACS). Ofcom worded the statement to seek a balance between minimising consumer annoyance and distress and providing scope for innovation and efficiencies in the call-centre industry. As such the use of AMD was not banned but parameters around its acceptable use were specified. This is because inaccuracy of detection means some calls answered by live consumers are incorrectly classified as being answered by answer machines. These calls are known as false positives.

For consumers false positive calls result in dropped or most likely silent calls. However because the call centre systems have classified these as being picked up by an answer machine, they are not, by definition, treated as other abandoned calls produced as a result of predictive dialling and agent availability. This means they will not be played a message or included in any unadjusted count of abandoned calls. Ofcom’s Statement of Policy states that the users of AMD must include a reasoned estimate of false positives when calculating the abandoned call rate. This is on the premise that FPs are abandoned calls and must be treated as such.

4.2 Call centre operator choices in the current AMD environment

A wide variety of organisations operate outbound call centres in order to further their business objectives. Some organisations run their own in-house call centres and others out-source the operation to businesses dedicated to operating call centres for others. The way a call centre measures its productivity will be dependent on the particular operation but may include measures for calls made, number of live connections...
made, sales made, amounts recovered, cost of sales etc. Despite this variation the Call centre Agents’ time is a valuable resource in any call centre and operators will seek to make the best use of this. Overall the cost of the Agent time will be reflected in the cost of the products and services offered to consumers, whether this is home improvement products, the cost of credit, or the cost of financial products such as insurance for new or existing customers. Many call centres view AMD as a method to reduce agent time required and thus increase productivity of the call centre operation.

Figure 4.1: Factors influencing the decision to use AMD

The above diagram illustrates the competing factors influencing the choices of the call centre operators in deciding whether to use AMD.

Although there may be an initial perception that there are gains to be made in terms of agent productivity and morale, there are also a number of often more subtle factors that may cause a call centre to decide not to use AMD. The advice from technology vendors is mainly that, where AMD is using a form of the cadence method, it will not be possible to operate within the 3% abandoned calls in the Ofcom Statement of Policy and thus the safest option for operators is to turn it off. In order to maintain compliance with regulation we believe many call centre operators have indeed been prompted to switch off AMD for some or all campaigns. As part of this study a survey was conducted with the help of Call Centre Helper (www.callcentrehelper.com). Although the response was limited with only 5 responses received relating to the current use of AMD, 4 of those responses indicated that
AMD was not used. The respondents indicated they were working in dialler or operations management roles.

Turning AMD off has led to some interesting results being reported by call centres. In particular LBM conducted a trial to evaluate the overall usefulness of AMD in driving agent productivity and found that productivity was raised when AMD was turned off.\(^8\)

It should be noted that the current Ofcom Statement of Policy allows the measurement of the 3% abandoned call rate across a campaign or a call centre. The statistics for the entire call centre operation can then be reported and will be favourably influenced by the campaigns where AMD is not used. The choice of whether to use AMD on a particular campaign can be the result of the quality of the data on the calling list. Where data is of good quality, for example, in terms of inclusion of a proven best time of day for contact of a particular individual, then the incidence of agents encountering answer devices can be significantly reduced.

### 4.3 Views from the credit services sector

As part of this study comment was invited from the Credit Services Association (CSA) which is the National Association in the UK for companies active in relation to unpaid credit accounts, debt recovery agencies, tracing and allied professional services. Respondents were asked if they currently used AMD and replies indicated a mixed viewpoint where some companies use it as they believe it increases customer satisfaction and contact rates however others indicated nervousness about maintaining compliance with the Ofcom Statement of Policy and one stated they believed the ‘Surest way to prevent consumer detriment is to turn AMD OFF’. Respondents were then asked how important was AMD considered to be by their contact centre. Again there was a range of views expressed ranging from AMD not being important as the organisation concerned wished to ensure a positive customer experience through to AMD being crucial to get the best from campaigns. The Credit Services companies did report that they all left messages on answer devices some manually and some using automated messaging. When asked whether the current Ofcom regulation regarding AMD use is clear for operators, and whether it produces the required outcomes, opinions expressed were generally positive and it was felt the Ofcom Statement of Policy does promote the

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desired outcomes however one respondent did note that OFCOM should work with technology suppliers to provide a clear structure as to how they believe false positives should be calculated and thereby remove current uncertainty in this area. The general view was that reducing the 3% down even further would have a significantly detrimental effect on the industry approach as a whole and penalise those who already comply. If the 3% was lowered to 1% the view expressed was that this would be difficult to achieve even without AMD technology, and the use of 0% would be unrealistic as there is always the likelihood of technological failure, e.g. failure of phone lines and even where live agents are used to identify answer machines they do occasionally make mistakes.

There was a view expressed that Network AMD sounded like an excellent solution although it would have to be cost effective to implement. It was felt there were obvious benefits in that it would eliminate uncertainty and customer detriment and would enable businesses to manage their telephony processes better. However there was a view expressed that implementation could significantly reduce the number of suppliers to the market and may also hinder the use of the many technological advances currently available. There was also a concern expressed that banning the use of non-network AMD could have an impact on productivity because of the increased number of calls answered by non-network answer devices which would necessarily be put through to agents.

Respondents were keen to point out that not all outbound calling is sales related and that although consumer choice makes sense for managing the receipt of marketing calls, from the credit service industry perspective, calls are not in relation to trying to sell something, but companies need to speak with consumers to recover outstanding monies which they agreed to pay at the time of spending. Although circumstances may have changed, the discussion regarding repayment needs to take place. It is crucial therefore that all call centre contact is not viewed as being of a sales nature. Consumer call blocking technologies may encourage some consumers to avoid important contact calls, which are made in the consumer’s interest, and call blocking could make legitimate attempts to contact consumers more difficult, thus increasing letter and other costs incurred by the organisations in relation to debt recovery.
4.4 The view of the Direct Marketing Association (DMA)

Another avenue of research involved seeking comment from the Direct Marketing Association (DMA) who were established in 1992 with a remit to provide leadership for the direct marketing industry. The DMA has more than 1,000 members across the UK, including agencies, list brokers and mailing houses, as well as blue-chip corporations such as BT, Sainsbury's and Lloyds TSB.

The DMA expressed the opinion that it is undeniable that AMD causes silent calls through false positives. However, it felt that it is not clear that this makes it the major driver. Many operators have stopped using AMD but the number of reported silent calls has still risen sharply suggesting that other factors are at work.

The DMA response pointed out that although larger call centres generate more of everything and thus tend to stand out when simple counts are used to assess what it happening, it is quite possible for a smallish call centre run badly to have a similar nuisance footprint to a large centre run well.

The DMA also expressed a view that AMD was a useful tool for the industry without other detrimental effects. In fact in environments where agents receive many answering machines before getting a live call, the DMA felt that agents themselves may become hasty in their assessment of whether a call has connected to an answer device and this could also lead to mistakenly cutting off calls to live individuals.

When asked to comment on the choices for the consumer in terms of devices and how these influence the experience regarding calls from contact centres from the user perspective the DMA response expressed the view that consumers have used answering machines to screen calls for many years; however the newer call blocking devices add some intelligence to this process, which may improve the experience for some consumers. However they also drew attention to drawbacks of this type of device. For example blocking calls when a CLI is not passed will stop rogue calls, but may also affect calls where the CLI is withheld or lost for legitimate reasons e.g. Doctors not wishing patients to have their mobile numbers. Also when no message is left the person being called cannot know whether the call would have been interesting to them. Some call centres choose to leave messages, but many don’t because they want to perform verification checks about who they are speaking to before imparting any information.
The DMA response acknowledged that different ‘flavours’ of AMD have different accuracy rates and that even with a specific technology accuracy rates may vary depending on local conditions.

The DMA felt that while technology in the area of AMD has remained fairly stable, there have been some recent advances, tending to focus on specific areas, in particular how to detect network based voicemail systems. It was noted that the current work (see Section 2.3.3 above) being done to try to create a standard for networks to indicate when calls are being passed to voicemail should, if successful, go a long way to removing the need for other AMD technologies.

When asked to comment on the drivers behind any call centre systems evolution in this area the DMA expressed the view that generally it is the drive for efficiency and a consumer demand for low costs that drives this kind of change because detecting answering machines before they go to agents will have an effect in lowering costs. However, it was acknowledged that false positives also impose costs because a live conversation is missed. Call Centres can work to minimise the number of answering machines they call by better use of data analytics, but it is impossible to do this perfectly, so answering machines will always be encountered. Most call centres want to balance the overall efficiency by using technology where possible without ‘wasting’ calls. Accurate AMD helps in this regard.

The DMA was asked how important AMD is considered by contact centre operators and it expressed the opinion that if AMD that can be safely used within the regulations is available then it is fair to assume that most call centres will use it. It was however also stated that many call centres have stopped using AMD, and some have reported limited loss of, or even an increase in efficiency. However it is not completely clear where the efficiency gains came from because many centres improved their overall data analytics and other processes when AMD was switched off. Since AMD accuracy varies by technology it is also possible that those that have seen limited loss of efficiency were not using optimal technology beforehand.

The DMA further provided the opinion that debt recovery operations tend to see lower contact rates than other applications and are therefore more affected by the loss of AMD.

When asked about the current regulation the DMA responded that while the rules are fairly clear there is still some lack of understanding in the
marketplace which could be improved by better dialogue between Ofcom and the operators.

The DMA expressed the view that banning AMD is unlikely to have a large effect on silent calls because many companies have already ceased using AMD but silent calls continue to rise. In the opinion of the DMA this means that either the silent calls result from other causes, which will not be affected by the ban, or alternatively if some organisations are simply ignoring the dialling rules strengthening these is unlikely to cause these companies to change their behaviours.

Reducing the guidelines in the Ofcom Statement of Policy regarding the number of abandoned calls was felt by the DMA to be likely to have implications wider than AMD. It was felt it could affect the use of predictive diallers which could have a devastating effect on call centres that would be faced with a large increase in costs to employ more agents.

The DMA suggested working with existing rules rather than restricting the use of this technique, which they feel has a lot of beneficial uses. Making the rules tighter adversely affects those who choose to work within the law but does not impact law breakers.

The DMA offered positive comment that Ofcom’s current initiatives offer the possibility of better understanding the overall calling environment including properly establishing the causes of silent calls and took the opportunity to provide broader feedback, of which Ofcom has been advised.

4.5 **Barriers and enablers to take up of AMD technology**

This section considers factors that could facilitate or inhibit the takeup of developments giving rise to improvements in AMD. Consideration is given to the types and sizes of operation and the different business models in place and if these differences affect the decision making process.

Issues discussed in the previous report will be examined to see if they have changed in the intervening period and a reassessment to uncover any new barriers will also be undertaken. Issues are seen to fall into four main categories which are now considered in turn.
Cost

Call Centre Operators see no significant add on cost for most diallers because AMD is offered as part of the main dialler package in many cases. During our discussions they expressed the view that they would not see an issue with adopting new technologies as they would expect them to continue to be offered as part of the technology they are supplied with. However if use of the new technology required them to pay an extra charge to their chosen network provider for provision of the signalling to enable the technology to work in their Call centre then they became more cautious about adoption.

Operations costs due to the potentially less efficient use of agents' time can arise from the non-use of AMD. In many cases, however, this must be considered as a bearable cost because many centres are not using AMD. As noted above comments were received that some operators actually experience an increase in productivity when ceasing to using AMD.

In the wider context one of the key barriers inhibiting the adoption of improvements is the value chain that is in place to support improvements. In order for a signalling based approach to detection of Network answer devices to be feasible, the Network providers must commit investment into provision of the signal to the call centres. The same Network providers would, if the facility was adopted, see a decrease in revenues due to a drop in call connects from the call centres. As no network operators in the UK currently offer this facility there would be no competitive advantage to be gained either for an operator taking this forward. We would also perceive little appetite from consumers to foot the bill as part of the provision of the answer service as these are provided as part of wider packages of services which exist in a competitive marketplace. Thus Network Operators would need to invest in a service despite it being unlikely that they would see an obvious positive return from this.

Human factors

One of the advantages identified for AMD was to improve the morale of call centre staff. Morale can become very low when the agent reaches nothing but answering machines. This appears to be an issue for centres calling with more limited customer data that are less able to target effectively.
Although AMD can reduce pressure on agents, it must be balanced against the view that AMD can irritate customers so that they may be less well disposed when the agent does finally reach them. A time lag can be a function of dialling in predictive mode without AMD enabled although this can be managed for the most part by changes to the aggressiveness of the dialler settings.

An interesting development is that in many cases it has been observed that not using AMD encourages call centres to improve their contact profiling and hence achieve better contact rate results in this way. The use of AMD can be a sign that the centre is working with poor quality data.

Technological

Obtaining AMD technology does not constitute a barrier to its usage as it is generally provided as an option on dialler systems sold to call centres and is often included as part of the basic dialler package. The call centre therefore has the option to use the AMD or to switch it off. In addition on most systems the call centre also has the option to adjust the ‘aggression’ of the system as discussed in Section 2.1.1 and Figure 2.3. By making such adjustments it is possible for the centre to reduce the number of false positives at this can be at the expense of more false negatives where calls that have been answered by an answer device are connected to an agent.

Testing performed on systems with AMD shows considerable variations. The outcomes range from ‘continued use is OK’ through to recommendation to switch off the AMD immediately. System types vary and some are still considered usable. It is also notable that considerable discrepancies have been observed between tests in controlled environments which may show results as good as 99% compared with tests in an operational environment which may be as low as 75% accurate. Based on this, there is a general recommendation from technology vendors that AMD should be switched off as the default condition. This is backed up by tests which compare AMD on and off in a similar environment. One comment was that ‘hardly anyone is using AMD now’, though requests to test AMD are still received by consultants working in this area so there is evidence of continued, if more limited use and this is backed up by our research.

As described in section 2 above, two of the technology vendors interviewed were using methodologies in advance of the cadence
method in the UK market place. One was coupling a network based method with the cadence based method to drive up accuracy rates and the other was solely using the bit pattern recognition method to accurately detect known greetings. The latter provider commented that call centre operators using his technology complained that, although no false positives occurred, many more answer devices were passed to agents when compared with the use of a traditional cadence method. Thus adoption of new methodologies such as bit pattern matching that may offer accurate detection but of a lower percentage of answer devices may be inhibited by competing in the technology marketplace with the legacy cadence based solutions. Where a more advanced methodology can be used as a primary means with the cadence method with low sensitivity settings as a secondary method, it is possible that the disadvantages could be avoided whilst still decreasing false positive rates.

Regulatory

Another factor which has been noted is uncertainty over how to implement the Ofcom Statement of Policy. The targets themselves are clear, but there is no prescribed means of testing. Call centre operators are often discouraged from using AMD because of the burden of demonstrating compliance. Discussion and guidance about, for example, what level of temporal sampling is needed would be helpful so that an acceptable testing regime can be implemented with an optimised level of resources. It was also noted that it may be helpful to make it clear to call centre operators that engaging in dialogue with Ofcom will not influence initiation of enforcement procedures against their organisation as this appears to be a concern for some.

From the call centre side, users are keen to see the implementation of network AMD but recognise that network operators would not choose to implement the necessary changes because of the costs involved. Many in the call centre industry go on to suggest that there could be a role for a regulator to act as an enabler to specify and enforce requirements for provision of the supporting technologies for network AMD on the UK network operators. Thus Network Operators would need to invest in a service despite it being unlikely that they would see an obvious positive return from this.
5  Conclusions and next steps

5.1  Technology conclusion

There have been advances in AMD technology at the call centre level, but these are unlikely to raise accuracy to a level that would enable call centres to keep within the 3% abandoned call rate in Ofcom’s Statement of Policy. The bit pattern recognition approach improves the detection of standard network voicemail services with standard responses and will give very high levels of accuracy with these cases. Personalised greetings and non network answer phones remain more difficult to detect and these will still dilute the overall accuracies which are still likely to be too low. If these non standard responses are routed to agents however, this approach is a possible way forward if AMD is to be used. This could be useful for the specific cases where AMD is seen as more important, such as in debt collection.

Full network AMD, where the dialler would be informed of the customer status directly by a network message, is a highly favoured solution. Nevertheless there is no evidence that it is currently available in the UK or likely to be in the short term. The possible approaches to signal an impending voicemail response include the use of the ISDN D-Channel, the use of customised SIT tones and a network service based on the availability of pre-registered CLI information from a call centre. The first of these is in use in Germany but not in the UK where it is not clear consistent implementation across all operators will be possible. The use of custom SIT tones would require operator investment and this would need to be recouped, probably from a paid service to call centres. Similarly the CLI approach has been developed in prototype form by BT, but again this would only be implemented as a service if a suitable business case can be found.

It is therefore possible that network services could be provided by network operators, but since call centres would be the main beneficiaries it is unlikely that the operators would implement this type of system without the prospect of recompense.

Overall, the views of recent advances were that:

- Generally that there is no significant improvement in AMD performance compared to provision in 2009;
- Network AMD is seen as potentially a valuable method, but it is not in use at present and it is not clear if it will ever emerge as a practical and economic approach.
- A common view was that current ‘cadence’ based AMD has gone as far as it can and is still not helpful in most cases.
AMD does remain in use for some specific applications such as debt collection. Here callers are keen to leave a message even if the contact is not present.

5.2 Approaches to addressing the issue

A key point that arose during the study questioned the accuracy of silent call reporting statistics and whether the key driver for silent calls remains AMD generated false positives. It is important to establish this since any changes to address the incidence of silent calls may not have the desired effect if another factor is really behind these calls. A key element prompting this concern is the seeming rise in silent calls year on year despite the finding that large call centre operators are ceasing to utilise AMD technology extensively in their operations.

It could be said that for an issue such as this there are three main approaches to the problem:

- Firstly a hands-off approach could be taken, leaving the issue with the consumer to source devices and services to protect themselves. Although useful tools are available to the consumer this is unlikely to provide a sufficient resolution to the issue for the reasons described above.
- Secondly an approach similar to TPS could be used so that the industry polices its own calling. Promotion and reinforcement of a service such as Silent Callgard falls into this category and could offer a way forward by offering an opt-out for consumers. However mandating the use of such a service may raise its own issues and difficulties in a similar way to the current TPS.
- The third approach is to work on amending the Statement of Policy that industry must adhere to in order to avoid enforcement action and the risk of fines. This is discussed below.

A common industry view of the current Ofcom Statement of Policy is that while it is sensible, it is difficult to meet the specifications reliably because appropriate testing methods and practices are not clearly defined. This has the benefit for consumers that many call centres err on the side of caution and keep the AMD switched off.

Discussions with vendors and consultants providing testing services indicate that most call centres operating at present do not use the AMD on the diallers. This is partly because of the need to comply with the Ofcom regulations, but also because it is increasingly seen as better customer relations to operate in this way. Further, working without
AMD encourages better working practices such as the demographic profiling which help to improve call timing and targeting and hence make the call centre more productive in a different way.

A ban on the use of non network AMD could be implemented as many operators are working without it in any case. There are some additional considerations here however:

- Technology specific regulations could prevent future innovation in the cadence method.
- Non network AMD would be defined with respect to Network based AMs, ie detection of these on land lines and mobiles.
- 'Full network’ AMD is not evident as an imminent option to provide an alternative.
Appendix A. Appendices

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## Appendix A. Glossary

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Appendix B. List of contributors to research

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<tr>
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<th>Company</th>
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<td>Other</td>
<td>UK Data IT - operator of Silent Callgard Service</td>
<td>Richard Melling</td>
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